

T.C.
YEDITEPE UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
DEPARTMENT OF NUTRITION AND DIETETICS

**THE RELATIONSHIP OF FOOD CRAVING WITH
BODY MASS INDEX, EATING ATTITUDE AND
NUTRITION KNOWLEDGE LEVEL AMONG
STUDENTS: A FOUNDATION UNIVERSITY SAMPLE**

MASTER THESIS

SENEM YUMUŐAK

ISTANBUL-2024

T.C.
YEDITEPE UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
DEPARTMENT OF NUTRITION AND DIETETICS

**THE RELATIONSHIP OF FOOD CRAVING WITH
BODY MASS INDEX, EATING ATTITUDE AND
NUTRITION KNOWLEDGE LEVEL AMONG
STUDENTS: A FOUNDATION UNIVERSITY SAMPLE**

MASTER THESIS

SENEM YUMUSAK

SUPERVISOR
Associate Prof. Dr. Irem KAYA CEBIOGLU
ISTANBUL-2024

THESIS APPROVAL

Institute: Yeditepe University Institute of Health Sciences

Programme: Nutrition and Dietetics

Title of Thesis: The Relationship Of Food Craving With Body Mass Index, Eating Attitude And Nutrition Knowledge Level Among Students: A Foundation University Sample

Owner of the Thesis: Senem YUMUŞAK

Examination Date: 11.06.2024

This study have approved as a Master Thesis in regard to content and quality by the Jury.

	Title, Name-Surname (Institution)
Chair of the Jury:	Asst. Prof. Dr. Melike Şeyma Deniz (Fenerbahçe University Faculty of Health Sciences, Department of Nutrition and Dietetics)
Supervisor:	Assoc. Prof. Dr. İrem KAYA CEBİOĞLU (Yeditepe University Faculty of Health Sciences, Department of Nutrition and Dietetics)
Member/Examiner:	Asst. Prof. Dr. Gözde DURLU BİLGİN (Yeditepe University Faculty of Health Sciences, Department of Nutrition and Dietetics)

APPROVAL

This thesis has been deemed by the jury in the accordance with the relevant articles of Yeditepe University Graduate Education and Examinations Regulation and has been approved by Administrative Board of Institute with decision dated and numbered

Prof. Dr. Bayram YILMAZ
Director of Health Sciences Institute

DECLARATION

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree except where due acknowledgment has been made in the text.

09.07.2024

Senem YUMUSAK



DEDICATION

First and foremost, I would like to express my gratitude to my supervisor, Associate Prof. Dr. Irem KAYA CEBIOGLU, who generously shared her valuable time and profound knowledge throughout the entire process and consistently offered support whenever I needed it. She helped me overcome all challenges, and patiently answered all my questions. It has been a great honor and pleasure to be her master's student.

I am thankful and gracious for my precious mother Emine YUMUSAK, my beloved father Kenan YUMUSAK, my dearest brother Ferhat Kuzey YUMUSAK, and my lovely aunts Azime TUNA and Aysel TUNA, who have always stood by me, supported me every step of the way, and helped me become the person I am today.

I also would like to express my gratitude to my beloved fiancé Fuat Cem ZUMBULYUVA, who has been by my side throughout my whole academic journey, always motivating me, encouraging me, and supporting me.

Lastly, I would like to extend my heartfelt thanks to Bengisu ATES, Deniz OZYALCIN, and Merve Safa AVAG, who have been the most valuable gifts of my master's journey. I couldn't have done it without you.

TABLE OF CONTENTS

THESIS APPROVAL	II
DECLARATION.....	III
DEDICATION.....	IV
TABLE OF CONTENTS	V
LIST OF FIGURES.....	VIII
LIST OF TABLES.....	IX
LIST OF SYMBOLS AND ABBREVIATIONS.....	X
ABSTRACT	XI
ÖZET (TURKISH).....	XII
1. INTRODUCTION AND PURPOSE.....	1
2. LITERATURE REVIEW	3
2.1 BODY MASS INDEX	3
2.2 EATING BEHAVIOR	4
2.2.1 EMOTIONAL EATING BEHAVIOR.....	5
2.2.1.1 THEORIES CONCERNING EMOTIONAL EATING BEHAVIOR	5
2.2.1.2 ROLE OF EMOTIONAL EATING IN FOOD CHOICES	8
2.3 EATING ATTITUDE	8
2.4 EATING DISORDERS	9
2.4.1 EPIDEMIOLOGY OF EATING DISORDERS	10
2.4.2 ETIOLOGY OF EATING DISORDERS	10
2.4.2.1 BIOLOGICAL FACTORS	10
2.4.2.2 PSYCHOLOGICAL FACTORS	11
2.4.2.3 SOCIOCULTURAL FACTORS	12
2.4.3 CLASSIFICATION OF EATING DISORDERS	12
2.4.3.1 PICA.....	12
2.4.3.2 RUMINATION DISORDER.....	13
2.4.3.3 AVOIDANT/RESTRICTED FOOD INTAKE DISORDER.....	13
2.4.3.4 ANOREXIA NERVOSA	14
2.4.3.5 BULIMIA NERVOSA	15
2.4.3.6 BINGE EATING DISORDER	17

2.4.3.7 OTHER SPECIFIED EATING DISORDERS	18
2.4.3.8 UNSPECIFIED FEEDING OR EATING DISORDERS	18
2.5 NUTRITION KNOWLEDGE.....	18
2.5.1 NUTRIENTS.....	19
2.5.1.1 CARBOHYDRATES	19
2.5.1.2 PROTEIN	20
2.5.1.3 FATS.....	20
2.5.1.4 VITAMINS.....	21
2.5.1.5 MINERALS	21
2.5.1.6 PHYTOCHEMICALS.....	22
2.5.2 FACTORS AFFECTING NUTRITION KNOWLEDGE LEVEL	22
2.5.3 ROLE OF NUTRITION KNOWLEDGE IN FOOD CHOICES.....	22
2.6 FOOD CRAVINGS	23
2.6.1 UNDERSTANDING FOOD CHOICES THROUGH DESIRE.....	23
2.6.2 DEFINING AND MEASURING FOOD CRAVINGS	24
2.6.3 THE ROLE OF FOOD CRAVINGS IN DISRUPTED EATING BEHAVIORS.....	26
2.6.4 SEX DIFFERENCES IN FOOD CRAVINGS.....	26
2.6.5 CULTURAL VARIATIONS IN FOOD CRAVINGS.....	27
2.7 THE UNIVERSITY LIFE AND ITS DISTINCTIVE ATTRIBUTES.....	27
3. MATERIALS AND METHODS.....	29
3.1 PARTICIPANTS.....	29
3.2 DATA COLLECTION.....	29
3.2.1 DATA COLLECTION FORM	30
3.2.2 SCALES	30
3.3 STATISTICS	32
3.4 ETHICAL.....	32
4. RESULTS.....	33
5. DISCUSSION	45
6. CONCLUSION AND RECOMMENDATIONS	49
7. REFERENCES.....	51
8. APPENDIXES.....	62
8.1. APPENDIX 1 (INFORMED CONSENT FORM)	62

8.2. APPENDIX 2 (SCALES).....	63
8.3. APPENDIX 3 (PERMITS ABOUT THESIS).....	68
8.4. APPENDIX 4 (ETHICS COMMITTEE APPROVAL CERTIFICATE).....	69
8.5. APPENDIX 5 (CURRICULUM VITAE)	71



LIST OF FIGURES

Figure 2.1 Schematic diagram of factors influencing the desire to eat a particular food.....23
Figure 2.2 Conceptual overlap of commonly defined forms of food craving.....25



LIST OF TABLES

Table 2.1 Nutritional status according to Body Mass Index.....	3
Table 2.2 Desire, specific desire, and food cravings.....	24
Table 4.1 Distribution of descriptive characteristics of the sample.....	33
Table 4.2 Descriptive quantitative properties of the sample.....	35
Table 4.3 Distribution of reliability coefficients for the scales.....	36
Table 4.4 Comparison of scale scores based on sex.....	37
Table 4.5 Comparison of scale scores based on BMI classification.....	39
Table 4.6 Comparison of scale scores based on smoking status.....	41
Table 4.7 Comparison of scale scores based on eating attitude status.....	42
Table 4.8 Examining the relationships between quantitative findings and scales.....	43
Table 4.9 Examining the relationships between food cravings and other scales.....	44

LIST OF SYMBOLS AND ABBREVIATIONS

AN: Anorexia Nervosa

APA: American Psychiatric Association

BED: Binge Eating Disorder

BMI: Body Mass Index

BN: Bulimia Nervosa

CSA: Childhood Sexual Abuse

DSM-V: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

EAT-26: Eating Attitudes Test

ED: Eating Disorder

FCI: Food Craving Inventory

kg: kilogram

m: meter

RDA: Recommended Dietary Allowance

SPSS: Statistical Package for the Social Sciences

WHO: World Health Organization

YETBID: Nutrition Knowledge Level Scale for Adults

ABSTRACT

Yumuşak, S. (2024). The relationship of food craving with body mass index, eating attitude and nutrition knowledge level among students: A foundation university sample. Yeditepe University, Institute of Health Science, Department of Nutrition and Dietetics, MSc Thesis, Istanbul.

This study aims to examine the frequency and types of food cravings in the daily lives of university students, as well as to investigate the relationship of food cravings with body mass index, eating attitudes, and nutritional knowledge levels. During this critical period when young people transition to adult eating patterns, examining whether their food cravings predict obesity and eating disorders is crucial for providing proper education, guidance, and overall well-being. The study was designed as a cross-sectional descriptive study and conducted with 375 students (244 women, 131 men) from Yeditepe University Kayışdağı 26 August Campus. The mean body mass index of the group was 22.93 ± 3.99 kg/m². Turkish version of Food Craving Inventory (FCI-TR) was used to identify food cravings, Eating Attitude Test (EAT-26) was used to determine impaired eating attitudes, Nutrition Knowledge Level Scale for Adults (YETBID) was used to identify the nutritional knowledge, and Body Mass Index (BMI) (kg/m²) was used to determine obesity status. The data was collected in face-to-face interviews using a questionnaire. As a result of the study concluded that food craving levels differs according to gender, BMI, impaired eating attitudes, however not with nutrition knowledge level and smoking status. It found that the sub-dimensions of EAT-26 differed according to gender, BMI, and the sub-groups of FCI-TR. In conclusion, food cravings may be a predictor of obesity risk factors and unhealthy eating attitudes.

Keywords: Food craving, university students, Food Craving Inventory (FCI), Eating Attitude Test (EAT-26), nutrition knowledge

ÖZET (TURKISH)

Yumuşak, S. (2024). Öğrencilerde Yeme İsteğinin Beden Kütle İndeksi, Yeme Tutumu ve Beslenme Bilgi Düzeyi ile İlişkisi: Bir vakıf üniversitesi örnekleme. Yeditepe Üniversitesi, Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik ABD, Yüksek Lisans Tezi, İstanbul.

Bu çalışma, üniversite öğrencilerinin günlük yaşamlarındaki yeme isteklerinin sıklığını ve türlerini incelemeyi ve bu isteklerin beden kütle indeksi, yeme tutumları ve beslenme bilgi düzeyleri ile olan ilişkisini araştırmayı amaçlamaktadır. Gençlerin yetişkin yeme alışkanlıklarına geçiş yaptığı bu kritik dönemde, yeme isteklerinin obezite ve yeme bozukluklarını öngörüp öngörmediğini incelemek, doğru eğitim, rehberlik ve genel sağlık için önemlidir. Çalışma, kesitsel tanımlayıcı bir çalışma olarak tasarlanmış ve Yeditepe Üniversitesi Kayışdağı 26 Ağustos Kampüsü'nden 375 öğrenci (244 kadın, 131 erkek) ile gerçekleştirilmiştir. Grubun ortalama beden kütle indeksi (BKİ) 22.93 ± 3.99 kg/m² olarak belirlenmiştir. Yeme isteklerini belirlemek için Yeme İsteği Envanteri (FCI-TR), bozulmuş yeme tutumlarını belirlemek için Yeme Tutum Testi Kısa Formu (EAT-26), beslenme bilgisini belirlemek için Yetişkinler için Beslenme Bilgi Düzeyi Ölçeği (YETBID) ve obezite durumunu belirlemek için BKİ (kg/m²) kullanılmıştır. Veriler, yüz yüze görüşmelerle bir anket kullanılarak toplanmıştır. Çalışmanın sonucunda, yeme isteklerinin cinsiyet, BKİ ve bozulmuş yeme tutumlarına göre farklılık gösterdiği, ancak beslenme bilgi düzeyi ve sigara içme durumu ile farklılık göstermediği sonucuna varılmıştır. EAT-26'nın alt boyutlarının, cinsiyet, BKİ ve FCI-TR alt gruplarına göre farklılık gösterdiği bulunmuştur. Sonuç olarak, yeme istekleri, obezite risk faktörleri ve sağlıksız yeme tutumlarının bir göstergesi olabilir.

Anahtar Kelimeler: Yeme isteği, üniversite öğrencileri, Yeme İsteği Envanteri, Yeme Tutum Testi, beslenme bilgisi

1. INTRODUCTION AND PURPOSE

The primary aim of individuals, families, and society is to attain and uphold good health and productivity. The symbol of health and productivity is a well-developed body structure encompassing physical, mental, spiritual, and social dimensions characterized by sustained functionality over an extended period without interruption. Maintaining this functionality is dependent upon one of the most fundamental requirements, which is nutrition. Nutrition includes the intake of nutrients necessary to support growth, development, and maintenance of life, as well as to maintain and improve the state of health (1).

One major factor driving the substantial global rise in obesity and eating disorders is the impact of emotions on eating behaviors, which encompasses nutrition. Individuals are profoundly affected by their emotions in various aspects of their eating behaviors, including quantity, meal frequency, and food choices (2,3).

Eating behaviors, such as overeating that perpetuate obesity and eating disorders can result from food cravings. Food craving is defined as an intense desire to eat a particular food (4). This specificity distinguishes the concept of "food craving" from the general consumption of any type of food. Food cravings are significant determinants of eating behavior and weight gain, and they are positively correlated with body mass index (5).

An eating attitude is the whole set of thoughts, feelings, behaviors, beliefs, and relations with foods. Understanding eating attitudes helps to understand food choices (6). One of the basic building blocks of eating disorders is the negative process experienced in eating attitudes and behaviors. Food cravings are mostly associated with obesity and eating disorders, which are the basis of impaired eating attitudes (7–9). White and Grilo (2005) observed that individuals with binge eating disorder and obesity tend to experience higher craving levels for sweets compared to other types of food (7).

Eating attitudes and behaviors are shaped in the early stages of life. These characteristics, which begin to be shaped in youth, become stable during university life (10). The literature has shown that university students do not have ideal eating behaviors (11–13). University students tend to eat less regular and less healthy foods and have cravings for highly processed, delicious foods containing high levels of refined carbohydrates, sugars, and fats (14,15). High consumption of these nutrients is positively associated with the risk of obesity (16–18).

The lack of nutritional knowledge is a crucial factor influencing the eating behaviors and nutritional habits of university students (19,20). Nutritional knowledge is the knowledge

of nutrition and nutrients. Energy content of nutrients, fats, carbohydrates, proteins, vitamin and mineral sources, and sources of phytochemicals can be evaluated within the scope of nutrition information. Basic nutritional knowledge affects the food preferences and nutrient intake of individuals (21). Therefore, there is a notable relationship between the level of nutrition knowledge and obesity (22,23).

Regarding food cravings, cultural factors can be determinative as different cultures are known to have desires for their own country's foods (8). It is crucial to examine the frequency of food cravings in students to identify risky foods specific to their country that may continue simultaneously with impaired eating attitudes. Identifying the risk will be a pioneer for designing activities aimed at improving the eating attitudes of university students and increasing their levels of nutritional knowledge. This study was created to identify the relationship between food craving for Turkish foods and body mass index, eating attitudes and nutrition knowledge level among university students.

The purpose of the study is to examine the relationship between BMI and the frequency of food cravings for Turkish foods, examine the relationship between eating attitude and frequency of food cravings, and examine the relationship between nutritional knowledge level and the frequency of food cravings.

2. LITERATURE REVIEW

2.1 Body Mass Index

Body Mass Index (BMI) is a commonly used anthropometric measure that quantifies an individual's body weight in relation to their height, offering a numerical representation of body composition. The formula for BMI is stated as the individual's weight in kilograms divided by the square of their height in meters (kg/m^2). It is a practical and convenient tool for assessing weight categories and categorizing individuals into different weight status classifications, such as underweight, normal weight, overweight, and obesity. It does not provide a direct measure of body fatness or offer insights into an individual's overall health. Indeed, it's crucial to emphasize that these categories carry different levels of health risk (24–26).

For adults over 20 years old, BMI falls into one of the following categories according to WHO (Table 2.1) (27). It is calculated using the same formula for both children and adolescents, yet it can be interpreted based on distinct criteria (26).

Table 2.1 Nutritional status according to BMI

BMI	Nutritional status
Below 18.5	Underweight
18.5-24.9	Normal weight
25.0-29.9	Pre-obesity
30.0-34.9	Obesity class I
35.0-39.9	Obesity class II
Above 40	Obesity class III

Source: World Health Organization. A healthy lifestyle - WHO recommendations. 2010.

Numerous studies emphasize the importance of BMI as a crucial health indicator. Individuals with a BMI below 18.5 or equal to or greater than 30.0 are at higher risk of chronic diseases and premature mortality (28,29). Individuals with a BMI equal to or exceeding 30.0 are at an elevated risk of developing cardiovascular diseases, type 2 diabetes, kidney diseases, mobility issues, and non-alcoholic fatty liver disease (30–34). In a study comprising 16,868 individuals, those classified as "obese" based on BMI demonstrated a 20% increased risk of mortality from all causes and heart disease compared to individuals within the normal BMI category. Additionally, individuals categorized as "underweight" or "obesity class III"

experienced an average reduction in lifespan by 6.7 years and 3.7 years, respectively, compared to individuals within the normal BMI category (35).

In Turkey, the risk increases due to increasing BMI values, which causes increased health risks. According to TUIK data, in 2019, the obesity rate in Turkey for individuals aged 15 years and over was 21.1%, and it decreased to 20.2% by 2022. In the same year, it was observed that 23.6% of women fell into the obese category, while 30.9% were classified as pre-obese. For men in 2022, the obesity rate was 16.8%, and the pre-obesity rate was 40.4% (36).

BMI is negatively associated with food choices rich in fruits, vegetables, legumes, and grains. Adversely, obesity is linked to high-energy and tasty food choices (37). The sweet preference is similar in both obese and non-obese individuals. However, a higher BMI is associated with lower perceived sweetness. Overweight individuals may prefer more fatty foods compared to those with normal weight, which could be one of the reasons for maintaining their current weight status (38).

According to Dressler and Smith (2013), the taste factor influences food choices independently of BMI, while food prices serve as a significant determinant of dietary preferences for overweight and obese women. The health factor has predominantly influenced food choices among normal-weight participants. Women who are overweight and have obesity tend to embrace a wide variety of food choices, including both healthy and less healthy options. Additionally, they report using food more frequently as a coping mechanism during periods of stress, depression, or boredom. In contrast, individuals with normal weight consume less or the same amount of food when experiencing negative emotions (39).

Emotions and, accordingly, eating behaviors are one of the main regulators of change in BMI. Elevated emotional (the inclination to overeat in response to moods) or external (a propensity to eat in response to food cues such as the sight and smell of food) overeating behaviors are commonly linked to a higher BMI (40–44). However, what is more interesting is that individuals with overweight or obesity appear to be more driven by emotional eating, as opposed to external eating, leading to overeating and subsequent weight gain. In short, higher emotional eating behavior is associated with weight gain (45).

2.2 Eating Behavior

In the physiology of eating regulation, the nervous system, gastrointestinal system, pancreas, and adipose tissue work together through neuroendocrine feedback loops. These advanced biological systems ensure the maintenance of homeostasis. Consequently, the

establishment of energy balance within the body, as well as the prevention of hunger and overeating, becomes achievable (46).

Eating regulation can be intensely affected by various environmental factors independent of physiological energy needs and subsequently lead to disturbances in eating behavior. For children, eating in larger groups can result in an increase in the nutritional intake of undernourished ones while simultaneously raising the risk of overweight and obesity in those who tend to overeat (47). At the outset of a meal, neurons respond robustly to food, but this response diminishes as satiety is reached. Nevertheless, it does not prevent viewing other foods as potential "rewards" (46). Even if there is only one favored food during a meal, the presence of different foods in the environment can enhance consumption. Essentially, the likelihood of consuming tastes that are distinct in nature sequentially (bitter, salty, sour, sweet) is high. Therefore, the coexistence of different tastes contributes to the rising prevalence of obesity, especially in Western societies (48).

2.2.1 Emotional Eating Behavior

The increasing prevalence of obesity and eating disorders in Western societies has led to a wealth of research on the role emotions play in the etiology of these issues. It is indicated that our emotions can lead to an increase or decrease in appetite and food intake by approximately 30-48%. While emotions have a significant impact on eating behaviors, determining precisely how our emotions affect nutrition remains challenging (49).

2.2.1.1 Theories Concerning Emotional Eating Behavior

The association of emotions with different situations and outcomes has given rise to the development of certain theories. The psychosomatic theory, internal-external obesity theory, restraint theory, and escape theory represent four distinct theoretical frameworks explaining the phenomenon of emotional eating behavior.

Psychosomatic Theory

The discourse surrounding emotional eating behavior is predominantly framed within the context of the "psychosomatic theory." Kaplan and Kaplan (1957) suggested that individuals with obesity tend to eat when anxious, as eating can temporarily reduce anxiety. This anxiety reduction mechanism involves factors like protein and carbohydrate intake affecting brain neurotransmitter synthesis, especially serotonin. Learning plays a role in pleasurable situations. Also, there's a physiological aspect to this: eating temporarily diminishes intense fear or anxiety. Individuals with obesity may find it challenging to differentiate between feelings of anxiety and

hunger, as they have learned to eating in response to both. This can result in compulsive overeating and obesity, especially when using food as a coping mechanism for anxiety (50).

According to Bruch (1973), the emotional eating behavior approach has two major hypotheses. First, negative emotions rise the drive to eat, thereby induce eating action. Secondly, eating behavior reduces the intensity of negative emotions. The hunger sensation is not innate and requires learning to develop recognizable patterns. In the case of individuals with obesity, they struggle to recognize when they are hungry or full and cannot differentiate between the need for food and other uncomfortable sensations and emotions. They rely on external cues to determine when and how much to eat, as their internal awareness is not properly developed. Consequently, according to this theory, individuals with obesity tend to overeat in response to emotional tension and discomfort, as they use food to cope with these feelings (51).

Macht and Simons (2000) provided experimental support for the theory that negative emotions can trigger binge eating behavior. Their study involving 23 women examined the emotional states encountered in daily life and investigated the subjective eating motivation associated with these events. The results indicated that eating motivation heightened during periods of negative emotions, highlighting the use of food as an emotional coping mechanism in the non-clinical population (52). These findings support the first hypothesis that negative emotions increase the motivation to eat and induce eating.

Internal-External Obesity Theory

Schachter (1968) developed the internal-external obesity theory with the purpose of providing a more detailed explanation and conducting further testing of the psychosomatic theory. In this context, the physiological responses to fear and anxiety are posited to prompt a reduction in consumption among individuals of normal weight, whereas individuals with obesity, being less responsive to internal cues, may not experience a similar effect. Aligning with Bruch (1973), it is suggested that recognizing physiological cues, such as gastric motility, as 'hunger' is a phenomenon that can be learned. Normal weight individuals typically correctly interpret gastric movement as hunger, while overweight individuals may not. Due to a diminished sensitivity to internal cues, individuals with obesity rely more on external cues to initiate and cease eating (53).

In contrast to psychosomatic theories that predict increased eating in individuals with obesity under stress to alleviate anxiety, Schachter's theory proposes that normal weight individuals may either decrease or increase their eating when stressed, but individuals with obesity will not exhibit a decrease. An initial study by Schachter et al. (1968) supported this prediction (53,54).

Restraint Theory

Restraint theory was first developed by Herman and Mack (1975) and further explained by Herman and Polivy (1980) (55,56). They propose that the equilibrium between the desire for food and the effort to resist it shapes eating behaviors, with restraint involving the cognitive effort to counteract this desire. Individuals with restrained eating habits are persistently concerned about their food choices and limit their intake to avoid weight gain. In contrast, unrestrained eaters consume food without worry or restrictions. Additionally, these authors introduced the 'disinhibition hypothesis,' which suggests that the self-control of restrained eaters can be temporarily undermined by specific triggers or 'disinhibitors' such as alcohol consumption, intense emotional states, or episodes of overeating.

Negative emotions have been observed to enhance food intake, particularly high-fat foods and sweets, in both restrained eaters and emotional eaters. It has been suggested that emotional eaters consume food to lighten negative emotions, while restrained eaters may increase their food intake when their cognitive control over restrictive eating patterns is compromised (57). Despite indications that restrained and emotional eating involves distinct neurobiological processes (58), it is still unclear if the mechanisms behind increased consumption in response to emotions differ between these two groups.

The current model proposes two empirical tests to investigate distinct mechanisms. Firstly, differences in eating responses to various emotions and stressors should be observed between emotional and restrained eaters. Restrained eaters may consume more food in response to both negative and positive emotions, as well as cognitive stress, whereas emotional eaters are likely to increase their intake only when experiencing negative emotions. Secondly, emotion-induced eating is anticipated to have divergent effects on emotional states. Emotional eaters; aiming to lighten negative emotions through eating, should report a reduction after eating. In contrast, restrained eaters, concerned about weight gain; are expected to experience either no change or a deterioration in mood due to emotion-induced eating (57).

Escape Theory

The Escape Theory (Heatherton and Baumeister 1991) suggests that the behavior of consuming excessive amounts of food in reaction to negative emotions serves as a form of escape or diversion from an ego-threatening stimulus, which triggers an undesirable self-awareness. Individuals who engage in emotional eating are striving to distance themselves from self-awareness when confronted with threatening information about their own selves. The goal is to avoid the implications and negative emotional impact associated with this self-awareness. In an attempt to break free from this self-awareness, people resort to directing their attention

towards an external stimulus, often manifesting as the consumption of food, leading to episodes of overeating (59).

2.2.1.2 Role of Emotional Eating in Food Choices

Emotions exhibit distinctions in terms of their precursor conditions, physiological associations, occurrence frequency, and duration (60). Connections between an emotion and eating behavior are expected to be more robust when this emotion is encountered more often in eating situations than other emotions and when it results in physiological and behavioral changes more closely linked to eating (52). Varying amounts of food are consumed in reaction to positive and negative emotional states. There is an increased tendency to opt for nutritious food when experiencing positive emotions and an increased tendency to choose less healthy or "junk" food when confronted with negative emotions (61). On the other hand, meals consumed in both positive and negative emotional states were notably more substantial in size compared to meals consumed in a neutral emotional state. Additionally, it was observed that a positive mood exerts a more pronounced influence on food intake than a negative mood (62).

2.3 Eating Attitude

Eating attitudes encompass a spectrum of beliefs, thoughts, feelings, and behaviors, shaping an individual's intricate relationship with food. This multifaceted interplay influences overall well-being and psychological health (63). It aids in comprehending food choices, shedding light on the complex interplay of factors that influence individual preferences, habits, and the broader context shaping dietary decisions (6).

Understanding eating behaviors is integral to comprehending eating attitudes. The development of an individual's subjective eating attitude results from repeated eating behavior over time. Various factors, including the living environment, cultural influences, habits, and social interactions, significantly contribute to the formation and evolution of eating attitudes. It is imperative to delve into these factors to gain insight into the complexities of individuals' relationships with food. The interplay between external elements and internalized attitudes forms a dynamic framework that influences how individuals perceive and engage with their eating habits (64).

Early life plays a crucial role in shaping eating attitudes and behaviors, as evidenced by observations that young individuals may display unhealthy patterns that may not align with diagnostic criteria. Recognizing these early signs is essential for implementing timely interventions and fostering healthier relationships with food among the younger population (10).

Impaired eating attitudes can result from strict eating behaviors, excess body weight, and body image concerns. Notably, a decrease in BMI due to rigid eating behaviors may further exacerbate the impact on eating attitudes. Understanding these interconnected factors is crucial for developing comprehensive approaches to address and improve individuals' relationships with food and their bodies (65). There is a strong link between obesity and body image dissatisfaction intertwined with impaired eating attitudes. This complex relationship is indicative of the psychological dimensions of the complex problem of obesity (66).

The term "impaired eating attitude" is frequently employed to delineate the trajectory leading to the development of an eating disorder. The emergence of eating disorders is a serious concern, stemming from compromised eating attitudes that serve as the underlying framework for the disorder's progression. Various factors contribute to the formation of an individual's eating behavior from birth, encompassing the reward mechanism, homeostatic systems, sensory and motor system development, as well as the influence of the environment, culture, and parental attitudes. Although eating is an inherent aspect of life, it can transform into a psychiatric condition marked by obsessions or deviations from typical eating behaviors. This intricate interplay of psychological, physiological, and environmental elements underscores the multifaceted nature of eating disorders (67,68).

2.4 Eating Disorders

Eating disorders (EDs) are distinguished by persistent patterns of problematic eating and involvement in activities aimed at decreasing body weight or preventing weight gain (69). The development of EDs, although a specific cause and pathogenesis is unknown (70), is suggested to be influenced by many biological, psychological, and sociocultural factors. If left untreated, it has the potential to give rise to morbidity and mortality fatality (71,72).

Within the complex structure of impaired eating attitudes and distorted body image, individuals find themselves grappling with perceptions of their bodies as either overweight or inadequately shaped. This distorted self-perception becomes a catalyst for a profound and often alarming response: a strict restriction of food intake. This restrictive behavior extends beyond mere dietary choices into destructive practices like self-induced vomiting after meals, reliance on laxatives, and an unrelenting commitment to excessive exercise (73).

University students are a demographic group that is particularly prone to developing EDs due to their stage of life. This vulnerability is not only attributed to their age but is also intertwined with the issue of psychosocial and economic challenges often accompanying the pursuit of higher education. The transitional phase of college life, characterized by newfound

independence, academic pressures, and navigating complex social dynamics, emerges as fertile ground for the onset and development of EDs (73,74).

2.4.1 Epidemiology of Eating Disorders

While it is crucial to recognize that EDs can affect individuals of all sexes, prevailing evidence underscores a notable discrepancy in the prevalence and susceptibility, with women often facing a heightened risk compared to men. This gendered disparity is rooted in a complex interplay of psychological, biological, and socio-cultural factors that contribute to the development and perpetuation of disordered eating behaviors (75).

On the contrary, this perspective is currently facing criticism for several reasons. Criticisms include shortcomings in diagnostic criteria, disparities in the manifestation of symptoms between sexes, and the observed prevalence of studies primarily conducted on women (76). The inclusion of amenorrhea as a diagnostic criterion in Diagnostic and Statistical Manual of Mental Disorders-IV-TR (DSM-IV-TR) has been determined as a factor impeding the diagnosis of men. With the introduction of Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5), this criterion has been removed, eliminating the sex-based distinction (77).

Looking at data specific to Turkey, in a large-scale prevalence study conducted in the city center of Sivas, the point prevalence of ED was 1.52%. In addition, Binge Eating Disorder has been found to be the most common ED (78). In another population-based study measuring the prevalence of ED, the prevalence of all EDs was 2.3%, the prevalence of Anorexia Nervosa was 0.03%, and the prevalence of Bulimia Nervosa was 0.7% (79). In a study conducted on a sample of university students in Istanbul, the point prevalence of ED was found to be 1.55%, 0.16% for Anorexia Nervosa, 0.11% for Bulimia Nervosa, and 0.21% for Binge Eating Disorder. For subthreshold values, it was found to be 0.05% for Anorexia Nervosa, 0.32% for Bulimia Nervosa, 0.48% for Binge Eating Disorder, and 0.21% for Unspecified Feeding or Eating Disorders (80).

2.4.2 Etiology of Eating Disorders

The development of EDs, although a specific cause and pathogenesis is unknown (70), is suggested to be influenced by many biological, psychological, and sociocultural factors.

2.4.2.1 Biological Factors

An expanding body of twin studies has substantiated an undeniable association between genetic factors and EDs (81). EDs exhibit a moderate to high degree of heritability. Twin studies

suggest heritability estimates of 28 to 74% for anorexia nervosa, 54 to 83% for bulimia nervosa, and 41 to 57% for binge-eating disorder. The wide confidence intervals associated with most individual studies contributing to these estimates are due to low statistical power resulting from relatively small sample sizes attributable to the low prevalence of EDs (82).

According to the neurobiology side, Serotonin (5HT) regulates appetite and mood, with dysregulation linked to anxiety, aggression, and EDs. The cause of 5-HT dysfunction in EDs remains unclear, but studies suggest the involvement of receptor activities, transporter levels, and CSF 5-HIAA. Persistent alterations in serotonin activity, anxiety, perfectionism, and obsessive behavior endure post-recovery from anorexia and bulimia. Serotonin may indirectly influence ED development through associated personality traits. Experimental findings indicate that aberrant eating behaviors may alter serotonin function, persisting even after recovery (81).

Since EDs typically manifest during adolescence, it is crucial not to overlook the impact of developmental conditions on the onset of the disease. Adolescence represents a phase marked by significant biological and social transformations, where heightened emphasis on body development, appearance, and evolving social environments may pose risks with regard to eating behavior and the development of EDs (80).

2.4.2.2 Psychological Factors

Various factors contribute to the initiation of EDs, including individual personality traits. Participation in activities endorsing thinness, like ballet dancing or athletics, may act significant roles. A fear of losing control, rigid thought patterns, and perfectionism heighten susceptibility. Self-esteem intricately linked to body shape intensifies vulnerability, fostering dissatisfaction. The profound desire to achieve thinness becomes a driving force, intertwining with societal pressures (83).

Body image is another one of the leading psychological factors. In a prospective study on college freshman women, a correlation emerged between symptoms of EDs and factors such as dissatisfaction with one's figure, heightened public self-consciousness, and feelings of ineffectiveness. These findings underscore the complex interaction of social and psychological factors contributing to the vulnerability of this demographic (84).

Childhood sexual abuse (CSA) as a risk factor for EDs sparks debate. Some studies indicate a strong link, while others reject it. Inconsistencies stem from varying CSA definitions. Quebec's rising CSA reports from 1998 to 2003 signal potential psychiatric issues, including EDs, in Canada (81,85).

Family relationships and attachment patterns may also play an important role. Uncontrollable eating behaviors often serve as a coping mechanism for the perceived loss of a secure, loving bond with parents. Furthermore, oral aggression may manifest as a defense against the fear of deprivation or extinction. These dynamics emphasize the interconnectedness of familial dynamics and psychological struggles (86).

2.4.2.3 Sociocultural Factors

The global surge in EDs is attributed to Western culture's emphasis on a slim women body ideal. Countries like Japan, Iran, and Singapore witness rising rates, particularly among women exposed to Western culture through education, brief vacations, or media exposure (81). The influence of social media and unrealistic advertisements significantly contributes to shaping distorted beliefs regarding the women body's ideal shape. Exposure to curated images on these platforms fosters unrealistic beauty standards, influencing individuals to internalize and adopt skewed perceptions, ultimately impacting the development of their beliefs about body image and shape (87,88). Among adolescents, peer influence stands out as a prominent factor, exerting a substantial impact on their behaviors. The pronounced influence peers wield over each other during this developmental stage significantly shapes eating behaviors (89).

2.4.3 Classification of Eating Disorders

ED is included in DSM-5 published by the American Psychiatric Association, under the title of 'Feeding and Eating Disorders', as Pica, Rumination Disorder (RD), Avoidant/Restricted Food Intake Disorder (ARFID), Anorexia Nervosa (AN), Bulimia Nervosa (BN), Binge Eating Disorder (BED), Other Specified Eating Disorders (OSFED), and Unspecified Feeding or Eating Disorders (UFED) (69).

2.4.3.1 Pica

Pica is defined by the habitual and excessive ingestion of substances that lack nutritional value or are non-food items (90). Existing literature indicates that conclusive determinations regarding the causative factors of pica have not been firmly established. Cultural pica, found in some countries as part of their traditions, is deemed normal within the context of their cultures (91). Exploring objects through oral and gustatory means is considered a normal and healthy part of child development, and such behavior is not classified as pathological pica. Typically, young children may ingest materials such as paint, plaster, thread, hair, and fabric pieces, while older children may consume substances like soil, animal feces, stones, erasers, and paper (92).

This condition can also manifest during pregnancy and is often associated with low iron and hemoglobin levels (93).

Pica is defined in the DSM-5 as the persistent consumption of non-nutritive and non-food substances for a duration of one month or longer, which is developmentally inappropriate and culturally and socially abnormal. If the condition occurs due to another mental illness, it is severe enough to warrant further clinical evaluation (94).

2.4.3.2 Rumination Disorder

RD is characterized by repetitive regurgitation of food, often described as involuntary or habitual. Rumination is a normal physiological process performed by ruminant animals to enhance the digestibility of ingested food. However, when it occurs repetitively in humans, it is considered pathological. Historically believed to manifest predominantly in children, infants, and individuals with developmental disorders, this condition is now recognized to also occur in healthy adolescents and adults (90). Incidence and prevalence studies are limited, and the disorder is considered rare. Estimated prevalence in the general population is approximately 2% (95).

The DSM-5 diagnostic criteria include regular regurgitation of food for at least one month, with the regurgitated food being either re-chewed, re-swallowed, or spit out. Individuals diagnosed within this category should not have any gastrointestinal diseases, and the symptoms should not emerge during other ED episodes (94).

2.4.3.3 Avoidant/Restricted Food Intake Disorder

ARFID is an ED characterized by the restriction of food intake without the typical concerns related to caloric content or body appearance observed in other EDs. Patients may present with psychiatric or medical conditions related to their food intake history, and individuals may limit food consumption to avoid risks such as post-meal pain, nausea, choking, vomiting, or negative feelings associated with eating (96). Insufficient data exists regarding its etiology. In a community-based study conducted in Sweden, children aged 8-13 were examined, revealing a prevalence of 3.2% (97) (Kurz). The prevalence rate in clinical samples is higher, with a prevalence range between 14-23% (96).

According to DSM-5, the diagnostic criteria for ARFID are as follows (94):

A. It is an ED characterized by the simultaneous presence of one or more symptoms, and the diagnostic criteria that distinguish it from other EDs include the following.

1. Significant weight loss (or the inability to achieve expected weight gain in children or interruption of growth),

2. Clearly noticeable nutritional deficiency,
3. Dependence on enteral (tube-assisted) or nutritional supplements for nourishment,
4. Evident decline in mental and social functionality.

At least one of these symptoms should be present, and the inability to consistently meet energy needs should be confirmed, unrelated to another physical or psychiatric condition.

B. It should not entail a deprivation of food or align with cultural dietary traditions.

C. There must be no indications of abnormal body weight or physical distress, and this ED should not predominantly manifest in conjunction with AN or BN.

D. The ED should not be attributable to a concurrent medical condition or more effectively explained by another mental disorder.

2.4.3.4 Anorexia Nervosa

AN is formerly defined as a lack of appetite and known as "nervous anorexia" in the past and first been documented in the 1870s. Over time, it has been understood that it is an intentional effort to achieve weight loss independent of the absence of appetite. Individuals harbor persistent concerns regarding food, body, and weight that occupy their minds. Individuals with AN exert significant efforts to control both weight and appetite. To achieve this objective, they engage in behaviors such as refusal to eat, reduced food intake, or compensatory actions (excessive exercise, use of diuretics or laxatives, self-induced vomiting etc.) to regulate calorie intake (98).

According to the DSM-5, for an individual to receive a diagnosis of AN, their BMI should be 17 kg/m² or below, and this weight loss should not be attributable to another organic disorder (94). The fear of weight gain in individuals with AN is often accompanied by a profound loss of insight regarding their actual body appearance. This lack of awareness can lead patients to underestimate the seriousness of their condition, driving them to persistently pursue weight loss irrespective of how dangerously low their body weight becomes (99).

AN is associated with numerous medical complications. These complications become more pronounced as the patient's weight deviates from the normal range. Most body systems and organs can be adversely affected. Metabolic dysregulations are prevalent in individuals with EDs, including conditions like hypercortisolemia and hypoglycemia. These disruptions stem from the nutritional imbalances inherent in disordered eating patterns, contributing to a cascade of physiological consequences. Gastrointestinal complications, notably constipation, emerge as a substantial concern, further underscoring the systemic impact of altered dietary

habits. Cardiovascular complications manifest in the form of bradycardia and hypotension, highlighting the strain on the cardiovascular system associated with insufficient nutrient intake. In women individuals, infertility and amenorrhea are recurrent phenomena indicative of the endocrine disruptions stemming from the interplay between nutritional deficiencies and hormonal imbalances (100,101).

The DSM-5 classification system categorizes AN into two distinct forms. The first type is the "Restrictive Form," characterized by behaviors such as restricted eating, complete avoidance of eating, or participation in extreme sports for three months without engaging in binge eating episodes. Weight loss is observed in this type due to minimal food intake and excessive exercise.

The second type within the DSM-5 for AN is the "Binge Eating and Purging Form." Diverging from the Restrictive Form, this subtype is characterized by three months of recurrent binge eating episodes followed by purging behaviors. This distinction reflects the varied expressions of AN, aiding in precise diagnosis and tailored interventions.

According to DSM-5, the diagnostic criteria for AN are as follows (94):

- A. The inclination to limit energy intake in line with perceived necessities results in a notably low body weight relative to an individual's age, gender, developmental path, and physical health.
- B. A profound fear of gaining weight, becoming overweight, or persistently engaging in behaviors that hinder weight gain despite having a significantly low body weight.
- C. Body image distortion is characterized by an excessive emphasis on body weight and shape.

BMI values are used in the DSM-5 to assess the severity of the condition:

- Not heavy: $BMI \geq 17 \text{ kg/ m}^2$
- Moderate: $BMI 16- 16.99 \text{ kg/ m}^2$
- Heavy: $BMI 15- 15.99 \text{ kg/ m}^2$
- Extremely: $BMI <15 \text{ kg/ m}^2$

2.4.3.5 Bulimia Nervosa

BN is marked by recurrent episodes of consuming objectively large quantities of food, often accompanied by a feeling of loss of control during these episodes. Individuals with BN also be into inappropriate compensatory behaviors and exhibit an excessive preoccupation with shape and weight.

One distinguishing feature that sets BN apart from AN is the pattern in which episodes of excessive eating, followed by compensatory behaviors, occur subsequent to periods of

dietary restriction. Unlike individuals with AN, those with BN tend to maintain a more balanced progression of body weight and do not typically reach low body weights (102).

In BN, the frequency of compensatory behaviors such as diuretic or laxative use, and vomiting can give rise to various medical complications affecting multiple organ systems. Renal complications include hypokalemia, hypochloremic metabolic acidosis, and hyperamylasemia, reflecting the systemic impact of disordered eating behaviors. The prevalent use of compensatory methods, particularly vomiting, contributes to a range of dental and gastrointestinal issues. Dental problems, such as enamel erosion and caries, are common due to the corrosive effects of stomach acid during vomiting. Gastrointestinal complications are notable, with conditions like esophagitis, dyspepsia, and gastroesophageal reflux disease frequently observed, underscoring the substantial impact of bulimia on the digestive system (101,103).

According to DSM-5, the diagnostic criteria for BN are as follows (94):

- A. Recurrent episodes of binge eating. A binge eating episode is marked by both of the following:
1. Eating within a distinct timeframe a notably larger amount of food than what most individuals would consume in a similar period under comparable circumstances.
 2. Feeling that you have no control overeating during this period.
- B. Engaging in recurrent, inappropriate compensatory behaviors to avoid weight gain, such as misuse of analgesics, self-inflicted vomiting, diuretics, or other medications, excessive exercise, or hardly eating at all.
- C. Both these binge eating behaviors and inappropriate compensatory behaviors have occurred, on average, at least once a week for three months.
- D. Self-assessment is excessively affected by body shape and weight.
- E. This disorder does not occur only during episodes of AN.

The frequency of inappropriate compensatory behaviors (usage of laxatives, diuretic medications, induced vomiting, excessive exercise, complete avoidance of eating) are used in the DSM-5 to assess the severity of the condition:

- Mild: 1-3 times a week on average.
- Moderate: 4-7 times a week on average.
- Severe: 8-13 times a week on average.
- Extreme: On average, 14 or more times a week.

2.4.3.6 Binge Eating Disorder

BED is an ED characterized by an individual consuming significantly larger amounts of food in a short period under the same circumstances than what most individuals would consume, experiencing a lack of control over their eating behavior, and recurrent episodes of excessive eating. What sets it apart from BN is the absence of compensatory measures such as the use of laxatives or diuretics, self-induced vomiting, prolonged restraint of eating habits, or exhaustive physical activities to counteract the effects of binge-eating episodes (104).

During binge-eating episodes, at least three of the following feelings are experienced: consuming an unusually large amount of food rapidly, a lack of physical hunger despite eating uncomfortably quickly, eating alone due to embarrassment about the quantity consumed, and experiencing feelings of disgust, guilt, or remorse following these episodes (105). In episodes characteristic of BED, individuals intentionally consume once-restricted foods in a premeditated manner, and the anticipation and fantasy surrounding these moments may extend over days. This compulsive overeating, marked by loss of control, underscores the complex nature of BED and its impact on both mental and physical well-being (98).

In BED, recurrent binge-eating episodes can lead to an increase in BMI beyond 30 kg/m², resulting in the onset of obesity. Cardiovascular diseases and diabetes, as well as potential consequences of obesity, may follow. Individuals with BED appear to be at a higher risk for gastric ulcers, hypercholesterolemia, lung problems, arthritis, and liver diseases (106).

According to DSM-5, the diagnostic criteria for BED are as follows (94):

- A. Recurrent binge-eating episodes are characterized by both of the following:
 1. Eating within a distinct timeframe a notably larger amount of food than what most individuals would consume in a similar period under comparable circumstances.
 2. A sense of lack of control overeating during the episode.
- B. Recurrent binge-eating episodes are associated with three (or more) of the following:
 1. Consuming food much faster than usual.
 2. Continuing to eat until feeling uncomfortably full.
 3. Eating substantial amounts of food even when not experiencing physical hunger.
 4. Choosing to eat alone due to embarrassment over the quantity of food consumed.
 5. Experiencing feelings of self-disgust, depression, or intense guilt following episodes of overeating.
- C. Marked distress regarding binge eating is present.
- D. The binge-eating episodes occur, on average, at least once a week for three months.

E. Binge-eating is not associated with inappropriate compensatory behaviors, as seen in BN, and does not occur exclusively during BN or AN.

The frequency of binge eating episodes is used in the DSM-5 to assess the severity of the condition:

- Mild: 1-3 times per week on average.
- Moderate: 4-7 times per week on average.
- Heavy: 8-13 times per week on average.
- Extreme: 14 or more binge eating episodes per week.

2.4.3.7 Other Specified Eating Disorders

This category has been established for the classification of individuals who exhibit symptoms of an ED that significantly impairs daily functioning yet does not precisely meet the diagnostic criteria for AN, BN, or BED.

- Atypical AN,
- low-frequency and/or limited-duration BN,
- low-frequency and/or limited-duration BED (characterized by symptoms occurring less than once a week and/or lasting less than three months),
- Purging Disorder (involving compensatory behaviors without binge eating),
- and Night Eating Syndrome are classified within this category (69).

2.4.3.8 Unspecified Feeding or Eating Disorders

This category is applied when there is notable distress and impairment in an individual's functioning, but none of the specific diagnostic criteria within the EDs diagnostic set are completely satisfied. This term is employed by clinicians when they opt not to specify the cause for not meeting diagnostic criteria or when insufficient information is available to make a more precise diagnosis. It serves as a pragmatic label when a comprehensive assessment is hindered by limited data or ambiguity in clinical presentations (69).

2.5 Nutrition Knowledge

In contemporary society, knowledge emerges as a potent force when considering individuals' nutritional status, impaired eating attitudes, and approaches to body image, all of which contribute to ensuing disorders. Nutrition knowledge pertains to the understanding of nutrition and dietary components. Within the realm of nutritional knowledge, one can evaluate the energy content of nutrients, carbohydrates, proteins, fats, sources of vitamins and minerals, and sources of phytochemicals (21).

2.5.1 Nutrients

2.5.1.1 Carbohydrates

Carbohydrates serve as the primary energy source for the body, with one gram yielding approximately 4 kilocalories. It is recommended that 45-65% of the body's daily energy requirements be derived from carbohydrates. This macronutrient plays a crucial role in fueling physiological functions, emphasizing the importance of maintaining a balanced carbohydrate intake within the overall dietary framework for optimal energy provision and overall well-being (1,107).

Carbohydrates are mostly found in plant-based foods. Plants produce nutrients using their chlorophyll, a process referred to as photosynthesis. Grains, legumes, potatoes, nuts, fruits, vegetables, and dairy products are fundamental sources (1). Indeed, in the realm of nutritional sciences, it is acknowledged that not all carbohydrates are equal. They can be classified into two categories—simple and complex. In particular, complex carbohydrates obtained from whole and unprocessed plant-based foods are generally deemed healthier compared to simple carbohydrates. This holds true, especially for those sourced from highly processed and sugar-added foods and beverages, which typically contribute to 'empty calories' (calories without nutrients). The increasing intake of these sources of empty calories is seen as a significant factor contributing to the global prevalence of obesity and overweight, particularly among children and young adults (108).

Dietary fiber is one of the most important types of complex carbohydrates. Dietary fiber is classified into two groups: soluble in water and insoluble in water, and it is found in varying proportions in different foods. From a perspective of healthy nutrition, it is essential to consume foods that contain both groups of fiber (109). Dietary fiber plays a pivotal role in promoting overall metabolic health by influencing fundamental pathways, notably insulin sensitivity (110,111). Its association with reduced cardiovascular disease risk and its role in supporting colon health and motility are well-documented (112–114). Moreover, dietary fiber actively contributes to the regulation of gut microbiota, appetite control, and modulation of chronic inflammatory pathways, highlighting its multifaceted impact on the intricate balance of physiological processes (115).

In adults, the recommended daily amounts of dietary fiber for promoting adequate bowel movements and preventing non-communicable diseases such as type 2 diabetes, cardiovascular disease, colorectal cancer, and overweight/obesity range from 25 to 38 grams (116).

2.5.1.2 Protein

Proteins constitute the fundamental building blocks of cells, the smallest units of the human body. They participate in the basic structure of enzymes and hormones, facilitating the functioning of chemical processes in the body. Proteins serve as an energy source in the body when there is an insufficient intake of carbohydrates and fats, with one gram yielding approximately 4 kilocalories (1). The international Recommended Dietary Allowance (RDA) for protein is 0.8 grams per kilogram of body weight (117), and it is recommended that 10-20% of the body's daily energy requirements be derived from proteins (118).

Amino acids, which constitute the fundamental building blocks of proteins, come in 20 different varieties. They are categorized into essential and non-essential amino acids. The body needs to obtain essential amino acids from external sources since it cannot produce them internally (1). Milk, yogurt, cheese, red meat and its products, poultry, fish, eggs, and legumes are among the most important protein sources. Dietary diversity is crucial because not all proteins from foods provide essential amino acids in the same proportion. Ensuring a varied diet becomes essential to meet the body's diverse amino acid requirements (118).

2.5.1.3 Fats

Fats are organic compounds composed of fatty acids and glycerol, with one gram yielding approximately 9 kilocalories. It is recommended that 25-30% of the body's daily energy requirements be derived from fats (1). Fats are broken down into fatty acids, forming the building blocks in the digestive system, and are absorbed. While some are used for energy, others are stored, and some contribute to the formation of structures such as cell membranes, hormones, and cholesterol. An increase in body fat occurs when the energy intake from food exceeds the expended energy, and conversely, it decreases when the opposite happens. Fats, being the primary energy reservoir, are utilized when sufficient energy from carbohydrates is not obtained (118).

The building blocks of fats are fatty acids. They are basically categorized into saturated and unsaturated fatty acids according to their hydrocarbon chains, which are bound by single or double bonds. Saturated fatty acids are mainly present in animal fat sources, while unsaturated fatty acids are primarily found in plant-based sources (1).

Within the group of unsaturated fatty acids, including alpha-linolenic acid (ALA) and linoleic acid (LA), classified as polyunsaturated fatty acids, are recognized as essential fatty acids. Polyunsaturated omega-6 (ω -6, n-6) and omega-3 (ω -3, n-3) fatty acids are essential for various functions in the body, including the synthesis of prostaglandins, cellular membranes,

phospholipids, cerebral gray matter, and sperm synthesis in the testes. Alpha-linolenic acid (18:3 n-3; ALA) belongs to the n-3 fatty acids, while linoleic acid (18:2 n-6; LA) belongs to the n-6 fatty acids (119). Commonly consumed sources of n-3 fatty acids include fatty fish, fish oil, walnuts, and flaxseeds. Commonly consumed sources of n-6 fatty acids include corn oil, soybean oil, sunflower oil, safflower oil, and cottonseed oil (107,118).

2.5.1.4 Vitamins

Vitamins belong to the group of micronutrients along with minerals. Although they are taken very small amounts, their health effects are crucial (118). Vitamins play a pivotal role in human health by supporting growth, facilitating the normal functioning of body systems, and enhancing the immune system. Their diverse functions underscore the integral role these micronutrients play in maintaining overall well-being and physiological balance. They are basically categorized into fat-soluble vitamins (vitamins A, D, E, and K) and water-soluble vitamins (B-complex vitamins and vitamin C). Fat-soluble vitamins have the ability to be stored in the body, whereas water-soluble vitamins cannot be stored due to their solubility in water, leading to their excretion through urine. Specifically, vitamin K can be obtained through dietary sources, and simultaneously, it can be produced by bacteria in the intestines. To maintain and sustain overall health, it is essential to be aware of vitamin sources and consume them in a balanced manner (1).

2.5.1.5 Minerals

Approximately 6% of the adult human body is composed of minerals (118). Minerals are required for the formation of bones and teeth, the maintenance of metabolism, and the promotion of a healthy lifestyle. Some key minerals are potassium, calcium, phosphorus, iron, sodium, magnesium, zinc, fluoride, copper, iodine, selenium, and chromium (1). They play crucial roles in the body's functioning.

- Calcium and magnesium are involved in the function of muscles and nerves.
- Calcium, phosphorus, and fluoride contribute to the formation of teeth and bones.
- Iron is essential for blood formation and oxygen transport.
- Iodine is necessary to produce thyroid hormones.
- Minerals like sodium, potassium, and chloride are vital for circulation.

These minerals are obtained from various foods and are excreted through urine, sweat, feces, and tears (120).

2.5.1.6 Phytochemicals

Phytochemicals are biologically active compounds sourced from plants, which are synthesized by plants for their own protection. They can be obtained from a variety of plant-based foods, and over a thousand phytochemicals have been identified. Among the significant ones are polyphenols, carotenoids, isoprenoids, dietary fibers, phytosterols, saponins, and certain polysaccharides. These phytochemicals are known for their potent antioxidant, antiviral, antimicrobial, and antiallergic properties. Phytochemicals contribute to diverse health benefits in the human body (121).

2.5.2 Factors Affecting Nutrition Knowledge Level

Proper nutrition knowledge plays a crucial role in achieving and maintaining good nutrition status (122,123). Nutrition knowledge level plays a significant role in shaping individuals' attitudes and eating behaviors (124). The nutritional knowledge level of each individual is important for overall health, but it holds additional significance for women. The level of nutritional knowledge not only impacts their general well-being but also plays a crucial role in the pregnancy process and, subsequently, the nutritional status of both them and their families. This is particularly significant for ensuring the continuity of healthy generations (123,125).

Sex, age, educational level, and socio-economic status are the factors that impact nutrition knowledge level. It has been reported that women tend to have higher levels of nutrition knowledge compared to men. Factors such as women being more active in grocery shopping and meal preparation; or men having less interest in nutrition, could be reasons for this disparity. Middle-aged individuals have a higher level of nutritional knowledge compared to both the younger and older populations. It has been reported that individuals with higher education levels (bachelor's degree or above vs. primary school or below) and socio-economic status have higher levels of nutrition knowledge (123,126).

2.5.3 Role of Nutrition Knowledge in Food Choices

Nutritional knowledge is a fundamental element in promoting behavior changes toward adopting healthier eating habits and food choices. Having higher levels of nutrition knowledge means individuals possess fundamental information to choose healthy foods, prepare and consume them in accordance with dietary guidelines, and understand the health consequences associated with consuming unhealthy foods. This contributes to the development of healthy eating habits (127).

High levels of nutrition knowledge are associated with a lower prevalence of obesity. This highlights the importance of informed food choices in supporting individuals in maintaining healthy BMI levels. On the other hand, individuals with higher educational degrees tend to have more knowledge about the nutritional quality of food, and they make higher-quality food choices. They have higher levels of preference to adhere to the dietary patterns of the Mediterranean diet (128).

The substantial differences in both food choices and nutrition knowledge observed across demographic characteristics suggest a potential correlation between both of them. This association may be influenced by their shared relationship with demographic factors, highlighting the intricate interplay between demographic characteristics, nutrition knowledge, and food choices (129).

2.6 Food Cravings

2.6.1 Understanding Food Choices Through Desire

Food choices can arise from various factors, such as desire. The desire to prefer one food over another can be viewed as a result of three major factors. The term "current internal state" denotes the immediate psychological or physiological condition. "Liking" describes the overall enjoyment derived from a particular food or food group. "Perceived appropriateness" denotes the context of use, such as the place or time where food is consumed (Figure 2.1) (37).

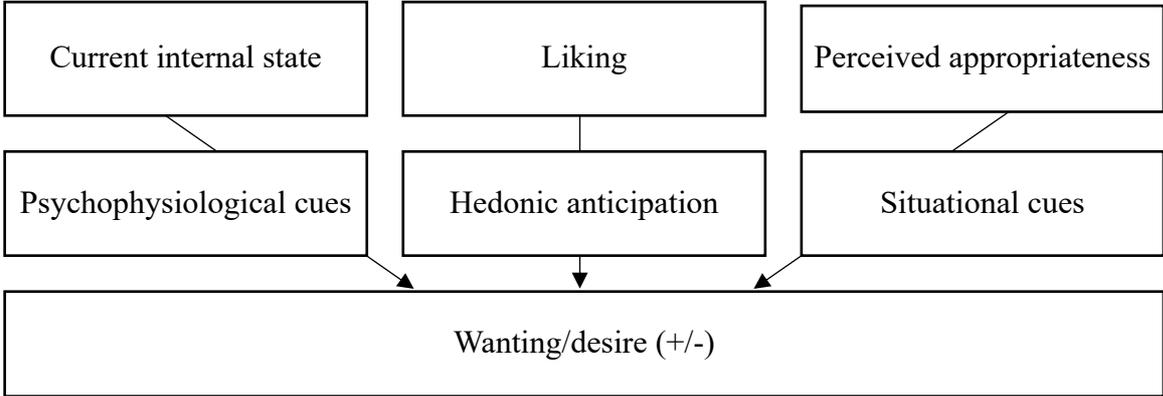


Figure 2.1 Schematic diagram of factors influencing the desire to eat a particular food.

Source: Mela DJ. Determinants of food choice: relationships with obesity and weight control. *Obes Res.* 2001;9 Suppl 4:249S-255S.

The momentary psychophysiological state can trigger a desire for specific foods. When considering basic needs, thirst is an example, but it can also encompass more subtle emotions, evaluating them in the form of need, such as with chocolate. The individual's exposure to specific foods, the environment, and the frequency of such experiences are determined by the

family environment, culture, and socioeconomic status. Preferences for and liking certain foods emerge at a very early age, but these hedonic responses can change over time with different experiences. Hedonic responses are not always sufficient to explain food choices because liking is not the same as desiring. It is crucial here whether a food matches the situation and context, as desire and liking can be strongly influenced by perceived appropriateness (37).

Food cravings represent hedonic responses to food, distinct from the more generalized sensations of hunger. They are characterized by their specificity and intense emotional experience linked to a particular type of food (130). From this perspective, it can be inferred that desire differs from craving, with part of this distinction stemming from variations in intensity and immediacy, as well as from diverse cognitive associations. In terms of eating behavior, this differentiation extends to the notions of "desire," "specific food desire," and "food craving" (Table 2.2) (131).

Table 2.2 Desire, specific desire, and food cravings.

Types of desire	Specificity	Factors		Cognitive aspect		Probability of consumption
		<i>Physiological</i>	<i>Affective</i>	<i>Positive</i>	<i>Negative</i>	
Desire	No	Maybe	Yes	Present	No	Low
Specific desire	Yes	Maybe	Yes	Present	No	Present and programmable
Food craving	Yes	Maybe	Intense	Present	Present and intense	High

Source: Oliveira J. The body asks and the mind judges: the episode of food craving, its triggers and nutritional treatment. Einstein (Sao Paulo). 2022;20:eMD6705.

2.6.2 Defining and Measuring Food Cravings

In everyday language, craving typically refers to a strong desire or yearning for a specific substance. Food craving is defined as an intense desire to eat a specific food (4). This specificity, described as an excessive desire for food, distinguishes the concept of "food craving" from the general consumption of any type of food (132).

Food craving is a multidimensional experience encompassing cognitive elements (e.g., thoughts about food), emotional components (e.g., a desire to eat or changes in mood), behavioral aspects (e.g., seeking and consuming food), and physiological elements (e.g., salivation) (132). For this reason, its measurement can be challenging. Examining cravings, particularly when studying alcohol cravings, consumption seems like a promising method for measuring cravings, but it has significant limitations. In order to address these limitations,

various initiatives have been undertaken, and psychophysiological measurements (such as heart rate) are one of them. Still, it is unclear whether the presence of these indicators is specific to alcohol cravings. It is also uncertain whether increased salivation signals the approach of food, if it serves as an indicator of food cravings, and whether it is specific to alcohol cravings (4). Craving does not necessarily equate to increased eating or consumption. In parallel, foods are often eaten without being desired, and desired foods are not always consumed. Hunger is not always a prerequisite for cravings (133).

The types of food cravings (Figure 2.2) have been extensively studied in the literature. Tonic craving denotes a general feeling experienced either over an extended period or in a specific moment, independent of environmental stimuli. It is frequently associated with abstaining from a specific food. Tonic craving is commonly assessed using multi-item self-report scales or questionnaires, including the Food Craving Inventory. Measures of tonic craving are often elevated in individuals with restrained eating habits and tend to rise after a period of deprivation. However, it's crucial to recognize that tonic craving differs from hunger and can occur even in the absence of energy requirements. Conversely, cue-induced craving represents a temporary phase of craving prompted by external stimuli in the environment (5).

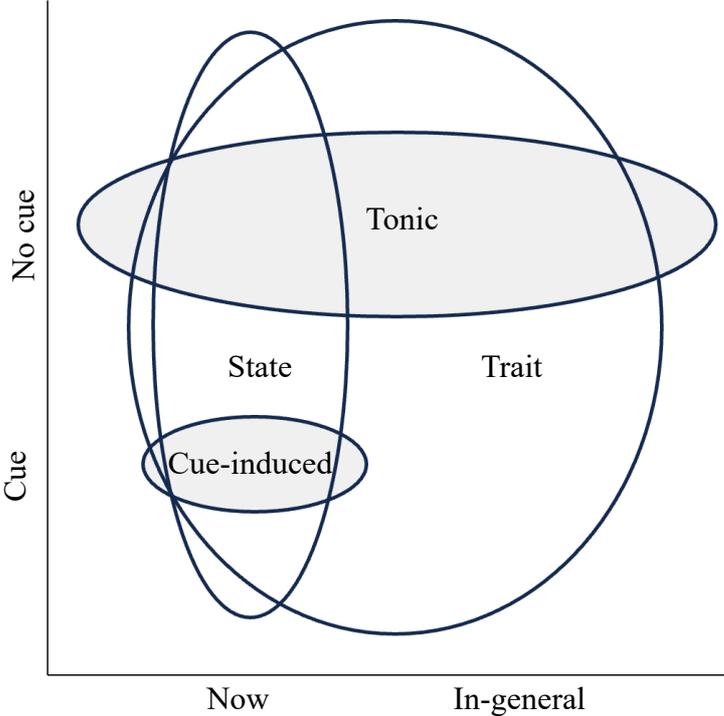


Figure 2.2 Conceptual overlap of commonly defined forms of food craving.

Source: Hallam J, Boswell RG, DeVito EE, Kober H. Gender-related Differences in Food Craving and Obesity. *Yale J Biol Med.* 2016;89(2):161–73.

Subjective self-reporting appears to be the most practical approach for assessing cravings, as other measurement methods (such as peripheral autonomic responses) often encounter challenges related to specificity (134). The FCI (Food Craving Inventory) is a valid self-reported measure that assesses the frequency of cravings for specific foods over the past month, categorizing them into four classes: high-fat foods, sweet foods, carbohydrate-rich foods/starches, and high-fat fast foods. When assessing cravings for different types of food groups, the FCI stands out as one of the most effective measurement methods (132).

2.6.3 The Role of Food Cravings in Disrupted Eating Behaviors

Food cravings can be a part of healthy eating behavior in individuals without any pathological urge, and they are experienced by more than 90% of the population (5). However, since food cravings are associated with highly energy-dense and excessively palatable foods, research suggests that pronounced food cravings are risk factors for bingeing and potentially leading to weight gain and obesity (135).

Individuals reporting food cravings tend to exhibit higher calorie intake independent of energy needs compared to those who rarely experience cravings (136). This heightened caloric consumption is indicative of the significant impact cravings can have on dietary patterns, potentially contributing to excess energy intake. Moreover, experiencing cravings for specific foods and food groups has been shown to predict the actual consumption of these items, emphasizing the behavioral influence of cravings on food choices and intake. Moreover, food cravings are linked to long-term weight outcomes, including increased weight gain over time and a higher lifetime BMI, further underlining their potential implications for overall health (137–139).

Food cravings are recognized as a trigger for binge episodes, acting as a precipitant that contributes to the initiation and escalation of compulsive overeating behaviors (140,141). In women following a diet, the weight cycle is associated with both increased frequency and intensity of food cravings. This relationship can extend to an increased likelihood of engaging in binge eating behaviors (142). Consequently, food cravings are linked to both binge eating and the psychopathology associated with EDs (143).

2.6.4 Sex Differences in Food Cravings

The global likelihood of women being overweight or obese is 3% higher than that of men (5). Considering the role of food cravings in obesity (135), sex-based differences in cravings can contribute to sex-based health inequalities. The type of craved food, the intensity and frequency of cravings, and the ability to regulate and cope with these cravings lead to sex

differences (5). Sex differences can also play a crucial role in the psychopathology of EDs and may contribute to variations in the type and quantity of food cravings. Hormonal changes associated with menstruation (144,145) and nutrition knowledge (146) are fundamental factors contributing to these variations.

Men tend to report a higher craving for savory foods, such as meat, fish, and egg dishes. In contrast, women express a greater craving for sweet foods, such as pastries and chocolate. Moreover, men may have distinct cravings for specific types of sweets, favoring items like sugar-sweetened beverages over chocolate, creating sex-based variations in food preferences (5,147,148). In general, women report experiencing stronger tonic and trait food cravings compared to men (149) and indicate that regulating food cravings may pose greater challenges for them (5).

2.6.5 Cultural Variations in Food Cravings

The cultural factor is at a very decisive point, especially when it comes to food cravings. It is known that different cultures tend to eat different foods, and individuals have cravings for foods from their own countries. According to Zellner et al. (1999), the fact that Spanish people like white chocolate more is consistent with white chocolate having a higher frequency of cravings in Spain (147). On the other hand, Komatsu (2008) reported that in Japan, where rice is grown and consumed extensively, women especially have a desire to eat "sushi" (8). Therefore, when examining food cravings, cultural factors play a crucial role.

2.7 The University Life and Its Distinctive Attributes

For many young people, leaving home for the first time is associated with going to university. During this period, they start living independently and making decisions for the first time without the guidance of their parents (14). This situation leads to significant lifestyle changes and can substantially alter eating behaviors. Overweight and obesity have the largest increase in the 18-29 age range, according to the Behavioral Risk Factor Surveillance System (150). Similarly, EDs usually begin in young adulthood (151,152).

It is known that university students tend to have less regular and less healthy eating patterns (14). University students are typically reported to have a desire for highly processed, flavorful foods that are high in refined carbohydrates, sugar, and fat (15,16). The increased consumption of these foods is positively associated with the risk of obesity (17,18,153). Additionally, with the influence of changing eating behaviors and other socio-economic factors, an increase in EDs can be observed during this period (154).

For these reasons, it is crucial to examine the relationship of food cravings to BMI, eating attitudes, and nutritional knowledge levels in university students who are at the greatest risk. In light of the insights derived from research findings, it is essential to create measures that account for the factors impeding healthy nutrition. The promotion of healthy eating among university students holds significant social importance, as it influences not only their current health but also serves as a model for future generations in cultivating healthy dietary habits (19).



3. MATERIALS AND METHODS

3.1 Participants

The study is designed to examine the relationship between food cravings and BMI, eating attitude, and nutrition knowledge level among undergraduate students studying at Yeditepe University.

The universe of this study consists of 14796 students. In order to reflect the number of university faculty students in the sample, it is aimed to reach the minimum numbers by convenience sampling method by weighting on the basis of 14 faculties at Yeditepe University. However, since the students of the Nutrition and Dietetics Department of the Faculty of Health Sciences are expected to have the highest level of nutritional knowledge, it is planned to be excluded from the study. The calculation of sample size was done according to the known sample calculation (Type 1 error was 5%, the confidence interval was 95%) and the minimum sample number is determined as 375 participants.

Hypotheses:

H0: There is no relationship of food cravings to body mass index, eating attitudes and nutritional knowledge levels.

H1: Individuals with high BMI (25 kg/m² and above) have higher food craving frequency scores.

H2: Individuals with abnormal eating attitudes have higher food craving frequency scores.

H3: Individuals with high nutritional knowledge have lower food craving frequency scores.

3.2 Data Collection

Data collection was done with a form that was printed and hand-delivered to the participants, and they were asked to fill out the volunteer form of consent after reading it. The average duration to complete the data collection form per participant was established as 10 minutes. Data collection was completed with 375 students from Yeditepe University undergraduate students who volunteered to engage in the study between March and November 2023.

Data collection form consisted of an informed consent form, demographic information, nutrition habits, Turkish version of Food Craving Inventory (FCI-TR, Eating Attitude Test short form (EAT-26) and Nutrition Knowledge Level Scale for Adults (YETBİD).

3.2.1 Data Collection Form

In the first part of the data collection form, the participant's age, sex, department, accomodation, smoking status, number of meals, and fluid consumption were questioned. Anthropometric measurements (height and weight) were also assessed based on individual statements. The BMI value of the participants was computed using the formula "Body Weight / (Height)² (kg/m²)" and obtained by the participants' self-reports.. BMI was then categorized according to the WHO classification (27).

In the second part of the form, there were 3 scales measuring food cravings, eating attitudes, and nutritional knowledge of the participants; the Turkish version of Food Craving Inventory (FCI-TR), Eating Attitude Test short form (EAT-26) and the Nutrition Knowledge Level Scale for Adults (YETBİD).

3.2.2 Scales

Turkish version of Food Craving Inventory (FCI-TR)

Several measurement tools are used to assess food cravings around the world. Food Craving Inventory (FCI) in its original form is a 28-item self-report measure that measures the frequency of cravings for certain foods. While experiencing food cravings may be universal, the specific foods desired can vary within cultural contexts. Therefore, the creators of the FCI have suggested adaptations of the inventory based on cultural context (16). In line with this, the Food Craving Inventory has been adapted to many cultures including Japan, Spain, United Kingdom, Germany, Brazil, and Iranian (8,155–159).

The validity and reliability of the Food Craving Inventory for Turkiye was established by İrem Çağla Özel et al. in 2022 as the Turkish Version of Food Craving Inventory (FCI-TR). The FCI-TR is a 27-item inventory consisting of eight items on the sweets subscale (chocolate, cake, cookie, ice cream, spreadable chocolate, sherbet desserts, sweetened beverages, jam/honey), eight items on the high fats subscale (cream, butter, sunflower seed, sauced wrap/doner, kebab, fried chicken, fried fish, kokorec), seven items on the carbohydrate/starches subscale (bread, rice, mashed potatoes, pasta, bagel, lahmacun, raw meatballs), and four items on the fast-food fats subscale (pizza, hamburger, french fries, chips). The scale measures the frequency of food cravings for certain foods that are commonly consumed in Turkish culture (160).

The food craving frequency scores of the participants were assessed using the FCI-TR. Participants first read the definition of food craving: "Food craving is defined as an intense and difficult-to-resist desire to consume a specific food." Then, the instructions were as follows:

"Please mark the appropriate option for each of the foods listed below. In the past month, how often did you crave each of the following foods?" Each food in the FCI-TR was scored on a 5-point Likert scale, ranging from 1 to 5. This scale was interpreted as follows for each food item: 1=never, 2=rarely, 3=sometimes, 4=often, and 5=always/almost every day. The total score was calculated by summing the scores obtained from the inventory divided by the number of items (160).

Eating Attitude Test short form (EAT-26)

The Eating Attitude Test-40 (EAT-40) was developed by Garner and Garfinkel in 1979 (161) and shortened to a 26-item version in 1982 by Garner, Olmstad, Bohr, and Garfinkel (162). Its Turkish validity and reliability were established in 2019 by Ergüney and colleagues as the Eating Attitudes Test Short Form (EAT-26) (163).

Eating attitudes of the participants were assessed using the EAT-26. The scale consists of 3 subscales: dieting behavior, bulimia, and preoccupation with food and controlling eating behavior. Dieting behavior encompasses questions 1, 6, 7, 10, 11, 12, 14, 16, 17, 22, 23, 24, and 26; bulimia includes questions 3, 4, 9, 18, 21, and 25; preoccupation with food and controlling eating behavior covers questions 2, 5, 8, 13, 15, 19, and 20. It was scored on a 6-point Likert scale (always, very often, often, sometimes, rarely, never). The responses for the first 25 items of the EAT-26 were scored as "3 = Always, 2 = Very often, 1 = Often, 0 = other options. However, reverse scoring is applied to question 26, where "1 = Sometimes, 2 = Rarely, and 3 = Never" are scored, while other options receive 0 points. The last section starting with "During the past 6 months" includes 5 items to assess disturbances in eating behavior during the past 6-month period. Although the scoring of this section is not included in the total score, it allows for the evaluation of current eating pathology. A score between 0 and 53 can be obtained from the scale, but 20 points is used as the cut-off point for EAT-26. Individuals scoring 20 or above are classified as having "impaired eating attitude", while those scoring below 20 are categorized as individuals with "normal eating attitude" (163).

Nutrition Knowledge Level Scale for Adults (YETBID)

The Nutrition Knowledge Level Scale for Adults (YETBID), developed by Hilal Batmaz in 2018, was created with the aim of introducing a valid and reliable scale to the literature to measure the nutrition knowledge level of adults (21).

Nutrition knowledge level of the participants was assessed using the YETBID. The "Basic Nutrition and Food-Health Relationship" section consists of 20 statements and the "Food Choice" section consists of 12 statements. Participants provided one of the following responses for each statement: "strongly agree, agree, neither agree nor disagree, disagree, strongly

disagree." For correct statements, participants who chose "strongly agree" received 4 points, "agree" received 3 points, "neither agree nor disagree" received 2 points, "disagree" received 1 point, and "strongly disagree" received 0 points. For incorrect statements, the scoring was reversed, participants who chose "strongly agree" received 0 points, "agree" received 1 point, "neither agree nor disagree" received 2 points, "disagree" received 3 points, and "strongly disagree" received 4 points. For "Basic Nutrition" section, score between 0 and 80 can be obtained and for "Food Choice" section, it is 0 and 48 (21).

3.3 Statistics

Statistical analyses were conducted using the SPSS software package (IBM SPSS Statistics 27). Frequency tables and descriptive statistics were used for interpreting the findings. Parametric methods were employed for measurement values that adhered to normal distribution. Accordingly, the Independent Samples t-test (t-table value) was utilized for comparing measurement values between two independent groups, while the ANOVA test (F-table value) was used for comparing measurement values among three or more independent groups. For measurement values that did not follow a normal distribution, non-parametric methods were applied. Thus, the Mann-Whitney U test (Z-table value) was employed for comparing measurement values between two independent groups, and the Kruskal-Wallis H test (χ^2 -table value) was used for comparing measurement values among three or more independent groups. Bonferroni correction was applied for pairwise comparisons of variables showing significant differences among three or more groups. All statistical test were conducted with the confidence interval 95% and p values below 0.05 were considered as significant.

3.4 Ethical

Ethical approval consent was taken from the Non-Interventional Clinical Research Ethics Committee of Yeditepe University with the decision numbered E.83321821-805.02.03-124 and dated 13.01.2023. The data collection process of the study was started after the approval of the ethics committee, also with the decision numbered E.18897253-302.14.01-1515 and dated 10.03.2023 by the Rectorate of the Yeditepe University, it was found appropriate to conduct this thesis study voluntarily with a sample of Yeditepe University undergraduate students

4. RESULTS

This chapter encompasses analyses that were conducted to test the hypotheses of the present study and presents the results of these analyses. Descriptive statistics were utilized to examine the demographic characteristics of the participants and to gain insights into their nutritional habits.

In the present study, sex, BMI classification, where they live, smoking status, meal frequency, and generally consumed meals were taken into consideration as demographic factors. Of the 375 participants, 65.1% were women and 34.9% were men (n=244, n=131; respectively). According to WHO's BMI classification 12.2% (n=46) of the participants were underweight, 60.0% (n=225) of them were normal, 22.7% (n=85) of them were pre-obese and 5.1% (n=19) of them were obese. It was found that 46.1% (n=173) of the participants lived with their family or relatives and 53.9% (n=202) of them live apart from their families. Additionally, 55.4% (n=208) of the participants did not smoke, 12.3% (n=46) of them quit smoking, and 32.3% (n=121) of them smoking. When the eating habits of the participants are considered, 38.7% (n=145) of the participants consumed 1-2 meals/day, 47.7% (n=179) of them consumed 3 meals/day, and 13.6% (n=51) of them consumed 4 and more meals/day. The most consumed meal by the participants is dinner with a rate of 95.5% (n=358). 83.5% (n=313) of the participants have normal eating behaviors and 16.5% (n=62) have impaired eating behaviors according to EAT-26 (Table 4.1).

Table 4.1 Distribution of descriptive characteristics of the sample.

	n	%
Sex		
Women	244	65.1
Men	131	34.9
BMI classification		
Underweight	46	12.2
Normal	225	60.0
Pre-obese	85	22.7
Obese	19	5.1
Accommodation		
At the student house alone	54	14.5
At the student house with my friends	14	3.7
My family	173	46.1
Dormitory	134	35.7
Smoking status		
No smoking	208	55.4
Quitted smoking	46	12.3
Smoking	121	32.3
Meal frequency per day		
1-2 meals	145	38.7
3 meals	179	47.7
4+ meals	51	13.6
Consumed meals per day*		
Breakfast	243	64.8
Brunch	28	7.5
Lunch	284	75.7
Afternoon	53	14.1
Dinner	358	95.5
Late night	76	20.3
EAT-26		
Normal eating attitude	313	83.5
Impaired eating attitude	62	16.5

*Multiple responses have been provided to the question, and percentages are determined based on the total sample size.

The distribution of descriptive characteristics of age, BMI, FCI-TR, EAT-26, and YETBID scores is showed in the Table 4.2. The mean age of the participants was 20.76 ± 2.18 (min:18-max:27). The mean BMI of the participants was 22.93 ± 3.99 (min:15.8-max:43.2).

The mean FCI-TR score of 375 participants was $2.48 \pm 0,55$ (min: 1.3-max:4.4).

Table 4.2 Descriptive quantitative properties of the sample.

		Mean	SD	Min.	Max.
Age		20.76	2.18	18	27
BMI		22.93	3.99	15.8	43.2
FCI-TR	Fast-food fats	2.75	0.75	1.0	5.0
	Sweets	2.56	0.75	1.0	5.0
	High fats	2.16	0.65	1.0	4.3
	Carbohydrates	2.58	0.69	1.0	4.4
	Total score	2.48	0.55	1.3	4.2
EAT-26	Dieting behavior	6.31	6.89	0.0	35.0
	Bulimic behavior	1.95	3.13	0.0	15.0
	Oral control behavior	3.31	3.19	0.0	17.0
	Total score	11.57	10.24	0.0	53.0
YETBID	Basic nutrition	54.20	8.26	19.0	76.0
	Food choice	36.83	6.55	0.0	48.0

Upon examining the Cronbach- α values as shown in Table 4.3, which represent the reliability coefficient for the scales, it was determined that the responses given to the scales were generally at a high level of reliability.

Table 4.3 Distribution of reliability coefficients for the scales.

		Number of items	Cronbach-α coefficient
FCI-TR	Fast-food fats	4	0.664
	Sweets	8	0.760
	High fats	8	0.700
	Carbohydrates	7	0.666
	Total	27	0.863
EAT-26	Dieting behavior	13	0.843
	Bulimic behavior	6	0.763
	Oral control behavior	7	0.615
	Total	26	0.843
	YETBID	Basic nutrition	20
Food choice		12	0.801

The scores for food cravings, eating attitudes, and nutritional knowledge level were evaluated based on sex in Table 4.4. According to FCI-TR scores, there were no statistically significant differences in terms of fast-food fats and sweets scores based on sex ($p > 0.05$). Statistically significant differences were found in high-fat scores ($Z = -6.810$; $p < 0.001$), carbohydrate scores ($Z = -3.412$; $p < 0.001$), and total scores ($t = -3.866$; $p < 0.001$) based on sex. The analysis revealed that men's scores for high fats, carbohydrates, and total FCI-TR scores were significantly higher compared to those of women.

According to EAT-26 scores, there were no statistically significant differences in terms of dieting behavior scores, oral control behavior scores, and total scores based on sex ($p > 0.05$). Statistically significant differences were found in bulimic behavior scores ($Z = -3.021$; $p = 0.003$) based on sex. It was determined that women's bulimic behavior scores were significantly higher than those of men.

According to YETBID scores, there were no statistically significant differences in terms of basic nutrition, and food choice scores based on sex ($p > 0.05$).

Table 4.4 Comparison of scale scores based on sex.

	Women (n=244)	Men (n=131)	Statistical analysis* p value
	$\bar{X} \pm SD$	$\bar{X} \pm SD$	
<u>FCI-TR</u>			
Fast-food fats	2.70±0.73	2.80±0.79	Z=-1.148 p=0.251
Sweets	2.55±0.73	2.57±0.77	Z=-0.516 p=0.606
High fats	1.99±0.57	2.48±0.67	Z=-6.810 p<0.001
Carbohydrates	2.50±0.66	2.73±0.72	Z=-3.412 p<0.001
Total score	2.39±0.50	2.62±0.59	t=-3.866 p<0.001
<u>EAT-26</u>			
Dieting behavior	6.61±7.16	5.75±6.35	Z=-0.811 p=0.418
Bulimic behavior	2.23±3.23	1.44±2.89	Z=-3.021 p=0.003
Oral control behavior	3.36±3.36	3.22±2.87	Z=-0.234 p=0.815
Total score	12.20±10.79	10.40±9.03	Z=-1.488 p=0.137
<u>YETBID</u>			
Basic nutrition	54.29±8.03	54.03±8.68	Z=-0.118 p=0.906
Food choice	37.29±6.22	35.96±7.06	Z=-1.780 p=0.075

*In the comparison of measurement values of two independent groups in data following a normal distribution, the "Independent Sample-t" test (t-table value) statistics were utilized. Conversely, in data not conforming to a normal distribution, the "Mann-Whitney U" test (Z-table value) statistics were employed for the comparison of measurement values of two independent groups.

The scores for food cravings, eating attitudes, and nutritional knowledge level were evaluated based on BMI classification in Table 4.5. According to FCI-TR scores, statistically significant differences were found in fast-food fats scores ($\chi^2=9.292$; $p=0.010$), high fats scores ($\chi^2=17.952$; $p<0.001$), and carbohydrates scores ($\chi^2=12.191$; $p=0.002$) based on BMI

classification. Following Bonferroni-corrected pairwise comparisons to determine the source of significant differences, it was found that significant differences existed between individuals categorized as normal weight and those classified as pre-obese/obese. Specifically, it was determined that FCI-TR fast-food fats, high fats and carbohydrates scores were significantly higher among individuals classified as pre-obese/obese compared to those categorized as normal weight. Also, statistically significant differences were found in sweets scores ($\chi^2=17.674$; $p<0.001$) based on BMI classification. Following Bonferroni-corrected pairwise comparisons to determine the source of significant differences, it was found that significant differences existed between individuals categorized as underweight and normal weight and those classified as pre-obese/obese. Specifically, it was determined that FCI-TR sweet scores were significantly higher among individuals classified as pre-obese/obese compared to those categorized as underweight and normal weight. Statistically significant differences were detected in FCI-TR total scores based on BMI classification ($F=15.150$; $p<0.001$). Following Tukey pairwise comparisons, considering the homogeneity of variances to determine the source of significant differences, it was found that significant differences existed between individuals categorized as underweight and normal weight and those classified as pre-obese/obese. Specifically, it was determined that FCI-TR total scores were significantly higher among individuals classified as pre-obese/obese compared to those categorized as underweight and normal weight.

According to EAT-26 scores, there were no statistically significant differences in terms of bulimic behavior based on BMI classification ($p>0.05$). Statistically significant differences were found in dieting behavior scores ($\chi^2=32.801$; $p<0.001$) based on BMI classification. Following Bonferroni-corrected pairwise comparisons to determine the source of significant differences, it was found that significant differences existed between individuals categorized as underweight and those classified as normal weight or pre-obese/obese. The dieting behavior scores of individuals classified as normal weight or pre-obese/obese were significantly higher compared to those categorized as underweight. Similarly, significant differences were found between individuals categorized as normal weight and those classified as pre-obese/obese, with the dieting behavior scores of individuals classified as pre-obese/obese were significantly higher compared to those categorized as normal weight. Statistically significant differences were found in oral control behavior scores ($\chi^2=37.861$; $p<0.001$) based on BMI classification. Following Bonferroni-corrected pairwise comparisons to determine the source of significant differences, it was found that significant differences existed between individuals categorized as underweight and those classified as pre-obese/obese. Specifically, the oral control behavior

scores of individuals classified as underweight were significantly higher compared to those categorized as pre-obese/obese. Statistically significant differences were found in YTT 26 total scores based on BMI classification ($\chi^2=8.031$; $p=0.018$). Following Bonferroni-corrected pairwise comparisons to determine the source of significant differences, it was found that significant differences existed between individuals categorized as normal weight and those classified as pre-obese/obese. Specifically, the YTT 26 total scores of individuals classified as pre-obese/obese were significantly higher compared to those categorized as normal weight.

According to YETBID scores, there were no statistically significant differences in terms of basic nutrition, and food choice scores based on BMI classification ($p>0.05$).

Table 4.5 Comparison of scale scores based on BMI classification.

	Underweight (n=46)⁽¹⁾	Normal (n=225)⁽²⁾	Pre-obese/Obese (n=104)⁽³⁾	Statistical analysis* p value
	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	
<u>FCI-TR</u>				
Fast-food fats	2.79±0.66	2.65±0.71	2.95±0.82	$\chi^2=9.292$ p=0.010 [2-3]
Sweets	2.50±0.63	2.45±0.70	2.82±0.81	$\chi^2=17.674$ p<0.001 [1,2-3]
High fats	2.17±0.56	2.04±0.56	2.42±0.79	$\chi^2=17.952$ p<0.001 [2-3]
Carbohydrates	2.67±0.61	2.48±0.64	2.77±0.76	$\chi^2=12.191$ p=0.002 [2-3]
Total score	2.48±0.45	2.37±0.48	2.71±0.64	F=15.150 p<0.001 [1,2-3]
<u>EAT-26</u>				
Dieting behavior	3.06±4.82	5.73±6.22	8.99±8.09	$\chi^2=32.801$ p<0.001 [1-2,3] [2-3]

Bulimic behavior	1.69±2.62	1.66±2.80	2.70±3.84	$\chi^2=5.439$ p=0.066
Oral control behavior	6.54±4.20	2.80±2.52	2.98±3.19	$\chi^2=37.861$ p<0.001 [1-3]
Total score	11.30±9.10	10.19±8.78	14.67±9.75	$\chi^2=8.031$ p=0.018 [2-3]
<u>YETBID</u>				
Basic nutrition	53.19±7.89	54.91±7.23	53.09±9.99	$\chi^2=2.150$ p=0.341
Food choice	35.47±4.57	37.43±5.68	36.13±8.61	$\chi^2=5.495$ p=0.064

* In data with a normal distribution, the "ANOVA" test (F-table value) statistics were employed for comparing measurement values of three or more independent groups. Conversely, in data not conforming to a normal distribution, the "Kruskal-Wallis H" test (χ^2 -table value) statistics were utilized for comparing measurement values of three or more independent groups.

The scores for food cravings, eating attitudes, and nutritional knowledge level were evaluated based on smoking status in Table 4.6. According to FCI-TR scores, there were no statistically significant differences in terms of fast-food fats, sweets, high fats, carbohydrates, and total scores based on smoking status ($p>0.05$).

According to EAT-26 scores, there were no statistically significant differences in terms of bulimic behavior, oral control behavior, and total scores based on smoking status ($p>0.05$). Statistically significant differences were found in dieting behavior scores ($\chi^2=7.410$; $p=0.025$) based on smoking status. Following Bonferroni-corrected pairwise comparisons to determine the source of significant differences, it was found that significant differences existed between non-smokers and former smokers. Specifically, the dieting behavior scores of former smokers were significantly higher compared to non-smokers.

According to YETBID scores, there were no statistically significant differences in terms of basic nutrition scores based on smoking status ($p>0.05$). Statistically significant differences were found in food choice scores ($\chi^2=6.019$; $p=0.049$) based on smoking status. Following Bonferroni-corrected pairwise comparisons to determine the source of significant differences, it was found that significant differences existed between non-smokers and smokers. Specifically, the food choice scores of smokers were significantly higher compared to non-smokers.

Table 4.6 Comparison of scale scores based on smoking status.

	No smoking (n=208)⁽¹⁾	Quitted smoking (n=46)⁽²⁾	Smoking (n=121)⁽³⁾	Statistical analysis*
	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	p value
<u>FCI-TR</u>				
Fast-food fats	2.66±0.74	2.88±0.76	2.83±0.75	$\chi^2=5.854$ p=0.054
Sweets	2.57±0.77	2.56±0.70	2.54±0.72	$\chi^2=0.003$ p=0.998
High fats	2.13±0.61	2.20±0.67	2.21±0.71	$\chi^2=1.095$ p=0.578
Carbohydrat es	2.55±0.66	2.68±0.68	2.60±0.73	$\chi^2=1.339$ p=0.512
Total score	2.45±0.53	2.53±0.54	2.50±0.58	F=0.683 p=0.506
<u>EAT-26</u>				
Dieting behavior	5.75±6.36	8.73±7.82	6.36±7.25	$\chi^2=7.410$ p=0.025 [1-2]
Bulimic behavior	1.69±2.82	2.91±4.01	2.04±3.23	$\chi^2=2.724$ p=0.256
Oral control behavior	3.51±3.29	3.00±2.89	3.07±3.13	$\chi^2=2.144$ p=0.342
Total score	10.95±9.72	14.65±11.61	11.47±10.44	$\chi^2=4.893$ p=0.087
<u>YETBID</u>				
Basic nutrition	53.99±8.13	55.89±8.16	53.91±8.50	$\chi^2=3.530$ p=0.171
Food choice	35.47±5.60	36.58±7.74	37.55±7.50	$\chi^2=6.019$ p=0.049 [1-3]

*In data with a normal distribution, the "ANOVA" test (F-table value) statistics were utilized for comparing measurement values of three or more independent groups. Conversely, in data not conforming to a normal distribution, the "Kruskal-Wallis H" test (χ^2 -table value) statistics were employed for comparing measurement values of three or more independent groups.

There were no statistically significant differences in terms of FCI-TR fast-food fats, sweets, high fats, carbohydrates, FCI total score, and YETBID basic nutrition and food choice scores based on eating attitude status ($p>0.05$). The eating attitude status based on EAT-26 is similar in the specified characteristics (Table 4.7).

Table 4.7 Comparison of scale scores based on eating attitude status.

	Normal eating	Impaired eating	Statistical analysis*
	attitude (n=313)	attitude (n=62)	
	$\bar{X} \pm SD$	$\bar{X} \pm SD$	p value
<u>FCI-TR</u>			
Fast-food fats	2.73±0.69	2.76±1.01	Z=-0.061 p=0.952
Sweets	2.56±0.72	2.51±0.83	Z=-0.821 p=0.412
High fats	2.18±0.61	2.07±0.82	Z=-1.841 p=0.066
Carbohydrates	2.57±0.67	2.64±0.74	Z=-0.525 p=0.600
Total score	2.48±0.52	2.45±0.65	Z=-1.030 p=0.303
<u>YETBID</u>			
Basic nutrition	54.58±7.55	52.31±11.03	Z=-0.958 p=0.338
Food choice	36.83±5.96	36.80±8.99	Z=-1.113 p=0.266

*In data not conforming to a normal distribution, the "Mann-Whitney U" test (Z-table value) statistics were employed for comparing measurement values of two independent groups.

A statistically significant positive correlation at a very weak/weak level was identified ($p<0.05$) between BMI with fast-food fats, sweets, high fats, carbohydrates, FCI-TR total score, dieting behavior, bulimic behavior, and EAT-26 total score. As fast-food fats, sweets, high fats, carbohydrates, FCI-TR total score, dieting behavior, bulimic behavior, and YTT 26 total score increase, BMI is expected to increase.

A statistically significant negative correlation at a very weak level was detected ($p < 0.05$) between BMI and oral control behavior. As oral control behavior score increases, BMI is expected to decrease.

Table 4.8 Examining the relationships between quantitative findings and scales.

Correlation* (n=375)			BMI (kg/m ²)	Ideal weight (kg)	Highest weight (kg)	Lowest weight (kg)	Consumed amount of water (liters/day)	
FCI-TR	Fast-food fats	r	0.128	0.061	0.068	0.090	-0.086	
		p	0.013	0.342	0.236	0.123	0.098	
	Sweets	r	0.139	0.045	0.053	0.094	-0.035	
		p	0.007	0.487	0.358	0.105	0.498	
	High fats	r	0.158	0.314	0.207	0.274	0.113	
		p	0.002	<0.001	<0.001	<0.001	0.029	
	Carbohydrates	r	0.108	0.198	0.114	0.114	0.121	
		p	0.036	0.002	0.048	0.051	0.019	
	Total score	r	0.163	0.201	0.139	0.179	0.048	
		p	0.002	0.002	0.015	0.002	0.358	
EAT-26	Dieting behavior	r	0.341	0.056	0.301	0.191	0.223	
		p	<0.001	0.386	<0.001	<0.001	<0.001	
	Bulimic behavior	r	0.104	-0.076	0.045	-0.020	-0.082	
		p	0.044	0.240	0.427	0.726	0.114	
	Oral control behavior	r	-0.227	-0.068	-0.166	-0.178	-0.046	
		p	<0.001	0.293	0.004	0.002	0.376	
	Total score	r	0.123	-0.038	0.106	0.016	0.086	
		p	0.017	0.558	0.063	0.783	0.095	
	YETBID	Basic nutrition	r	-0.015	-0.098	-0.047	-0.073	0.032
			p	0.773	0.129	0.407	0.207	0.538
Food choice		r	0.051	-0.093	-0.020	-0.024	-0.027	
		p	0.324	0.148	0.733	0.678	0.597	

*In cases where at least one of the two quantitative variables do not adhere to a normal distribution, the Spearman correlation coefficient is utilized for assessing the relationship between them.

A statistically significant negative correlation at a very weak level was found ($p < 0.05$) between dieting behavior and high fats, as well as between dieting behavior and FCI-TR total score. As high fats and FCI-TR total score increase, dieting behavior is expected to decrease.

A statistically significant positive correlation at a very weak level was found ($p < 0.05$) between bulimic behavior and fast-food fats, sweets, as well as between bulimic behavior and FCI-TR total score. As fast-food fats, sweets, and FCI-TR total score increase, bulimic behavior is expected to increase.

A statistically significant negative correlation at a very weak level was found ($p < 0.05$) between basic nutrition and fast-food fats, sweets, high fats, carbohydrates, and FCI-TR total score. As fast-food fats, sweets, high fats, carbohydrates, and FCI-TR total score increase, the basic nutrition score is expected to decrease.

A statistically significant negative correlation at a very weak level was identified ($p < 0.05$) between food choice and sweets, high fats, carbohydrates, and FCI-TR total score. As sweets, high fats, carbohydrates, and FCI-TR total score increase, the food choice score is expected to decrease.

Table 4.9 Examining the relationships between food cravings and other scales.

Correlation* (n=375)		FCI-TR					
		Fast-food fats	Sweets	High fats	Carbohydrates	Total score	
EAT-26	Dieting behavior	r	-0.089	-0.099	-0.119	-0.061	-0.128
		p	0.086	0.055	0.021	0.240	0.013
	Bulimic behavior	r	0.124	0.199	-0.003	0.078	0.139
		p	0.017	<0.001	0.949	0.131	0.007
	Oral control behavior	r	0.020	-0.072	0.018	0.000	-0.024
		p	0.694	0.167	0.724	0.994	0.636
	Total score	r	-0.004	-0.011	-0.064	-0.018	-0.036
		p	0.933	0.831	0.128	0.735	0.488
YETBID	Basic nutrition	r	-0.187	-0.149	-0.130	-0.127	-0.174
		p	<0.001	0.004	0.011	0.014	<0.001
	Food choice	r	-0.077	-0.128	-0.207	-0.169	-0.195
		p	0.139	0.013	<0.001	0.001	<0.001

*In cases where at least one of the two quantitative variables do not comply with normal distribution, the "Spearman" correlation coefficient was used.

5. DISCUSSION

In this study, the eating attitudes and nutritional knowledge levels of university students were examined through their levels of food cravings. Whether there are differences according to BMI, eating attitudes, nutrition knowledge level and their relationships with food cravings were investigated.

University students were specifically chosen as the sample because studies showed that they tend to eat less regular and less healthy foods (14). It is observed in the relevant literature that university students typically have cravings for highly processed, delicious foods containing high levels of refined carbohydrates, sugars, and fats (15,16). High consumption of these nutrients is positively associated with the risk of obesity (17,18,153). When considered in terms of eating attitudes, research shows that eating attitudes in this demographic group significantly affect not only their physical health but also their mental and emotional health. Positive eating attitudes, characterized by a balanced approach to food consumption and a healthy relationship with eating habits, are associated with better academic performance, higher energy levels and improved mood (164,165). In Turkey, the range of eating attitudes among university students has been found to vary between 4.83% and 17.1% (166). Studies also have highlighted that insufficient nutritional knowledge is a crucial factor hindering individuals from making healthy dietary choices. Having poor nutritional knowledge tends to steer students towards skipping meals, consuming fewer fruits and vegetables, and increasing fast-food consumption. These unhealthy eating habits can lead students to consume nutritionally poor foods, intake more sugar, fat, and salt, and consequently increase their risk of chronic diseases and health issues later in life (167).

This thesis was conducted with 375 university students studying in different faculties. In this study, the mean FCI-TR score of 375 participants was 2.48 ± 0.55 . The mean fast-food fats score was 2.75 ± 0.75 , the mean sweets score was 2.56 ± 0.75 , the mean high fats score was 2.16 ± 0.65 , and the mean carbohydrates score was 2.58 ± 0.69 . The mean BMI of the participants was 22.93 ± 3.99 kg/m². Among the 375 students, 12.2% of them were categorized as underweight, 60% of them were as normal weight, 22.7% of them were pre-obese, and 5.1% of them were as obese. The majority of the group fell within the normal range according to the BMI classification by WHO (27). Examining the relevant literature, it was found that the frequency, intensity and types of food cravings differ between different BMI classes (9,168). Regularly craving particular foods or food categories (termed tonic cravings) indicates a likelihood of consuming those certain foods. Both tonic and trait cravings for food are linked to enduring weight-related outcomes, such as gradual weight gain and a higher lifetime BMI

(137–139). In this study, when comparing food craving levels based on BMI classification, individuals classified as pre-obese and obese class tend to exhibit higher levels of total food cravings ($p < 0.001$). Also, there is a significant positive correlation was identified ($p < 0.05$) between BMI with fast-food fats, sweets, high fats, carbohydrates, FCI-TR total scores. In 2002, White et al. developed and validated the Food Craving Inventory and they found that there is a significant relationship between fat cravings and high BMI levels (16). In 2014, Chao et al. conducted a study with 646 participants by using FCI to examine the relationship between the frequency of food cravings and BMI for different food categories. Consistent with this study, they found that individuals with higher BMIs experience more frequent food cravings. Additionally, they noted significant associations between cravings for high-fat foods, sweets, fast-food fats, and carbohydrates/starches, and increased consumption of these food groups (169).

The relationship between obesity and eating disorders is a subject that has been researched, especially among university students, who are defined as a high-risk group. In 2020, Naguib et al. conducted a cross-sectional study among 550 university students to assess the correlation between BMI and eating attitudes by using EAT-26. The prevalence of disordered eating attitudes was highest among the obese group compared to other BMI categories ($p < 0.05$). There was a positive correlation between the percentage of disordered eating attitude scores and BMI: 35.2% versus 52.3% among underweight and individuals with obesity, respectively ($p = 0.001$) (66). Çelebi et al. (2023) conducted a study with 628 university students, examining the relationship between students' irregular eating attitudes, their level of nutritional knowledge, and overweight and obesity (170). A positive correlation was noted between eating attitude scores and BMI. Consequently, university students with less favorable eating attitudes and behaviors faced an increased risk of being overweight or obese. Individuals with high disordered eating scores were determined to be 3.5 times more likely to be overweight or obese. Piko et al. (2022) conducted a study with 261 university students to examine the disordered eating and weight-related correlations by using EAT-26. They found that disordered eating scores were linked to 1.11 times increased risk of obesity (171). Similar to the examined relevant literature, this study found that individuals classified as pre-obese and obese had significantly higher scores in dietary behavior, oral control behavior, and total EAT-26 scores. Also, a statistically significant positive correlation was identified ($p < 0.05$) between BMI with dieting behavior, bulimic behavior, and EAT-26 total score.

In this study, the sex factor was examined with other factors. Among the 375 students surveyed, 65.1% were women and 34.9% were men. Men's food craving levels for general

cravings, high-fat foods (e.g., kebab, kokorec, fried chicken), and carbohydrates (e.g. lahmacun, pasta, rice) were higher than women, and this difference was found to be significant ($p < 0.001$). As a result, this study demonstrates that sex influences food cravings. In 1999, Zellner et al. conducted a cross-cultural study with 418 subjects. Similar to our study, men tend to crave savory foods more than women, according to the findings of this study (147). Similarly, Aliasghari et al. (2019) showed that high-fat foods subscales were significantly higher in men than women by adapting FCI to the Iranian population. However, they showed that women might experience general food cravings, sweets, fast-food fats, and carbohydrates to a greater extent compared to men, unlike our study (159). In summary, according to studies, there were differences in food craving levels on a sex basis.

In this study, the bulimic behavior scores among women are significantly higher compared to those among men ($p = 0.003$). For dieting behavior, oral control behavior, and total scores, there were no statistically significant differences based on sex ($p > 0.05$). In 2019, Akdevelioğlu and Yörüsün examined the eating attitudes and behaviors of university students by using EAT-26. Among the 339 students surveyed, 48.1% were men and 51.9% were women. The study identified a risk of eating behavior disorder in 26.5% of the population. They demonstrated that the risk of eating behavior disorders and emotional eating behavior was notably higher in women than in men ($p < 0.05$) (172). Çelebi et al. (2023) observed that, EAT-26 scores were significantly higher in women among 628 university students ($p < 0.001$) (170). Examined relevant literature and this study findings support that there is a prevailing trend indicating a higher prevalence of impaired eating attitudes and behaviors among women.

In this study, 32.3% of the participants were smokers, 12.3% of them were former smokers, and 55.4% of them were non-smokers. Some studies suggest that nicotine may increase the desire for highly palatable foods (173,174). In 2017, Chao et al. conducted a study with 712 volunteers by using FCI to examine the relationship between smoking status and food cravings. They showed that nicotine addiction is positively associated with overall food cravings and the frequency of cravings for high fats, sweets, and carbohydrates/starches. Smokers were more likely to crave high fat foods and fast-food fats compared to non-smokers (175). Unlikely, in this study, there were no statistically significant differences in terms of fast-food fats, sweets, high fats, carbohydrates, and total scores based on smoking status ($p > 0.05$).

In this study, the mean of the EAT-26 score was determined as 11.57 ± 10.24 . The majority of the group (83.5%) exhibit healthy eating attitudes. 16.5% of the 375 participants

have impaired eating attitudes. In order to prevent eating disorders, it is crucial to determine risk groups by evaluating impaired eating attitudes (163). When examining the food cravings based on eating disorders, Oliveira and Cordas (2020) showed that the lowest levels of food cravings are observed in individuals with AN, followed by a gradual increase in BN, and the highest levels are evident in those with BED (176). In this study, in addition to items expressing attitudes towards vomiting behavior such as 'I vomit after eating' and 'I feel like vomiting after meals' which are included in the bulimic behavior factor in EAT-26, there is a single reverse-scored item 'I enjoy trying sugary, fatty foods'. As expected, positive correlation was found ($p < 0.05$) between bulimic behavior and fast-food fats, sweets, as well as between bulimic behavior and FCI-TR total score. As fast-food fats, sweets, and FCI-TR total score increase, bulimic behavior is expected to increase. On the other hand, a significant negative correlation at a very weak level was found ($p < 0.05$) between dieting behavior and high fats, as well as between dieting behavior and FCI-TR total score. This situation may stem from an attitude suggesting that high-fat foods can override dieting behavior, but further research is needed to confirm this suggestion.

In this study, the mean of the YETBID scores for basic nutrition was 54.20 ± 8.26 , and for food choice was 36.83 ± 6.55 . Having nutritional knowledge is crucial for cultivating healthy eating habits and making healthier food choices. Çelebi et al. (2023) observed that irregular eating attitudes and poor nutritional knowledge levels were significantly more prevalent among overweight or individuals with obesity (170). In 2009, Şanlıer et al. conducted a study to identify the BMI of 1340 university students and to examine the relationship between nutritional knowledge and dietary behaviors. It was found that women had higher scores in nutritional behavior and nutritional knowledge compared to men, and this difference was statistically significant ($p < 0.05$). However, despite the lower scores in nutritional behavior, habits, and knowledge according to BMI, no statistically significant difference was found ($p > 0.05$) (177). According to Kristal et al. (1990), there is a significant negative relationship between nutritional knowledge and fat intake (178). Similarly, Sharma et al. (2008) showed that nutrition knowledge level is a robust predictor of eating behavior across all food groups except for fruits and vegetables (179). Although food craving does not always result in the act of taking food, it adopts the perspective that the craving is an internal experience with cognitive and emotional (drive or motivation) properties (16). In this study, there is no significant relationship between BMI and nutritional knowledge levels. According to this study, there is no significant difference in nutritional knowledge levels either in terms of BMI or sex ($p > 0.05$).

6. CONCLUSION AND RECOMMENDATIONS

Food cravings for food among university students have become prevalent phenomena. These students often find themselves longing for a variety of culinary delights, which can significantly impact their daily lives. While these cravings offer a sense of satisfaction, they also pose challenges in terms of managing body weight, emotions, dietary choices and overall well-being.

Cultural factors significantly influence food cravings, with different cultures desiring their own traditional foods. It's important to study the frequency of these cravings in students to identify potentially problematic foods linked to poor eating habits. Recognizing these risks can help develop activities to improve students' eating attitudes and nutritional knowledge. It is an issue that needs to be investigated.

In this study, overall BMI values were found to be within normal limits. Food cravings levels were also very close to the average value. However, these results alone are insufficient for drawing definitive conclusions. When looked at on the basis of students studying in higher education, impaired eating attitudes and inadequate levels of nutritional knowledge levels should be considered as a significant problem.

As a result of the study, it was concluded that food craving levels can differ according to gender, BMI, and impaired eating attitudes, though not with nutrition knowledge level and smoking status. The research also found that the sub-dimensions of the EAT-26 varied based on gender, BMI, and the sub-groups of the FCI-TR. These findings suggest that food cravings may serve as a predictor of obesity risk factors and unhealthy eating attitudes. Therefore, it is imperative that further research is conducted to explore these associations more comprehensively and to understand the underlying mechanisms.

The limitations of this study are limited to the responses provided to the FCI-TR, EAT-26, YETBID, and personal information form. This study encapsulates the viewpoints, perceptions, and reflections of the interviewed university students within the temporal scope of their responses and lacks the capacity to ascertain potential longitudinal terms.

Within this study, valuable insights were gained on these topics, with an effort to enrich the existing literature. It is anticipated that our research will provide insights for future inquiries and underscore the necessity for further exploration in this area.

Based on the findings from the study, training university students to gain awareness about food cravings, develop healthy eating attitudes, and increase their nutritional knowledge is essential for fostering long-term health and well-being. University life is often associated with irregular eating patterns, stress-induced cravings, and limited access to nutritious meals,

which can contribute to poor dietary habits and subsequent health issues. By implementing structured educational programs focused on nutrition, students can learn to identify and understand their cravings, make informed food choices, and adopt sustainable, healthy eating behaviors. Additionally, increasing the availability of healthy meal options and encouraging their consumption in campus cafeterias and dining halls, where students frequently spend time, could also be beneficial. Moreover, integrating such training into the university curriculum or as part of campus wellness initiatives can create a supportive environment that encourages positive lifestyle changes. Enhancing students' nutritional knowledge not only benefits their immediate academic performance and physical health but also instills lifelong habits that reduce the risk of chronic diseases.

Consequently, universities have a critical role in promoting nutritional literacy and healthy eating practices among their students, ultimately contributing to a healthier, more informed society. Preventive education and measures for eating behavior disorders should be established, with treatment available for those already affected. Long-term studies on undiagnosed or subclinical disorders in young people and screenings for high-risk groups are recommended. Conferences and seminars should also be held to educate and raise awareness among children, adolescents, parents, and educators.

7. REFERENCES

1. Baysal A. Genel Beslenme. 16'ncı bas. Ankara: Hatiboğlu; 2016.
2. Canetti L, Bachar E, Berry EM. Food and emotion. *Behav Processes*. 2002;60(2):157–64.
3. Mehrabian A. Basic dimensions for a general psychological theory: Implications for personality, social, environmental, and developmental studies. *J Pers Assess*. 1980;657–8.
4. Weingarten HP, Elston D. The phenomenology of food cravings. *Appetite*. 1990;15(3):231–46.
5. Hallam J, Boswell RG, DeVito EE, Kober H. Gender-related Differences in Food Craving and Obesity. *Yale J Biol Med*. 2016;89(2):161–73.
6. Alvarenga MS, Koritar P, Pisciolaro F, Mancini M, Cordás TA, Scagliusi FB. Eating attitudes of anorexia nervosa, bulimia nervosa, binge eating disorder and obesity without eating disorder female patients: Differences and similarities. *Physiol Behav*. 2014;131:99–104.
7. White MA, Grilo CM. Psychometric properties of the Food Craving Inventory among obese patients with binge eating disorder. *Eat Behav*. 2005;6(3):239–45.
8. Komatsu S. A preliminary study of food craving among Japanese females. *Appetite*. 2008;50(2–3):353–8.
9. Gendall KA, Joyce PR, Sullivan PF, Bulik CM. Food cravers: characteristics of those who binge. *Int J Eat Disord*. 1998;23(4):353–60.
10. Alpaslan AH, Koçak U, Avcı K, Taş HU. The association between internet addiction and disordered eating attitudes among Turkish high school students. *Eat Weight Disord*. 2015;20(4):441–8.
11. Tokgöz P, Ertem M, Çelik F, Gökçe Ş, Saka G, Hatunoğlu R. Üniversite öğrencilerinin beslenme alışkanlıklarının saptanmasına ilişkin bir araştırma. *Beslenme ve Diyet Derg*. 1995;24(2):229–38.
12. Koçoğlu G, Sümer H, Özdemir L, Polat H. Spor bölümü öğrencilerinin beslenme durumları ve alışkanlıkları diğer öğrencilerden farklı mı? *Sendrom*. 2001;74–80.
13. Sağlam F, Yurttagül M. Yükseköğrenime devam eden kız öğrencilerin başarı ve beslenme durumları arasındaki ilişki. *Beslenme ve Diyet Derg*. 1987;16(1):17–24.
14. Maillet MA, Grouzet FME. Understanding changes in eating behavior during the transition to university from a self-determination theory perspective: a systematic review. *J Am Coll Health*. 2023;71(2):422–39.
15. Weingarten HP, Elston D. Food cravings in a college population. *Appetite*. 1991;17(3):167–75.
16. White MA, Whisenhunt BL, Williamson DA, Greenway FL, Netemeyer RG. Development and validation of the food-craving inventory. *Obes Res*. 2002;10(2):107–14.
17. Faruque S, Tong J, Lacmanovic V, Agbonghae C, Minaya D, Czaja K. The Dose Makes the Poison: Sugar and Obesity in the United States – a Review. *Pol J Food Nutr Sci*. 2019;69(3):219–33.

18. Louzada ML, Baraldi LG, Steele EM, Martins AP, Canella DS, Moubarac JC, et al. Consumption of ultra-processed foods and obesity in Brazilian adolescents and adults. *Prev Med (Baltim)*. 2015;81:9–15.
19. Vançelik S, Önal SG, Güraksın A, Beyhun E. Üniversite öğrencilerinin beslenme bilgi ve alışkanlıkları ile ilişkili faktörler. *TSK Koruyucu Hekim Bülteni*. 2007;6(4):242–8.
20. Aytekin F, Bulduk S. Üniversite öğrencilerine verilen eğitim modellerinin öğrencilerde davranış değişikliğine etkilerinin incelenmesi. *Milli Eğitim Derg*. 2000;148:1–5.
21. Batmaz H. Yetişkinler için beslenme bilgi düzeyi ölçeği geliştirilmesi ve geçerlik-güvenirlilik çalışması. Marmara Üniversitesi; 2018.
22. O'Brien G, Davies M. Nutrition knowledge and body mass index. *Health Educ Res*. 2007;22(4):571–5.
23. Valmórbida JL, Goulart MR, Busnello FM, Pellanda LC. Nutritional knowledge and body mass index: A cross-sectional study. *Rev Assoc Med Bras*. 2017;63(9):736–40.
24. World Health Organization. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. *World Heal Organ Tech Rep Ser*. 2000;894.
25. National Institutes of Health. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: The evidence report. *Obes Res*. 1998;6(2):51S-209S.
26. Centers for Disease Control and Prevention. About Adult BMI [Internet]. 2022. Available from: https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html
27. World Health Organization/Europe. A healthy lifestyle - WHO recommendations [Internet]. 2010 [cited 2024 Jan 22]. Available from: <https://www.who.int/europe/news-room/fact-sheets/item/a-healthy-lifestyle---who-recommendations>.
28. Klatsky AL, Zhang J, Udaltsova N, Li Y, Tran HN. Body Mass Index and Mortality in a Very Large Cohort: Is It Really Healthier to Be Overweight? *Perm J*. 2017;21:16–142.
29. Aune D, Sen A, Prasad M, Norat T, Janszky I, Tonstad S, et al. BMI and all cause mortality: systematic review and non-linear dose-response meta-analysis of 230 cohort studies with 3.74 million deaths among 30.3 million participants. *BMJ*. 2016;353:i2156.
30. Abdelaal M, le Roux CW, Docherty NG. Morbidity and mortality associated with obesity. *Ann Transl Med*. 2017;5(7):161.
31. Khan SS, Ning H, Wilkins JT, Allen N, Carnethon M, Berry JD, et al. Association of Body Mass Index With Lifetime Risk of Cardiovascular Disease and Compression of Morbidity. *JAMA Cardiol*. 2018;3(4):280–7.
32. Gray N, Picone G, Sloan F, Yashkin A. Relation between BMI and diabetes mellitus and its complications among US older adults. *South Med J*. 2015;108(1):29–36.
33. Akirov A, Shochat T, Masri-Iraqi H, Dicker D, Diker-Cohen T, Shimon I. Body mass index and mortality in patients with and without diabetes mellitus. *Diabetes Metab Res Rev*. 2018;34(4):e2979.
34. Pasanta D, Tungjai M, Chancharunee S, Sajomsang W, Kothan S. Body mass index and its effects on liver fat content in overweight and obese young adults by proton magnetic resonance spectroscopy technique. *World J Hepatol*. 2018;10(12):924–33.

35. Borrell LN, Samuel L. Body mass index categories and mortality risk in US adults: the effect of overweight and obesity on advancing death. *Am J Public Health*. 2014;104(3):512–9.
36. Turkish Statistical Institute. Turkey Health Survey 2022 [Internet]. TUIK. 2022. Available from: <https://data.tuik.gov.tr/Bulten/Index?p=Turkiye-Health-Survey-2022-49747&dil=2>
37. Mela DJ. Determinants of food choice: relationships with obesity and weight control. *Obes Res*. 2001;9 Suppl 4:249S-255S.
38. Bartoshuk LM, Duffy VB, Hayes JE, Moskowitz HR, Snyder DJ. Psychophysics of sweet and fat perception in obesity: problems, solutions and new perspectives. *Philos Trans R Soc Lond B Biol Sci*. 2006;361(1471):1137–48.
39. Dressler H, Smith C. Food choice, eating behavior, and food liking differs between lean/normal and overweight/obese, low-income women. *Appetite*. 2013;65:145–52.
40. Sung J, Lee K, Song Y-M. Relationship of eating behavior to long-term weight change and body mass index: the Healthy Twin study. *Eat Weight Disord*. 2009;14(2–3):e98–105.
41. Steinle NI, Hsueh W-C, Snitker S, Pollin TI, Sakul H, Jean PLS, et al. Eating behavior in the Old Order Amish: heritability analysis and a genome-wide linkage analysis. *Am J Clin Nutr*. 2002;75(6):1098–106.
42. Keski-Rahkonen A, Bulik CM, Pietiläinen KH, Rose RJ, Kaprio J, Rissanen A. Eating styles, overweight and obesity in young adult twins. *Eur J Clin Nutr*. 2007;61(7):822–9.
43. Hays NP, Bathalon GP, McCrory MA, Roubenoff R, Lipman R, Roberts SB. Eating behavior correlates of adult weight gain and obesity in healthy women aged 55–65 y. *Am J Clin Nutr*. 2002;75(3):476–83.
44. Provencher V, Drapeau V, Tremblay A, Després JP, Lemieux S. Eating behaviors and indexes of body composition in men and women from the Québec family study. *Obes Res*. 2003;11(6):783–92.
45. Koenders PG, Strien T van. Emotional eating, rather than lifestyle behavior, drives weight gain in a prospective study in 1562 employees. *J Occup Environ Med*. 2011;53(11):1287–93.
46. Gahagan S. The Development of Eating Behavior - Biology and Context. *J Dev Behav Pediatr*. 2012;33(3):261–71.
47. Lumeng JC, Hillman KH. Eating in larger groups increases food consumption. *Arch Dis Child*. 2007;92(5):384–7.
48. Rolls BJ, Rowe EA, Rolls ET, Kingston B, Megson A, Gunary R. Variety in a meal enhances food intake in man. *Physiol Behav*. 1981;26(2):215–21.
49. İnalkaç S, Arslantaş H. Duygusal yeme. *Arşiv Kaynak Tarama Derg*. 2018;27(1):70–82.
50. Kaplan HI, Kaplan HS. The psychosomatic concept of obesity. *J Nerv Ment Dis*. 1957;125(2):181–201.
51. Bruch H. *Eating Disorders: Obesity, Anorexia Nervosa and the Person Within*. New York: Basic Books; 1973.
52. Macht M, Simons G. Emotions and eating in every day life. *Appetite*. 2000;35:65–71.

53. Schachter S, Goldman R, Gordon A. Effects of fear, food deprivation, and obesity on eating. *J Pers Soc Psychol.* 1968;10(2):91–7.
54. Schachter S. Some extraordinary facts about obese humans and rats. *Am Psychol.* 1971;26(2):129–44.
55. Herman CP, Mack D. Restrained and unrestrained eating. *J Pers.* 1975;43(4):647–60.
56. Herman CP, Polivy J. Restrained eating. In: Stunkard AJ, editor. *Obesity.* Philadelphia: Saunders; 1980.
57. Macht M. How emotions affect eating: a five-way model. *Appetite.* 2008;50(1):1–11.
58. Volkow ND, Wang G-J, Maynard L, Jayne M, Fowler JS, Zhu W, et al. Brain dopamine is associated with eating behaviors in humans. *Int J Eat Disord.* 2003;33(2):136–42.
59. Heatherton TF, Baumeister RF. Binge eating as escape from self awareness. *Psychol Bull.* 1991;110:86–108.
60. Scherer KR, Wallbott HG, Summerfield AB. *Experiencing Emotion: A Crosscultural Study.* Cambridge: Cambridge University Press; 1986.
61. Lyman B. The nutritional values and food group characteristics of food preferred during various emotions. *J Psychol.* 1982;112(1st Half):121–7.
62. Patel KA, Schlundt DG. Impact of moods and social context on eating behavior. *Appetite.* 2001;36(2):111–8.
63. Alvarenga M dos S, Scagliusi FB, Philippi ST. Development and validity of the Disordered Eating Attitude Scale (DEAS). *Percept Mot Skills.* 2010;110(2):379–95.
64. Sojcher R, Fogerite SG, Perlman A. Evidence and potential mechanisms for mindfulness practices and energy psychology for obesity and binge-eating disorder. *Explore (NY).* 2012;8(5):271–6.
65. Erol A, Toprak G, Yazıcı F. Üniversite öğrencisi kadınlarda yeme bozukluğu ve genel psikolojik belirtileri yordayan etkenler. *Türk Psikiyatr Derg.* 2002;13(1):48–57.
66. Naguib R, Tawfik MMR, Alsubaiei SA, Almoallem AM, Alajlouni DM, Alruwaili TA, et al. Study of bodyweight and eating attitude among female university members in the Kingdom of Saudi Arabia: A comparison between different methods of weight assessment. *J Fam Med Prim Care.* 2020;9(4):2071–8.
67. Cordero ED, Israel T. Parents as protective factors in eating problems of college women. *Eat Disord.* 2009;17(2):146–61.
68. Erbay LG, Seçkin Y. Yeme bozuklukları. *Güncel Gastroenteroloji.* 2016;20(4):473–7.
69. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders.* 5th editio. Arlington: American Psychiatric Publishing; 2013.
70. Ağırman A, Maner F. Yeme Bozuklukları ve Duygusal İstismar: Olgu Sunumu. *Düşünen Adam Psikiyatr ve Nörolojik Bilim Derg.* 2010;23:121–7.
71. Biberdzic M, Tang J, Tan J. Beyond difficulties in self-regulation: the role of identity integration and personality functioning in young women with disordered eating behaviours. *J Eat Disord.* 2021;9(1):93.

72. Vogel EN, Singh S, Accurso EC. A systematic review of cognitive behavior therapy and dialectical behavior therapy for adolescent eating disorders. *J Eat Disord.* 2021;9(1):131.
73. Ünalın D, Öztop D, Elmalı F, Öztürk A, Konak D, Pırlak B, et al. Bir grup sađlık yüksekokulu öđrencisinin yeme tutumları ile sađlıklı yařam biçimi davranıřları arasındaki iliřki. *İnönü Üniversitesi Tıp Fakültesi Derg.* 2009;16(2):75–81.
74. Ulař B, Uncu F, Üner S. Sađlık Yüksekokulu Öđrencilerinde Olası Yeme Bozukluđu Sıklıđı ve Etkileyen Faktörler. *Ann Heal Sci Res.* 2013;2(2):1–8.
75. Altınel A. Kadınlarda yeme bozuklukları belirtilerinin algılanan ebeveynlik biçimi, duyuđu düzenleme güçlüğü, psikolojik iyi oluř ve yeme tutumları ile iliřkisi. (Basılmamıř Yüksek Lisans Tezi), Maltepe Üniversitesi, İstanbul 2018.
76. Dakanalis A, Pla-Sanjuanelo J, Caslini M, Volpato C, Riva G, Clerici M, et al. Predicting onset and maintenance of men's eating disorders. *Int J Clin Heal Psychol.* 2016;16(3):247–55.
77. Ergüney Okumuř FE. Tutumlar, inançlar ve üst biliřlerin yeme davranıřı üzerindeki yordayıcı etkileri. (Doktora Tezi), İstanbul Üniversitesi, İstanbul 2017.
78. Semiz M, Kavakçı Ö, Yađız A, Yontar G, Kuđu N. Sivas il merkezinde yeme bozukluklarının yaygınlıđı ve eřlik eden psikiyatrik tanılar. *Türk Psikiyatı Derg.* 2013;24(3):149–57.
79. Vardar E, Erzengin M. Ergenlerde Yeme Bozukluklarının Yaygınlıđı ve Psikiyatrik Eř Tanıları İki Ařamalı Toplum Merkezli Bir Çalıřma. *Türk Psikiyatı Derg.* 2011;22(4):205–12.
80. Deveci E. Üniversite öđrencilerinde yeme bozukluđunun görölme sıklıđı ve psikososyokültürel yordayıcıları: İstanbul örneklemi. (Doktora Tezi), İstanbul Üniversitesi, İstanbul 2020.
81. Rikani AA, Choudhry Z, Choudhry AM, Ikram H, Asghar MW, Kajal D, et al. A critique of the literature on etiology of eating disorders. *Ann Neurosci.* 2013;20(4):157–61.
82. Thornton LM, Mazzeo SE, Bulik CM. The Heritability of Eating Disorders: Methods and Current Findings. *Curr Top Behav Neurosci.* 2011;6:141–56.
83. Strumia R. Skin signs in anorexia nervosa. *Dermatoendocrinol.* 2009;1(5):268–70.
84. E C, T T. Disordered eating in college freshman women: a prospective study. *J Am Coll Heal.* 2001;49:229–35.
85. Turcotte D, Trocmé N, Dessureault D, Hélie S, Cloutier R, Montambeault E, et al. Étude Sur L'incidence Et Les Caractéristiques De La Maltraitance Signalée À La Direction De La Protection De La Jeunesse Au Québec. La Situation En 2003. 2007.
86. Ward A, Ramsay R, Turnbull S, Benedettini M, Treasure J. Attachment patterns in eating disorders: past in the present. *Int J Eat Disord.* 2000;28(4):370–6.
87. Sapmaz Yurtsever S, Tekinsav Sütcü S. Algılanan ebeveynlik biçimleri ile bozulmuř yeme tutumu arasındaki iliřkide erken dönem uyumsuz řemaların ve duyuđu düzenleme güçlüğü'nün aracı rolü. *Türk Psikol Derg.* 2017;32(80):20–43.
88. Çaka SY, Çınar N, Altınkaynak S. Adolesanda yeme bozuklukları. *Gümüşhane Üniversitesi Sađlık Bilim Derg.* 2018;7(1):203–9.

89. Uzunian LG, Vitalle MS. Social skills: a factor of protection against eating disorders in adolescents. *Cien Saude Colet*. 2015;20(11):3495–508.
90. Kaçar M, Hoccoğlu Ç. Pika, geri çıkarma bozukluğu nedir? Tanı ve tedavi yaklaşımları. *Klin Psikiyatr Derg*. 2019;22(3):347–54.
91. Grigsby R, Thyer B, Waller R, Johnston G. Chalk eating in middle Georgia: A culture-bound syndrome of pica? *South Med J*. 1999;92(2):190–2.
92. Stiegler LN. Understanding pica behavior: A review for clinical and education professionals. *Focus Autism Other Dev Disabl*. 2005;20(1):27–38.
93. Fawcett EJ, Fawcett JM, Mazmanian D. A meta-analysis of the worldwide prevalence of pica during pregnancy and the postpartum period. *Int J Gynaecol Obstet*. 2016;133(3):277–83.
94. American Psychiatric Association. Feeding and eating disorders: DSM-5® selections. American Psychiatric Publishing; 2015.
95. Chahuan J, Rey P, Monrroy H. Rumination syndrome. A review article. *Rev Gastroenterol Mex*. 2021;86(2):163–71.
96. Karadere ME, Hoccoğlu Ç. Kaçınan/kısıtlı yiyecek alımı bozukluğu nedir? Tanı ve tedavi yaklaşımları. *Gümüşhane Üniversitesi Sağlık Bilim Derg*. 2018;7(4):110–8.
97. Kurz S, Dyck Z van, Dremmel D, Munsch S, Hilbert A. Early-onset restrictive eating disturbances in primary school boys and girls. *Eur Child Adolesc Psychiatry*. 2015;24(7):779–85.
98. Yücel B. Estetik Bir Kaygıdan Hastalığa Uzanan Yol: Yeme Bozuklukları. *Klin Gelişim Derg*. 2009;4:39–44.
99. Baktıroğlu G. Yeme bozukluğu değerlendirme ölçeğinin yetişkinler üzerinde geçerlik, güvenirlik ve norm çalışması. (Doktora Tezi), İstanbul Üniversitesi, İstanbul 2019.
100. Mehler PS, Brown C. Anorexia nervosa - medical complications. *J Eat Disord*. 2015;3(11):1–8.
101. Herpertz-Dahlmann B. Adolescent eating disorders: definitions, symptomatology, epidemiology and comorbidity. *Child Adolesc Psychiatr Clin N Am*. 2009;18(1):31–47.
102. Fairburn CG, Harrison P. Eating disorders. *Lancet (London, England)*. 2003;361(9355):407–16.
103. Lasater LM, Mehler PS. Medical complications of bulimia nervosa. *Eat Behav*. 2001;2(3):279–92.
104. Turan Ş, Poyraz CA, Özdemir A. Tıkınırcasına Yeme Bozukluğu. *Psikiyatr Güncel Yaklaşımlar*. 2015;7(4):419–35.
105. Güven N, Özlü T, Kenger E, Tümer H, Ergün C. Anoreksiya nervoza ve tıkınırcasına yeme bozukluğunu bir yıl ara ile yaşamak; olgu sunumu. *Süleyman Demirel Üniversitesi Sağlık Bilim Derg*. 2020;11(2):279–81.
106. Mehler PS, Birmingham C, Crow S, Jahraus J. Medical Complications of Eating Disorders. *Psychiatr Ann*. 2010;48(10):66–80.

107. Ryan-Harshman M, Aldoori W. New dietary reference intakes for macronutrients and fibre. *Can Fam Physician*. 2006;52(2):177–9.
108. Ferretti F, Mariani M. Simple vs. Complex Carbohydrate Dietary Patterns and the Global Overweight and Obesity Pandemic. *Int J Env Res Public Heal*. 2017;14(10):1174.
109. Dülger D, Gahan Y. Diyet lifin özellikleri ve sağlık üzerindeki etkileri. *Uludağ Üniversitesi Ziraat Fakültesi Derg*. 2011;25(2):147–58.
110. Russell WR, Baka A, Björck I, Delzenne N, Gao D, Griffiths HR, et al. Impact of Diet Composition on Blood Glucose Regulation. *Crit Rev Food Sci Nutr*. 2016;56(4):541–90.
111. Kabisch S, Meyer NMT, Honsek C, Gerbracht C, Dambeck U, Kemper M, et al. Obesity Does Not Modulate the Glycometabolic Benefit of Insoluble Cereal Fibre in Subjects with Prediabetes—A Stratified Post Hoc Analysis of the Optimal Fibre Trial (OptiFiT). *Nutrients*. 2019;11(11):2726.
112. Threapleton DE, Greenwood DC, Evans CEL, Cleghorn CL, Nykjaer C, Woodhead C, et al. Dietary fibre intake and risk of cardiovascular disease: systematic review and meta-analysis. *BMJ*. 2013;347:f6879.
113. Woo H-I, Kwak SH, Lee Y, Choi JH, Cho YM, Om A-S. A Controlled, Randomized, Double-blind Trial to Evaluate the Effect of Vegetables and Whole Grain Powder That Is Rich in Dietary Fibers on Bowel Functions and Defecation in Constipated Young Adults. *J Cancer Prev*. 2015;20(1):64–9.
114. Rao SSC, Yu S, Fedewa A. Systematic review: dietary fibre and FODMAP-restricted diet in the management of constipation and irritable bowel syndrome. *Aliment Pharmacol Ther*. 2015;41(12):1256–70.
115. Barber T, Kabisch S, Pfeiffer A, Weickert M. The Health Benefits of Dietary Fibre. *Nutrients*. 2020;12(10):3209.
116. European Commission. Health Promotion and Disease Prevention Knowledge Gateway, Dietary Fibre [Internet]. 2023 [cited 2023 Nov 25]. Available from: https://knowledge4policy.ec.europa.eu/health-promotion-knowledge-gateway/dietary-fibre_en.
117. Lonnie M, Hooker E, Brunstrom JM, Corfe BM, Green MA, Watson AW, et al. Protein for Life: Review of Optimal Protein Intake, Sustainable Dietary Sources and the Effect on Appetite in Ageing Adults. *Nutrients*. 2018;10(3):360.
118. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü. Türkiye Beslenme Rehberi (TÜBER). TC Sağlık Bakanlığı Yayın 1031; 2022.
119. Spector A, Kim H. Discovery of essential fatty acids. *J Lipid Res*. 2015;56(1):11–21.
120. Ünsal A. Beslenmenin Önemi ve Temel Besin Öğeleri. *Kırşehir Ahi Evran Üniversitesi Sağlık Bilim Derg*. 2019;2(3):1–10.
121. Kumar A, P N, Kumar M, Jose A, Tomer V, Oz E, et al. Major Phytochemicals: Recent Advances in Health Benefits and Extraction Method. *Molecules*. 2023;28(2):887.
122. Fasola O, Abosede O, Fasola FA. Knowledge, attitude and practice of good nutrition among women of childbearing age in Somolu Local Government, Lagos State. *J Public Health Africa*. 2018;9(1):793.

123. Qiu Y, Ding C, Zhang Y, Yuan F, Gong W, Zhou Y, et al. The Nutrition Knowledge Level and Influencing Factors among Chinese Women Aged 18-49 Years in 2021: Data from a Nationally Representative Survey. *Nutrients*. 2023;15(9):2034.
124. Gracey D, Stanley N, Giles-Corti B, Beilin L, Burke V. Nutritional knowledge, beliefs and behaviours in teenage school students. *Health Educ Res*. 1996;11(2):187–204.
125. Heerman WJ, Jackson N, Hargreaves M, Mulvaney SA, Schlundt D, Wallston KA, et al. Clusters of Healthy and Unhealthy Eating Behaviors Are Associated With Body Mass Index Among Adults. *J Nutr Educ Behav*. 2017;49(5):415–21.
126. Spronk I, Kullen C, Burdon C, O'Connor H. Relationship between nutrition knowledge and dietary intake. *Br J Nutr*. 2014;111(10):1713–26.
127. Scalvedi M, Gennaro L, Saba A, Rossi L. Relationship Between Nutrition Knowledge and Dietary Intake: An Assessment Among a Sample of Italian Adults. *Front Nutr*. 2021;8(714493).
128. Bonaccio M, Castelnovo A Di, Costanzo S, Lucia F De, Olivieri M, Donati MB, et al. Nutrition knowledge is associated with higher adherence to Mediterranean diet and lower prevalence of obesity. Results from the Moli-sani study. *Appetite*. 2013;68:139–46.
129. Wardle J, Parmenter K, Waller J. Nutrition knowledge and food intake. *Appetite*. 2000;34(3):269–75.
130. Pelchat ML, Schaefer S. Dietary monotony and food cravings in young and elderly adults. *Physiol Behav*. 2000;68(3):353–9.
131. Oliveira J. The body asks and the mind judges: the episode of food craving, its triggers and nutritional treatment. *Einstein (Sao Paulo)*. 2022;20:eMD6705.
132. Meule A. Twenty Years of the Food Cravings Questionnaires: a Comprehensive Review. *Curr Addict Reports*. 2020;7(21):30–43.
133. Hill AJ. The psychology of food craving. *Proc Nutr Soc*. 2007;66(2):277–85.
134. Rodríguez-Martín BC, Meule A. Food craving: new contributions on its assessment, moderators, and consequences. *Front Psychol*. 2015;6(21).
135. Reents J, Seidel AK, Wiesner CD, Pedersen A. The Effect of Hunger and Satiety on Mood-Related Food Craving. *Front Psychol*. 2020;11:568908.
136. Hill A, Weaver C, Blundell J. Food craving, dietary restraint, and mood. *Appetite*. 1991;17(30):187–97.
137. Gilhooly CH, Das SK, Golden JK, McCrory MA, Dallal GE, Saltzman E, et al. Food cravings and energy regulation: The characteristics of craved foods and their relationship with eating behaviors and weight change during 6 months of dietary energy restriction. *Int J Obes*. 2005;31(12):1849–58.
138. Cushing CC, Benoit SC, Peugh JL, Reiter-Purtill J, Inge TH, Zeller MH. Longitudinal trends in hedonic hunger after Roux-en-Y gastric bypass in adolescents. *Surg Obes Relat Dis*. 2014;10(1):125–30.
139. Demos KE, Heatherton TF, Kelley WM. Individual differences in nucleus accumbens activity to food and sexual images predict weight gain and sexual behavior. *J Neurosci*. 2012;32(16):5549–52.

140. Greeno CG, Wing RR, Shiffman S. Binge antecedents in obese women with and without binge eating disorder. *J Consult Clin Psychol.* 2000;68(1):95–102.
141. Jansen A. A learning model of binge eating: cue reactivity and cue exposure. *Behav Res Ther.* 1998;36(3):257–72.
142. Imperatori C, Innamorati M, Tamburello S, Continisio M, Contardi A, Tamburello A, et al. Gender differences in food craving among overweight and obese patients attending low energy diet therapy: a matched case-control study. *Eat Weight Disord.* 2013;18(3):297–303.
143. Chao AM, Grilo CM, Sinha R. Food cravings, binge eating, and eating disorder psychopathology: Exploring the moderating roles of gender and race. *Eat Behav.* 2016;21:41–7.
144. Hormes JM, Timko CA. All cravings are not created equal. Correlates of menstrual versus non-cyclic chocolate craving. *Appetite.* 2011;57(1):1–5.
145. Zellner DA, Garriga-Trillo A, Centeno S, Wadsworth E. Chocolate craving and the menstrual cycle. *Appetite.* 2004;42(1):119–21.
146. Parmenter K, Waller J, Wardle J. Demographic variation in nutrition knowledge in England. *Health Educ Res.* 2000;15(2):163–74.
147. Zellner DA, Garriga-Trillo A, Rohm E, Centeno S, Parker S. Food liking and craving: A cross-cultural approach. *Appetite.* 1999;33(1):61–70.
148. Pelchat ML. Food cravings in young and elderly adults. *Appetite.* 1997;28(2):103–13.
149. Cepeda-Benito A, Fernandez M, Moreno S. Relationship of gender and eating disorder symptoms to reported cravings for food: Construct validation of State and Trait Craving Questionnaires in Spanish. *Appetite.* 2003;40(1):47–54.
150. Racette SB, Deusinger SS, Strube MJ, Highstein GR, Deusinger RH. Weight changes, exercise, and dietary patterns during freshman and sophomore years of college. *J Am Coll Heal.* 2005;53(6):245–51.
151. Yu Z, Tan M. Disordered eating behaviors and food addiction among nutrition major college students. *Nutrients.* 2016;8(11):1–16.
152. Hoek HW. Incidence, prevalence and mortality of anorexia nervosa and other eating disorders. *Curr Opin Psychiatry.* 2006;19(4):389–94.
153. Wang L, Wang H, Zhang B, Popkin BM, Du S. Elevated Fat Intake Increases Body Weight and the Risk of Overweight and Obesity among Chinese Adults: 1991-2015 Trends. *Nutrients.* 2020;12(11):3272.
154. Kazkonda İ. Üniversite Öğrencilerinde Ortoreksiya Nervosa (Sağlıklı Beslenme Takıntısı) Belirtilerinin İncelenmesi. (Yüksek Lisans Tezi), Gazi Üniversitesi, Ankara 2010.
155. Jáuregui Lobera I, Bolaños P, Carbonero R, Valero Blanco E. Psychometric properties of the Spanish version of Food Craving Inventory (FCI-SP). *Nutr Hosp.* 2010;25(6):984–92.
156. Nicholls W, Hulbert-Williams L. British English translation of the Food Craving Inventory (FCI-UK). *Appetite.* 2013;67:37–43.

157. Tarragon E, Stein J, Meyer J. Psychometric Properties of the German Translated Version and Adaptation of the Food Craving Inventory. *Front Psychol.* 2017;8:736.
158. Queiroz de Medeiros AC, Pedrosa LFC, Yamamoto ME. Food cravings among Brazilian population. *Appetite.* 2017;108:212–8.
159. Aliasghari F, Jafarabadi MA, Yaghin NL, Mahdavi R. The food craving inventory in an Iranian population: post-hoc validation and individual differences. *Eat Weight Disord.* 2021;26(5):1529–39.
160. Özel İÇ, Yabancı Ayhan N, Çetiner Ö. Adaptation of Food Craving Inventory to Turkish culture: a validity and reliability study. *J Eat Disord.* 2022;10(1):144.
161. Garner D, Garfinkel P. The Eating Attitudes Test: an index of the symptoms of anorexia nervosa. *Psychol Med.* 1979;9(2):273–9.
162. Garner D, Olmsted M, Bohr Y, Garfinkel P. The Eating Attitudes Test: psychometric features and clinical correlates. *Psychol Med.* 1982;12(4):871–8.
163. Ergüney Okumuş F, Sertel Berk H. Yeme Tutum Testi Kısa Formunun (EAT-26) Üniversite Örnekleminde Türkçeye Uyarlanması ve Psikometrik Özelliklerinin Değerlendirilmesi. *Psikol Çalışmaları.* 2020;57–78.
164. Liu X, Ren X, Li Z, Lin Y, Pan C, Li T, et al. Disordered Eating Attitudes Among University Students: The Role of Psychological Distress. *Altern Ther Health Med.* 2021;27(5):58–60.
165. Abuawad B, Ellala Z, El-saleh D-M, Alsalhi N, Qatawneh S, Aljarrah K. Student Eating Attitude and Life Style Impact on the Academic Performance: Evidence from the College Students. *Eurasian J Educ Res.* 2023;103:18–32.
166. Celik S, Ugur BA, Aykurt FA, Bektas M. Eating Attitudes and Related Factors in Turkish Nursing Students. *Nurs midwifery Stud.* 2015;4(2):e25479.
167. Almasi N, Rakıcıoğlu N. Assessing the Level of Nutrition Knowledge and Its Association with Dietary Intake in University Students. *Balıkesir Sağlık Bilim Derg.* 2021;10(3):274–80.
168. Franken IH, Muris P. Individual differences in reward sensitivity are related to food craving and relative body weight in healthy women. *Appetite.* 2005;45(2):198–201.
169. Chao A, Grilo CM, White MA, Sinha R. Food cravings, food intake, and weight status in a community-based sample. *Eat Behav.* 2014;15(3):478–82.
170. Çelebi İ, Koçak H, Çalışkan C. The Relationship Between Disordered Eating Attitudes, Nutritional Knowledge Levels, and Overweight and Obesity Among University Students: A Single-Center Study in Türkiye. *Online Turkish J Heal Sci.* 2023;8(4):418–24.
171. Piko BF, Kiss H, Gráczér A, Fitzpatrick KM. Risk of disordered eating in emerging adulthood: media, body and weight-related correlates among Hungarian female university students. *J Prev Med Hyg.* 2022;63(1):E83–E89.
172. Akdevelioğlu Y, Yörüsün TÖ. Üniversite Öğrencilerinin Yeme Tutum ve Davranışlarına İlişkin Bazı Faktörlerin İncelenmesi. *Gazi Sağlık Bilim Derg.* 2019;4(1):19–28.
173. Pepino MY, Finkbeiner S, Mennella JA. Similarities in food cravings and mood states

- between obese women and women who smoke tobacco. *Obesity (Silver Spring)*. 2009;17(6):1158–63.
174. Pepino MY, Mennella JA. Cigarette smoking and obesity are associated with decreased fat perception in women. *Obesity (Silver Spring)*. 2014;22(4):1050–5.
175. Chao AM, White MA, Grilo CM, Sinha R. Examining the effects of cigarette smoking on food cravings and intake, depressive symptoms, and stress. *Eat Behav*. 2017;24:61–5.
176. Oliveira J, Cordás T. The body asks and the mind judges: food cravings in eating disorders. *Encephale*. 2020;46(4):269–82.
177. Şanlıer N, Konaklıođlu E, Güçer E. Gençlerin Beslenme Bilgi, Alışkanlık ve Davranışları İle Beden Kütle İndeksleri Arasındaki İlişki. *Gazi Eğitim Fakültesi Derg*. 2009;29(2):333–52.
178. Kristal AR, Shattuck AL, Henry HJ. Patterns of dietary behavior associated with selecting diets low in fat: reliability and validity of a behavioral approach to dietary assessment. *J Am Diet Assoc*. 1990;90(2):214–20.
179. Sharma S V, Gernand AD, Day RS. Nutrition knowledge predicts eating behavior of all food groups except fruits and vegetables among adults in the Paso del Norte region: Qué Sabrosa Vida. *J Nutr Educ Behav*. 2008;40(6):361–8.

8. APPENDIXES

8.1. Appendix 1 (Informed Consent Form)

BİLGİLENDİRİLMİŞ GÖNÜLLÜ OLUR FORMU ÖRNEĞİ (BGOF)

ÇALIŞMANIN ADI: Öğrencilerde Yeme İsteğinin Beden Kütle İndeksi, Yeme Tutumu ve Beslenme Bilgi Düzeyi ile İlişkisi: Bir vakıf üniversitesi örnekleme

Aşağıda bilgileri yer almakta olan bir araştırma çalışmasına katılmanız istenmektedir. Çalışmaya katılıp katılmama kararı tamamen size aittir. Katılmak isteyip istemediğinize karar vermeden önce araştırmanın neden yapıldığını, bilgilerinizin nasıl kullanılacağını, çalışmanın neleri içerdiğini, olası yararları ve risklerini ya da rahatsızlık verebilecek yönlerini anlamamız önemlidir. Lütfen aşağıdaki bilgileri dikkatlice okumak için zaman ayırınız. Eğer çalışmaya katılma kararı verirseniz, Çalışmaya Katılma Onayı Formu'nu imzalayınız. Çalışmadan herhangi bir zamanda ayrılmakta özgürsünüz. Çalışmaya katıldığınız için size herhangi bir ödeme yapılmayacak ya da sizden herhangi bir maddi katkı/malzeme katkısı istenmeyecektir. Bu araştırmanın amacı, 1) BKİ ile Türklere özgü besinler için yeme isteği sıklığı arasındaki ilişkileri belirlemek, 2) yeme tutumu ile yeme isteği sıklığı arasındaki ilişkiyi incelemek ve 3) bireylerin temel beslenme ve besin tercihleriyle ilgili beslenme bilgi düzeylerinin yeme isteği sıklığı ile ilgisini değerlendirmektir.

Çalışmaya 375 lisans öğrencisi alınması planlanmaktadır. Beslenme ve Diyetetik Lisans Programı öğrencileri çalışmaya alınmayacaktır. Çalışma tek merkezlidir. Yeditepe Üniversitesinde yapılacaktır.

Çalışmaya katılmakla parasal yük altına girmeyeceksiniz ve size de herhangi bir ödeme yapılmayacaktır.

Bu çalışmada yer alıp almamak tamamen size bağlıdır. Şu anda bu formu imzalarsanız bile istediğiniz herhangi bir zamanda bir neden göstermeksizin çalışmayı bırakmakta özgürsünüz. Araştırmacı kişisel bilgilerinizi, araştırmayı ve istatistiksel analizleri yürütmek için kullanacaktır ancak kimlik bilgileriniz gizli tutulacaktır. Yalnızca gereği halinde, sizinle ilgili bilgileri etik kurullar ya da resmi makamlar inceleyebilir. Çalışmanın sonunda, kendi sonuçlarınızla ilgili bilgi istemeye hakkınız vardır. Çalışma sonuçları çalışma bitiminde tıbbi literatürde yayınlanabilecektir ancak kimliğiniz açıklanmayacaktır.

Sorumlu Araştırmacı: Dr. Öğr. Üyesi İrem KAYA CEBİOĞLU

Araştırma Yürütücüsü: Dyt. Senem YUMUŞAK

Yukarıdaki bilgileri ilgili araştırmacı ile ayrıntılı olarak tartıştım ve kendisi bütün sorularımı cevapladı. Bu bilgilendirilmiş olur belgesini okudum ve anladım.

Bu araştırmaya katılmayı kabul ediyor ve bu onay belgesini kendi hür irademle imzalıyorum.

Bu onay, ilgili hiçbir kanun ve yönetmeliği geçersiz kılmaz.

GÖNÜLLÜ	Ad-Soyad:	İmza:	Tarih:
ARAŞTIRMACI	Ad-Soyad:	İmza:	
TANIK	Ad-Soyad:	İmza:	

8.2. Appendix 2 (Scales)

1) DEMOGRAFİK VERİLER

VERİ TOPLAMA FORMU

Fakülte/Bölüm: Yaş: Cinsiyet: K E

Şu anki kilonuz (kg): Boy (m): BKİ (kg/m²): İdeal kilonuz:

Yetişkinlikteki en yüksek kilonuz: Yetişkinlikteki en düşük kilonuz:

Su an yaşadığınız yer: 1. Öğrenci Evinde Yalnız 2. Öğrenci Evinde Arkadaş ile
3. Aile/Akraba ile 4. Öğrenci Yurdu

Sigara Kullanım Durumunuz: 1. Hiç içmedim 2. İçiyordum, bıraktım 3.İçiyorum.

Günde kaç öğün yapıyorsunuz?

Yaptığınız öğünleri işaretleyiniz. 1. Kahvaltı 2. Kuşluk 3. Öğle 4. İkinci
5. Akşam 6. Gece

Günde kaç litre su içiyorsunuz?

Gün içindeki çay, kahve ve diğer içecekler için tüketim miktarınızı belirtiniz.

Çay: adet çay bardağı/ adet çay fincanı/ adet kupa

Kahve: adet kupa

Diğer: içecekten; adet/ölçü

2) FCI-TR (YEME İSTEĞİ ENVANTERİ)

“Yeme isteği, belirli bir besini tüketmeye yönelik yoğun ve direnmesi zor bir istek olarak tanımlanır.”

Talimatlar: Aşağıda listelenen besinlerin her biri için lütfen size uygun seçeneği işaretleyin.

Son 1 ay içinde, aşağıdaki besinler için ne sıklıkla yeme isteği duyduunuz?

	Hiçbir zaman	Nadiren	Bazen	Sık sık	Her zaman/ Neredeyse her gün
Pizza	1	2	3	4	5
Hamburger	1	2	3	4	5
Patates kızartması	1	2	3	4	5
Soslu dürüm/Döner	1	2	3	4	5
Lahmacun	1	2	3	4	5
Çiğ köfte	1	2	3	4	5
Cips	1	2	3	4	5
Kaymak	1	2	3	4	5
Tereyağı	1	2	3	4	5
Çekirdek	1	2	3	4	5
Çikolata	1	2	3	4	5
Kek	1	2	3	4	5
Kurabiye	1	2	3	4	5
Dondurma	1	2	3	4	5
Sürülebilir çikolata	1	2	3	4	5
Şerbetli tatlılar (Baklava vb.)	1	2	3	4	5
Şekerli içecekler	1	2	3	4	5
Reçel – bal	1	2	3	4	5
Ekmek	1	2	3	4	5
Pilav	1	2	3	4	5
Patates püresi	1	2	3	4	5
Makarna	1	2	3	4	5
Simit – poğaç	1	2	3	4	5
Kızarmış tavuk	1	2	3	4	5
Kebap	1	2	3	4	5
Kızarmış balık	1	2	3	4	5
Kokoreç	1	2	3	4	5

3) EAT-26 (YEME TUTUM TESTİ)

Açıklama: Bu ölçek, profesyonel dikkat gerektiren bir yeme bozukluğunuz olup olmadığını belirlemede size yardımcı olan bir tarama ölçeğidir. Aşağıda yer alan formu doğru, dürüstçe ve mümkün olduğunca eksiksiz doldurunuz. Soruların doğru ya da yanlış cevabı yoktur.

Aşağıda yer alan her bir ifade için size uygun gelen bir şıkki işaretleyiniz.	Daima	Çok sık	Sık sık	Bazen	Nadiren	Hiçbir zaman
1. Şişmanlamaktan ödüm kopar.						
2. Acıktığımda yemek yememeye çalışırım.						
3. Kendimi sürekli yemek düşünürken bulurum.						
4. Yemek yemeyi durduramadığımı hissettiğim zamanlar olur.						
5. Yiyeceğimi küçük parçalara bölerim.						
6. Yediğim yiyeceklerin kalorisini bilirim.						
7. Ekmek, patates, pirinç gibi yüksek kalorili yiyeceklerden kaçınırım.						
8. Başkaları, benim daha fazla yememi tercih ediyorlar gibi gelir.						
9. Yemek yedikten sonra kusarım.						
10. Yemek yedikten sonra aşırı suçluluk duyarım.						
11. Zayıf olma arzusu zihnimi meşgul eder.						
12. Egzersiz yaptığımda, harcadığım kalorileri düşünürüm.						
13. Başkaları çok zayıf olduğumu düşünür.						
14. Vücudumda yağ birikeceği (şişmanlayacağım) düşüncesi zihnimi meşgul eder.						
15. Yemeklerimi yemek, başkalarınınkinden daha uzun sürer.						
16. Şekerli yiyeceklerden kaçınırım.						
17. Diyet (perhiz) yemekleri yerim.						
18. Yaşamımı yiyeceğin kontrol ettiğini düşünürüm.						
19. Yiyecek konusunda kendimi denetleyebilirim.						
20. Yemek yeme konusunda başkalarının bana baskı yaptığını hissederim.						
21. Yiyeceklerle ilgili düşünceler çok fazla zamanımı alır.						
22. Tatlı yedikten sonra rahatsız hissederim.						
23. Diyet yaparım.						
24. Midemin boş olmasından hoşlanırım.						
25. Yemeklerden sonra içimden kusmak gelir.						
26. Şekerli, yağlı yiyecekleri denemekten hoşlanırım.						
Geçtiğimiz 6 ayda;	Hiçbir zaman	Ayda 1 ya da daha az	Ayda 2-3 kez	Haftada 1 kez	Haftada 2-6 kez	Günde 1 ya da daha çok kez
A Durduramayacağınızı hissettiğiniz tıknırcasına yeme ataklarınız oldu mu?*						
B Kilonuzu ve beden şeklinizi kontrol etmek için kendinizi kusturdunuz mu?						
C Kilonuzu ve beden şeklinizi kontrol etmek için laksatif (barsak söktürücü), diyet hapları veya idrar söktürücü kullandınız mı?						
D Kilo vermek ya da kilonuzu kontrol etmek için bir günde 60 dakikadan fazla egzersiz yaptınız mı?						
E Geçtiğimiz 6 ayda 9 kilodan fazla verdiniz mi?						

*Tıknırcasına yeme atakları: aynı şartlarda pek çok kişinin yiyebildiğinden çok daha fazla yemek ve yeme kontrolünü kaybettiğiniz hissi olarak tanımlanmaktadır.

4) YETİŞKİNLER İÇİN BESLENME BİLGİ DÜZEYİ (YETBİD) ÖLÇEĞİ

TEMEL BESLENME VE BESİN-SAĞLIK BİLGİSİ

		Kesinlikle katılıyorum	Katılıyorum	Ne katılıyorum ne katılmıyorum	Katılmıyorum	Kesinlikle katılmıyorum
1	Doğal, taze sıkılmış meyve suları şeker içermez.					
2	Havuç iyi bir A vitamini kaynağıdır.					
3	Vitamin ve mineraller enerji verir.					
4	Karbonhidratlar temel enerji kaynağıdır.					
5	Dondurulmuş ürünlerin besin değeri taze besinlerden daha düşüktür.					
6	Meyvelerin protein içeriği yüksektir.					
7	Yumurta ile kırmızı et, içerdikleri protein miktarı açısından benzerdir.					
8	Zeytinyağı tüketmek kolesterolü yükseltir.					
9	Kuru fasulye piyazının lif içeriği yüksektir.					
10	Salam ve sosis gibi işlenmiş et ürünlerinin içerisinde bulunan yağlar sağlık için zararlıdır.					
11	Süt ve süt ürünlerinde bulunan kalsiyum minerali kemik ve diş sağlığı için önemlidir.					
12	Kemik erimesinden korunmada gerekli olan D vitamini en iyi kaynağı güneştir.					
13	E vitamini görme duyusu için oldukça etkili bir vitamindir.					
14	Portakalda bulunan C vitamini bağışıklığı güçlendirerek soğuk algınlığı ve gribal enfeksiyonlara karşı korur.					
15	İçerdiği vitaminlerden dolayı tam tahıllı(esmer) ekme tüketmek sinir sistemi için faydalıdır.					
16	Tuzun fazla tüketilmesi tansiyonu etkilemez.					
17	Kırmızı et B12 vitamini içerdiği için unutkanlığı önlemede etkilidir.					
18	Kırmızı ve mor renkli sebze ve meyveler kanserden koruyucudur.					
19	Balığın doymuş yağ içeriği kırmızı etten daha yüksektir.					
20	Yağlar, protein ve karbonhidratlara göre daha az enerji içerirler.					

***Beslenme ve sağlık arasındaki ilişkinin derecesi nasıldır? Değerlendiriniz.

0	1	2	3	4	5	6	7	8	9	10
←hiç ilişki olmaması					yüksek ilişkili olması→					

BESİN TERCİHİ

		Kesinlikle katılıyorum	Katılıyorum	Ne katılıyorum ne katılmıyorum	Katılmıyorum	Kesinlikle katılmıyorum
1	Şeker hastalarının meyve suyu yerine meyvenin kendisini (mümkünse kabuğunu soymadan) tüketmeleri daha sağlıklıdır.					
2	Şekerli besinler yerine lifli besinler tüketmek kabızlığı önler.					
3	Gıdalarla aldığı yağ miktarını azaltmak isteyen bir birey tavuk kızartma yerine tavuk ızgara tercih etmelidir.					
4	Bir öğündeki aldığı proteini artırmak isteyen kişi, bulgurlu ıspanak yemeği yerine yumurtalı ıspanak yemeğini tercih etmelidir.					
5	Ara öğünde tatlı bisküvi yerine kepekli galeta tüketmek daha doğru bir seçimdir.					
6	Çocukların beslenme çantasına gofret yerine 3-4 adet kuru kayısı koymak daha faydalıdır.					
7	Bir yetişkinin sıvı ihtiyacını çay ve kahve gibi içecekler yerine su tüketerek karşılaması daha doğrudur.					
8	Vitamin ve mineralleri doğrudan besinlerden almak yerin, ilaç şeklindeki vitaminlerden almak daha faydalıdır.					
9	Hayvansal kaynaklı besinlerin(et, balık, süt, yumurta gibi) içerisindeki proteinler, vücut sağlığı için çok önemlidir.					
10	Beyaz ekmeğe, tam tahıllı(esmer) ekmeğe göre daha sağlıklıdır.					
11	Alınan tuzu azaltmak için lahana turşusu yerine lahana salatası tercih edilmelidir.					
12	Gıdalardan aldığı yağ miktarını azaltmak isteyen birisi light süt tercih edebilir.					

***Günlük hayatınızda uyguladığınız besin tercihlerinizi ne kadar doğru buluyorsunuz?
Değerlendiriniz.

0	1	2	3	4	5	6	7	8	9	10
←Yetersiz, az derecede.									Çok iyi derecede yeterli→	

8.3. Appendix 3 (Permits About Thesis)

2202303-1105.pdf

İndir Mail Gönder Notlar Akış Tarihiçesi EYP Paketini İndir

Paylaş Aç İşlemler

SDP/302 - Öğrenci Özlük İşleri/14 - Tez İşleri/01 - Konu Belirleme, Değişirme ve Onama/2202303-1105.pdf Versiyon : 1

1 of 1 100%

T.C.
YEDİTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜ
Sağlık Bilimleri Enstitüsü Müdürlüğü

10.03.2023

Sayı : E.18897253-302.14.01-1515
Konu : Senem Yumuşak'ın Tez İzni

YEDİTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜNE

Sağlık Bilimleri Enstitüsü Beslenme ve Diyetetik Anabilim Dalı 20213036002 No'lu Yüksek Lisans öğrencisi **Senem YUMUŞAK**'ın, Dr.Öğr.Üyesi İrem KAYA CEBİOĞLU danışmanlığında yürüteceği, "**Öğrencilerde Yeme İsteginin Beden Kütle İndeksi, Yeme Tutumu ve Beslenme Bilgi Düzeyi ile İlişkisi: Bir Vakıf Üniversitesi Örneklemi**" isimli araştırmanın Etik onayı ekte olup Yeditepe Üniversitesi öğrencileri ile gönüllük esasına uygun olarak gerçekleştirilmesi ve değerlendirilmesi için gerekli izinlerin verilmesi hususunda gereğini bilgilerinize saygılarımla arz ederim.

Prof. Dr. Bayram YILMAZ
Müdür

8.4. Appendix 4 (Ethics Committee Approval Certificate)



T.C.
YEDİTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜ
Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu

Sayı : E.83321821-805.02.03-124
Konu : Etik Kurul Karar Yazısı

Sayın Dr. Öğr. Üyesi İrem Kaya Cebioğlu

Yeditepe Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kuruluna etik onay için başvuru yapılmış olan araştırma önerisinin başlığı, araştırmacılar, başvuru numarası, sunulan belgeler ve toplantı bilgileri aşağıda yer almaktadır. İlgili araştırma önerisi, etik kurulumuz üyeleri tarafından değerlendirilmiş olup, etik ve bilimsel açıdan **UYGUN** olduğuna karar verilmiştir.

Araştırma Başlığı:	Öğrencilerde Yeme İsteğinin Beden Kütle İndeksi, Yeme Tutumu ve Beslenme Bilgi Düzeyi ile İlişkisi: Bir Vakıf Üniversitesi Örnekleme
Araştırmacılar:	Senem Yumuşak, Dr. Öğr. Üyesi İrem Kaya Cebioğlu
Başvuru Numarası:	202301Y0338

TOPLANTI BİLGİLERİ

Toplantı Tarihi:	13.01.2023	Toplantı Yeri:	Çevirim içi (Google Meet)
-------------------------	------------	-----------------------	---------------------------

SUNULAN BELGELER

Islak imzalı başvuru dosyası, CD veya USB belleğe kaydedilmiş başvuru dosyası ve elektronik başvuru
Araştırma başlığı ve araştırmacıların isimleri
Başvuru dilekçesi
Başvuru formu
Araştırmanın;
• Niteliği
• Önemi ve özgün değeri
• Amaç ve hedefleri
• Yöntemi
• Yönetimi
• Yaygın etkisi
• Araştırma bütçesi (Mevcutsa)
• Süresi ve uygunluğu (Zaman cetveli)
• Kaynakları

Bu belge, güvenli elektronik imza ile imzalanmıştır.

Belge Doğrulama Adresi : <http://belgedogrulama.yeditepe.edu.tr/bg.aspx?id=87CC07D8-67E4-4E94-ADAF-04338290D284>

Yeditepe Üniversitesi 26 Ağustos Yerleşimi, İnönü Mahallesi Kayışdağı
Caddesi 34755
Ataşehir / İSTANBUL
Telefon No: (0216) 578 00 00 Faks No : (0216) 578 02 99
İnternet Adresi www.yeditepe.edu.tr
Kep Adresi : yeditepeuniversitesi@hs03.kep.tr

Bilgi İçin: Sevgi BAYRAKTAR
Unvan: Uzman Yardımcısı
Telefon No:



Bilgilendirilmiş Gönüllü Olur Formu (yapılan arařtırmaya özel olarak hazırlanmıř)
Taahhütname-1 Arařtırmanın yapılacađı kurumdan izin alma sorumluluđunun arařtırmacılara ait olduđuna dair taahhüt
Taahhütname-2 Dünya Tıp Birliđi Helsinki Bildirgesinin son versiyonunun ve Sađlık Bakanlıđı'nın ilgili tüm kılavuzlarının okunmasına dair taahhüt
Taahhütname-3 Daha önce yapılmıř etik kurul bařvuruları mevcut olup olmadıđına dair taahhüt
Taahhütname-4 Arařtırma sırasında arařtırma bütçesinde yer almayan ve gönüllünün kendisine veya Sosyal Güvenlik Kurumuna ek yük getirecek hiřbir iřlem uygulanmayacađına dair taahhüt
Taahhütname-5 COVID-19 hastalarında tedavi yaklařımları ve bilimsel arařtırmalar genelgesi okunmasına dair taahhüt
Taahhütname-6 Milli Eđitim Bakanlıđı Arařtırma Uygulama İzinleri konulu yazının okunmasına dair taahhüt
Arařtırmacıların her birisine ait özgeçmiř formu
Ek belgeler (Varsa kullanılan ölçek)

Prof. Dr. Didem ÖZDEMİR
ÖZENEN
Bařkan

Doç. Dr. Gökhan ERTAŐ
Bařkan Yardımcısı

Doç. Dr. Elif SUNGURTEKİN EKÇİ
Raportör

Prof. Dr. Feryal SUBAŐI
Üye

Doç. Dr. Binnur OKAN
BAKIR
Üye

Dr. Öđr. Üyesi Emine Nur
ÖZDAMAR
Üye

Dr. Öđr. Üyesi Sevim ŐEN
Üye

Bu belge, güvenli elektronik imza ile imzalanmıřtır.

Belge Dođrulama Adresi : <http://belgedogrulama.yeditepe.edu.tr/bg.aspx?id=87CC07D8-67E4-4E94-ADAF-04338290D284>

Yeditepe Üniversitesi 26 Ađustos Yerleřimi, İnönü Mahallesi Kayıřdađı

Caddesi 34755

Atařehir / İSTANBUL

Telefon No: (0216) 578 00 00 Faks No : (0216) 578 02 99

İnternet Adresi www.yeditepe.edu.tr

Kep Adresi : yeditepeuniversitesi@hs03.kep.tr

Bilgi İçin: Sevgi BAYRAKTAR

Unvan: Uzman Yardımcısı

Telefon No:



8.5. Appendix 5 (Curriculum Vitae)

Personal Information

Name	Senem	Surname	Yumuşak
Place of Birth		Date of Birth	
Nationality		Telephone	
E-mail			

Education Status

Degree	Department	Name of the School	Year of Graduation
Postgraduate	Department of Nutrition and Dietetics	Yeditepe University	2021-Now
Undergraduate	Department of Nutrition and Dietetics	Yeditepe University	2016-2021
High School		Private Cagdas Oncu Anatolian High School	2015-2016

Foreign Languages	Language Score
English (YDS)	71,25

Computer Knowledge

Program	Usage
Microsoft Office	Very good
Adobe	Moderate