

ORIGINAL RESEARCH ORJİNAL ARAŞTIRMA

DOI: 10.5336/healthsci.2025-109306

# Complex Interactions Between Obesity and Food Addiction Among Office Workers: The Role of Personality Factors: An Analytical Research

## Ofis Çalışanları Arasında Obezite ve Gıda Bağımlılığı Arasındaki Karmaşık Etkileşimler: Kişilik Faktörlerinin Rolü: Analitik Araştırma

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**ABSTRACT Objective:** The study aims to unravel the intricate relationship between obesity, food addiction, and personality traits among office workers. **Material and Methods:** To achieve this goal, the researchers employed various tools, including sociodemographic data forms, the Yale Food Addiction Scale, the Urgency, Premeditation, Perseverance, Sensation Seeking Impulsive Behavior Scale, and the Five Factor Personality Inventory. **Results:** The results reveal nuanced interactions between food addiction and personality traits across different body mass index (BMI) categories. Among those with a normal BMI, no significant correlations were found between food addiction and personality dimensions like extraversion, neuroticism, agreeableness, conscientiousness, or openness to experience ( $p>0.050$ ). However, for mildly obese individuals, heightened extraversion linked to an increase in food addiction ( $\beta=0.425$ ;  $p=0.011$ ), while among the obese, higher impulsivity corresponded to elevated food addiction ( $\beta=2.141$ ;  $p<0.001$ ). Furthermore, changes in extraversion, conscientiousness, and openness to experience exhibited varying effects on food addiction among the obese. **Conclusion:** These findings provide valuable insights into the complex interplay between obesity, food addiction, and personality traits among office workers. The results could potentially inform more effective strategies for managing obesity and treating food addiction, by incorporating factors such as extraversion and impulsivity into intervention programs.

**Keywords:** Obesity; food addiction; personality assessment; body mass index; impulsive behavior

**ÖZET Amaç:** Bu çalışma, ofis çalışanları arasında obezite, gıda bağımlılığı ve kişilik özellikleri arasındaki karmaşık ilişkiyi ortaya çıkarmayı amaçlamaktadır. **Gereç ve Yöntemler:** Bu amaca ulaşmak için araştırmacılar sosyodemografik veri formları, Yale Gıda Bağımlılığı Ölçeği, Aciliyet, Önceden Planlama, Azim, Duygu Arayışı Dürtüsel Davranış Ölçeği ve Beş Faktör Kişilik Envanteri gibi çeşitli araçlar kullanmışlardır. **Bulgular:** Sonuçlar, farklı beden kitle indeksi (BKİ) kategorilerinde gıda bağımlılığı ve kişilik özellikleri arasındaki nüanslı etkileşimleri ortaya koymaktadır. Normal BKİ'ye sahip olanlar arasında, gıda bağımlılığı ile dışadönüklük, nevroz, uyumluluk, vicdanlılık veya deneyime açıklık gibi kişilik boyutları arasında anlamlı bir ilişki bulunmamıştır ( $p>0.050$ ). Bununla birlikte, hafif obez bireyler için, artan dışadönüklük gıda bağımlılığında bir artışla bağlantılı iken ( $\beta=0.425$ ;  $p=0.011$ ), obezler arasında, daha yüksek dürtüsellik artan gıda bağımlılığına karşılık gelmiştir ( $\beta=2.141$ ;  $p<0.001$ ). Ayrıca, dışadönüklük, vicdanlılık ve deneyime açıklıktaki değişiklikler obezler arasında gıda bağımlılığı üzerinde farklı etkiler sergilemiştir. **Sonuç:** Bu bulgular, ofis çalışanları arasında obezite, gıda bağımlılığı ve kişilik özellikleri arasındaki karmaşık etkileşim hakkında değerli bilgiler sağlamaktadır. Sonuçlar, dışadönüklük ve dürtüsellik gibi faktörleri müdahale programlarına dâhil ederek obeziteyi yönetmek ve gıda bağımlılığını tedavi etmek için daha etkili stratejileri potansiyel olarak bilgilendirebilir.

**Anahtar Kelimeler:** Obezite; gıda bağımlılığı; kişilik değerlendirilmesi; beden kitle indeksi; dürtüsel davranış

Food addiction is defined as the “hedonic eating behavior”, involving the consumption of highly palatable foods (highly preferred foods) beyond the uni-

versal energy requirements. The preference for such foods and the convergence of addiction-like behaviors are increasingly discussed as a potential contrib-

**TO CITE THIS ARTICLE:**

Uslu B, İlengiz KA. Complex interactions between obesity and food addiction among office workers: The role of personality factors: An analytical research. Türkiye Klinikleri J Health Sci. 2025;10(3):577-83.

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Peer review under responsibility of Türkiye Klinikleri Journal of Health Sciences.

**Received:** 06 Feb 2025

**Received in revised form:** 27 Mar 2025

**Accepted:** 27 Mar 2025

**Available online:** 20 Jun 2025

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utor to obesity. The obesity epidemic is supported by obesogenic environments, including the widespread availability of cheap, highly processed foods, large portion sizes, added sugars, and access to technologies that reduce or replace daily physical activity.<sup>1</sup> Especially office workers are exposed to low levels of physical activity due to prolonged sitting times and unhealthy eating habits due to the presence of an obesogenic environment.<sup>2</sup> Impulsivity is a multidimensional concept characterized by deficient inhibition processes and low self-control. Essentially, 3 distinct components of impulsivity can be discerned: impulsive personality trait, impulsive actions involving deficits in behavioral inhibition (action withdrawal, action cancellation), and impulsive choices favoring immediate rewards over long-term goals. Individuals experiencing food addiction tend to report a tendency towards immediately consumable high-caloric foods, yet they struggle to resist eating impulses. In general, individuals with food addiction are characterized by high impulsivity traits.<sup>3</sup> The workplace environment plays a significant role in shaping the eating habits of office workers, reflecting the complex interaction triggering impulsivity and consequently food addiction. The interaction between office workers' eating habits and personality factors is increasingly of interest in research literature, aiming to illuminate the role of individual traits in shaping dietary preferences. In this context, previous studies have reported the association between personality traits and eating behavior, emphasizing the necessity for further research to achieve a broader understanding.<sup>4-6</sup> Within this scope, the complexity of the relationship between impulsivity and food addiction among office workers, and how this relationship is influenced by personality factors, has become a subject of great curiosity. In this regard, it is essential for researchers to delve further into these complex relationships in order to develop more specific and effective intervention methods in line with body mass index (BMI) categories and focused on food addiction. The complexity of the relationship between obesity, food addiction, and impulsivity, as well as the influence of personality factors, forms an important field of research that necessitates a more comprehensive investigation. In this context, the aim of our study is to understand the relationships between obesity, food

addiction, and impulsivity among office workers, and to illuminate the underlying mechanisms of these relationships. To achieve this goal, a comprehensive analysis of participants' eating habits, personality traits, and obesity status is planned.

## MATERIAL AND METHODS

This study received ethical approval from the Non-Interventional Ethics Committee of Yüksek İhtisas University with the decision dated February 22, 2023 and numbered 2023-02/22. All studies involving the "Human" element in this research were conducted in accordance with the principles of the 2008 Declaration of Helsinki.

### PARTICIPANTS AND SAMPLE SIZE

This study was conducted with individuals selected among white-collar office workers working in banks operating in Ankara. Participants were included in the study through online and face-to-face surveys on a voluntary basis. The population of the study was determined as the population of white-collar employees in various banks in Ankara. The data collection process of the study was carried out after obtaining ethical approval.

The sample size was determined using power analysis. As a result of the calculations made using G\*Power 3.1 software (Heinrich Heine University, Düsseldorf, Germany), it was determined that the study should be conducted with at least 112 participants based on a medium-sized effect (Cohen's  $d=0.5$ ), 80% power, and a 5% significance level ( $\alpha=0.05$ ). However, considering the possibility of data loss, a total of 117 participants were included in the study. The following criteria were considered for participation in the study: 18 years of age or older, being in active working life as a white-collar office worker, completion of the informed consent form. Exclusion criteria included a history of previously diagnosed eating disorders, serious psychiatric illnesses, or incomplete responses to the study data.

### DATA COLLECTION TOOLS

#### Yale Food Addiction Scale

Individuals' food addiction was assessed through the Yale Food Addiction Scale. The scale, developed by

Gearhardt et al. in 2009, and its Turkish validity and reliability were conducted by Bayraktar et al. in 2012. The scale consists of 27 items and is used to measure addictive-like eating behaviors towards specific food types within the past 12 months. It comprises 8 symptoms, and the scoring is calculated based on the total score of questions related to each symptom.<sup>7</sup> If the symptom score is  $<3$ , the individual does not have food addiction. However, if the symptom score is  $\geq 3$  and the individual obtains 1 point from either the 15<sup>th</sup> or 16<sup>th</sup> question in the scale, they are diagnosed with food addiction.<sup>8</sup>

### UPPS Impulsive Behavior Scale

It is a self-report scale consisting of 45 items, divided into four factors: impulsivity, lack of planning, perseverance, and sensation seeking. The scale uses a four-point Likert-type response format, where participants can respond as “does not apply to me at all” or “applies to me very much”.<sup>9</sup> The factor of “Urgency” assesses the tendency to engage in impulsive behaviors to escape stress in conditions that lead to negative emotions. “Premeditation” measures the tendency to act without thinking about the consequences before starting an action and not making plans. “Perseverance” evaluates the difficulty of maintaining focus on long, boring, or challenging tasks. Lastly, “sensation seeking” assesses the inclination to engage in exciting, pleasurable, risky activities and being open to potentially dangerous new experiences. In the Turkish validity and reliability study, Cronbach’s alpha coefficients were calculated as 0.85 for lack of planning, 0.80 for impulsivity, 0.85 for sensation seeking, 0.80 for perseverance, and 0.84 for the entire scale.<sup>10</sup>

### Five Factor Personality Inventory

The Five Factor Personality Inventory was developed by John et al.<sup>11</sup> Originally known as “The Big Five Inventory”, this scale consists of 44 items using a 5-point Likert-type response format. The inventory measures five factors: extraversion (8 items), neuroticism/emotional instability (8 items), agreeableness/tenderness (9 items), conscientiousness/self-discipline (9 items), and openness to experience (10 items). In this study, the Turkish adaptation of the Five Factor Personality Inventory, done by Sümer

and Sümer, was used.<sup>11</sup> High scores in each subscale indicate a higher level of the respective personality trait. Sümer reported Cronbach’s alpha values for the dimensions of the scale to be between 0.64-0.77.<sup>11</sup> In this current study, the obtained Cronbach’s alpha values for all subscales of the inventory are as follows: Extraversion subscale has a Cronbach’s alpha value of 0.70, agreeableness subscale has a Cronbach’s alpha value of 0.63, conscientiousness subscale has a Cronbach’s alpha value of 0.70, neuroticism subscale has a Cronbach’s alpha value of 0.73, and openness subscale has a Cronbach’s alpha value of 0.73. Looking at the calculated Cronbach’s alpha values for the subscales of the Five Factor Personality Inventory, it can be observed that all scales fall between 0.60-0.90.<sup>11</sup>

### DATA ANALYZES

IBM SPSS Statistics (version 23) software (IBM Corp., Armonk, NY, USA) was used to analyze the data obtained in the study. Kolmogorov-Smirnov and Shapiro-Wilk tests were applied to evaluate the normality distribution of the data. Frequencies and percentages of categorical variables were calculated. Mean and standard deviation values were reported for continuous variables. Independent sample t-test and analysis of variance were applied to examine differences between groups. Pearson correlation analysis was performed to determine the relationship between personality traits and food addiction. Multiple regression analysis was applied to determine the effect of variables on food addiction. The significance level was accepted as  $p < 0.05$ .

## RESULTS

Table 1 presents the descriptive statistics of the participants. According to the table, the total number of participants is 117. Of these participants, 33.3% (39 individuals) are male, and 66.7% (78 individuals) are female. Regarding marital status, 41% (48 individuals) are single, while 59% (69 individuals) are married. In terms of BMI categories, 2.6% (3 individuals) are underweight, 53% (62 individuals) are normal, 30.8% (36 individuals) are overweight, and 13.7% (16 individuals) are classified as obese.

Table 2 presents the statistical analysis results of the relationships between eating addiction and per-

**TABLE 1:** Demographic characteristics of participants

	n=117	Percentage (%)
Gender		
Male	39	33.3
Female	78	66.7
Marital status		
Single	48	41
Married	69	59
BMI category		
Underweight	3	2.6
Normal	62	53
Overweight	36	30.8
Obese	16	13.7
	$\bar{X} \pm SD$	Median (minimum-maximum)
Age (years)	42.58 $\pm$ 12.84	42 (19-74)
Weight (kg)	70.81 $\pm$ 15.35	70 (47-120)
Height (cm)	168.40 $\pm$ 8.40	168 (150-189)

SD: Standard deviation; BMI: Body mass index

sonality traits among individuals with different BMI categories. Among individuals with a normal BMI, there is no significant relationship between eating addiction and impulsivity, extraversion, conscientiousness, agreeableness, openness to experience, and the interactions between these personality traits ( $p>0.050$ ). Among individuals classified as slightly overweight, an increase in extraversion is associated with an increase in eating addiction ( $\beta_1=0.425$ ;  $p=0.011$ ). For obese individuals, an increase in impulsivity is linked to an increase in eating addiction ( $\beta_1=2.141$ ;  $p<0.001$ ). Furthermore, among obese individuals, an increase in extraversion is positively associated with an increase in eating addiction ( $\beta_1=0.704$ ;  $p=0.031$ ). The rise of conscientiousness among obese individuals is linked to an increase in eating addiction ( $\beta_1=2.057$ ;  $p<0.001$ ). Conversely, an

**TABLE 2:** Analysis of the relationships between personality traits and food addiction according to BMI categories

				$\beta_0$	$\beta_1$	Standard Error	Test statistic	p value	R <sup>2</sup>
Normal	YYBO_G	<---	Impulsivity	0.601	0.147	0.633	0.949	0.343	0.222
	YYBO_G	<---	Extraversion	0.195	0.049	0.673	0.29	0.772	
	YYBO_G	<---	Conscientiousness	-0.673	-0.185	0.547	-1.232	0.218	
	YYBO_G	<---	Agreeableness	0.812	0.205	0.624	1.301	0.193	
	YYBO_G	<---	Openness to experience	0.369	0.097	0.595	0.621	0.535	
	YYBO_G	<---	Neuroticism	1.057	0.296	0.547	1.933	0.053	
	YYBO_G	<---	ZXW1	-1.097	-0.325	0.715	-1.533	0.125	
	YYBO_G	<---	ZXW2	-0.583	-0.181	0.493	-1.181	0.237	
	YYBO_G	<---	ZXW3	0.887	0.256	0.609	1.455	0.146	
	YYBO_G	<---	ZXW4	-0.115	-0.034	0.549	-0.21	0.834	
Overweight	YYBO_G	<---	ZXW5	-0.209	-0.063	0.578	-0.362	0.717	0.411
	YYBO_G	<---	Impulsivity	0.488	0.101	0.962	0.507	0.612	
	YYBO_G	<---	Extraversion	2.319	0.425	0.912	2.544	<b>0.011</b>	
	YYBO_G	<---	Conscientiousness	-0.835	-0.147	0.92	-0.907	0.364	
	YYBO_G	<---	Agreeableness	-1.264	-0.265	0.891	-1.419	0.156	
	YYBO_G	<---	Openness to experience	0.013	0.002	1.002	0.012	0.990	
	YYBO_G	<---	Neuroticism	0.552	0.104	0.929	0.594	0.552	
	YYBO_G	<---	ZXW1	-1.036	-0.198	1.099	-0.943	0.346	
	YYBO_G	<---	ZXW2	-0.568	-0.108	0.882	-0.644	0.519	
	YYBO_G	<---	ZXW3	-1.21	-0.286	0.835	-1.45	0.147	
Obese	YYBO_G	<---	ZXW4	2.391	0.357	1.492	1.602	0.109	0.654
	YYBO_G	<---	ZXW5	-0.182	-0.045	0.685	-0.266	0.790	
	YYBO_G	<---	Impulsivity	7.695	2.141	2.183	3.526	<b>&lt;0.001</b>	
	YYBO_G	<---	Extraversion	2.43	0.704	1.127	2.157	<b>0.031</b>	
	YYBO_G	<---	Conscientiousness	8.334	2.057	2.376	3.508	<b>&lt;0.001</b>	
	YYBO_G	<---	Agreeableness	0.308	0.085	1.293	0.238	0.812	
	YYBO_G	<---	Openness to experience	-8.487	-2.605	2.37	-3.582	<b>&lt;0.001</b>	
	YYBO_G	<---	Neuroticism	3.002	0.583	1.96	1.532	0.126	
	YYBO_G	<---	ZXW1	-1.686	-0.653	1.136	-1.484	0.138	
	YYBO_G	<---	ZXW2	-4.825	-1.541	2.183	-2.21	<b>0.027</b>	
	YYBO_G	<---	ZXW3	-3.288	-0.840	1.099	-2.992	<b>0.003</b>	
	YYBO_G	<---	ZXW4	0.231	0.082	1.747	0.132	0.895	
	YYBO_G	<---		-2.926	-0.500	3.072	-0.952	0.341	
	YYBO_G	<---							

$\beta_0$ : Unstandardized path coefficients;  $\beta_1$ : Standardized path coefficients; YYBO\_G: Yale Food Addiction Scale general score; ZXW1: St.Impulsivity extraversion; ZXW2: St.Impulsivity conscientiousness; ZXW3: St.Impulsivity agreeableness; ZXW4: St.Impulsivity openness to experience; ZXW5: St.Impulsivity\*neuroticism

increase in openness to experience among obese individuals is associated with a decrease in eating addiction ( $\beta_1 = -2.605$ ;  $p < 0.001$ ). Additionally, among obese individuals, an interaction between impulsivity and conscientiousness shows that an increase in this interaction leads to a decrease in eating addiction ( $\beta_1 = -1.541$ ;  $p = 0.027$ ). Similarly, an interaction between impulsivity and agreeableness among obese individuals demonstrates that an increase in this interaction results in a decrease in eating addiction ( $\beta_1 = -0.840$ ;  $p = 0.003$ ).

## DISCUSSION

This study illuminates the complex relationships between personality traits and food addiction among white-collar office workers with different BMI categories. The results of the statistical analyses provide valuable insights into these relationships and help us gain a deeper understanding of the connections between various personality dimensions and the presence of food addiction. Interestingly, there appears to be no significant association between personality traits such as impulsivity, extraversion, conscientiousness, agreeableness, openness, and food addiction among individuals within the normal BMI range ( $p > 0.050$ ). This suggests that among individuals with normal BMI, these personality traits may not be strongly linked to the likelihood of engaging in food addiction behaviors. Comparatively, a similar study conducted among obese women with no eating pathology and normal-weight controls demonstrated that individuals with eating disorders among obese women exhibit significantly higher levels of negative urgency (tendency to act hastily) compared to both non-eating disordered obese women and normal-weight controls.<sup>12</sup> Similar findings have been observed in another study, suggesting that obese individuals are more impulsive in behavioral measures not limited by self-insight when compared to normal-weight individuals.<sup>13</sup> Furthermore, impulsive individuals are proposed to be more susceptible to the influence of negative emotional states in emotional eating behaviors; this is supported by findings from an experimental study involving mood induction.<sup>14</sup> Therefore, it is hypothesized that impulsive individuals may exhibit less resistance to emotional eating

tendencies when confronted with adverse life events.<sup>5</sup> In this context, while no significant relationship between impulsiveness and personality traits was found among individuals with normal BMI or slight overweight, such a relationship was identified among obese individuals. According to existing literature, most current research tends to focus on explaining how an individual's BMI affects their psychosocial status, such as depression, subjective well-being, and similar factors, with limited academic interest in exploring this relationship in the opposite direction.<sup>15,16</sup> Thus, in this study, we aimed to investigate the impact of psychosocial factors, including personality traits and food addiction, among white-collar office workers. The value of our approach has been confirmed, as we found that individuals with slightly overweight or obesity who have higher extraversion personality traits tend to exhibit higher levels of food addiction. This finding aligns with a study that discovered that children with extroverted and impulsive personality traits tend to eat faster and have a higher risk of obesity compared to children who eat more slowly.<sup>17</sup> Our study confirms the applicability of this finding to the population of white-collar office workers. Additionally, we found that as the trait of conscientiousness, associated with a sense of responsibility, increases in obese individuals, their tendency towards food addiction also increases. It is noteworthy that responsible individuals are characterized by being disciplined, task-oriented, and organized, while low conscientiousness is linked to weak self-control, impulsivity, and a lack of long-term planning.<sup>18</sup> Hence, the results we obtained are quite intriguing. A previous study conducted by Bégin and colleagues indicated that individuals exhibiting symptoms of food addiction may face difficulties in setting and focusing on long-term goals, especially when short-term rewards are present.<sup>19</sup> Motivated by these observations, we aimed to delve deeper into this relationship from a different perspective. Consequently, we found that in obese individuals who act with a sense of responsibility, the interaction between impulsiveness and this trait results in a decrease in food addiction tendencies. This implies that while it might initially seem that individuals with high responsibility might exhibit an increase in food addiction, the presence of impulsiveness might counteract this effect and play a role in



reducing food addiction tendencies. Openness to experience encompasses imagination, aesthetics, emotions, actions, ideas, and values, while agreeableness includes trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness. Higher BMI is associated with lower openness to experience; however, the relationship between BMI and these traits has been studied to a limited extent.<sup>20,21</sup> In this regard, our study adds valuable insights to the literature. Our study also found that as the interaction between impulsiveness and emotional stability personality traits increases among obese individuals, the tendency towards food addiction decreases. This interaction might be particularly pronounced in individuals characterized by high impulsiveness (impulsivity) and low emotional stability (emotional stability). In other words, the impulsive behaviors and emotional instability of such individuals could lead to an escalated pattern of eating behavior that is less controlled. These individuals might respond quickly and thoughtlessly to sudden cravings, leading to overeating or food addiction. Therefore, this specific interaction between impulsiveness and emotional stability might be a factor that increases food addiction among obese individuals. Furthermore, lower openness to experience might stimulate the production of stress hormones (e.g., cortisol), leading to increased food cravings and weight gain.<sup>22</sup> However, published studies did not find a significant association between higher openness to experience and being overweight or obese. Instead, lower openness to experience was related to an earlier onset of depression in the elderly.<sup>23</sup> When reviewing the literature, it seems that our study's findings are in line with existing research.

## LIMITATIONS

Some of the limitations of this study offer new research areas for future research: longitudinal studies: Since our study was conducted using a cross-sectional design, it was not possible to determine the cause-and-effect relationships between variables. Future longitudinal studies will allow us to better understand the dynamics of the relationship between personality traits and food addiction over time. Investigations in different occupational groups: as our study only covered white-collar office workers, it is important to test whether similar relationships hold

across different occupational groups (e.g. blue-collar workers, self-employed). Use of objective measures: Self-report questionnaires were used to assess personality traits and food addiction, which may lead to methodological limitations such as social desirability bias. The use of more objective measures such as behavioral observations, neuropsychological tests or biomarkers is recommended for future studies. Investigation of mechanistic processes: Examining the neurocognitive and emotional mechanisms underlying the associations between personality traits and food addiction could further expand the body of knowledge in this area. For example, brain imaging studies or experimental intervention research could provide a better understanding of the neural pathways underlying these associations.

## CONCLUSION

This study contributes to the literature by examining the relationship between personality traits and food addiction in the context of white-collar office workers. The findings show that personality traits are differentially associated with food addiction in individuals with different BMI categories. In particular, extraversion and conscientiousness were positively associated with food addiction in slightly overweight and obese individuals. In addition, as the interaction of impulsivity and emotional stability traits increased, it was observed that the tendency for food addiction decreased in obese individuals. However, no significant relationship was found between the examined personality traits and food addiction in individuals with normal BMI range. This study contributes to the limited number of studies in the literature that examine the impact of psychosocial factors (e.g., personality traits) on food addiction, unlike the studies that generally focus on the effects of BMI on psychosocial status. The findings suggest that personality traits such as extraversion and conscientiousness are associated with food addiction in obese individuals, suggesting that food addiction is not only an impulsivity-based phenomenon. Moreover, by considering the complex interactions of personality traits, this study emphasizes the regulatory role of the interaction between emotional stability and impulsivity on food addiction, adding a new perspective to

the existing literature. In conclusion, this study contributes to both theoretical and applied fields by comprehensively addressing the relationships between personality traits and food addiction. Future research should examine food addiction in more depth, taking into account individual differences and psychosocial factors, and provide scientific evidence for the development of interventions in this area.

### Source of Finance

This study was supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) within the scope of the

2209-A Research Project Support Programme for Undergraduate Students (Project No: 1919B012216644).

### Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

### Authorship Contributions

All authors contributed equally while this study preparing.

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