

## Obesity and Hedonic Hunger: Associations with Healthy Eating Attitudes and Nutrition Knowledge

Ayşe Betül DEMİRBAŞ BİLEN\*, Eda Hanım METİN\*\*, Fulya İlayda ALINLI\*\*\*, Beyzanur KAR\*\*\*\*, Sena AVUNCAN\*\*\*\*\*, Özgül Sude ÖZTÜRK\*\*\*\*\*, Ayşenur EMİRHÜSEYİNOĞLU ÇALIK\*\*\*\*\*

### Abstract

**Aim:** This study aims to compare the hedonic hunger, attitudes towards healthy eating, and nutritional knowledge levels of adult obese individuals with those of healthy individuals.

**Method:** This cross-sectional and descriptive study was conducted between November 2024 and December 2024 with 198 obese participants and 198 healthy participants with a normal body mass index residing in the Kağıthane district. The participants were administered the General Information Form, the Attitude Scale for Healthy Nutrition (ASHN), the Nutrition Knowledge Scale (NKS), and the Power of Food Scale (PFS). Data were collected through an online survey method using Google Forms and analyzed using the SPSS 25.0 software.

**Results:** A significant relationship was found between the total score average of the Attitudes Towards Healthy Eating Scale (ASHN) and its subdimensions—poor eating, positive eating, and emotional attitudes towards eating—in obese individuals based on hedonic hunger ( $p < 0.05$ ). A significant relationship was also observed between hedonic hunger and the total score of the Nutrition Knowledge Scale (NKS) in obese individuals ( $p < 0.05$ ). Among healthy individuals, significant differences were detected in the subdimensions of poor eating and emotional attitudes towards eating related to hedonic hunger ( $p < 0.05$ ), while no significant difference was found in the total NKS scores ( $p > 0.05$ ). In healthy individuals, participants with hedonic hunger had lower total ASHN scores and lower subdimension scores for poor eating and emotional attitudes towards eating compared to those without hedonic hunger ( $p < 0.05$ ).

**Conclusion:** It was observed that the healthy eating attitudes and nutritional knowledge levels of obese individuals differed significantly from those of healthy individuals. Additionally, obese individuals were found to have higher levels of hedonic hunger, which was negatively associated with attitudes and behaviors

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\* Asst. Prof., Istanbul Atlas University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Istanbul, Türkiye. E-mail: [ayse.demirbas@atlas.edu.tr](mailto:ayse.demirbas@atlas.edu.tr) [ORCID https://orcid.org/0000-0003-2765-2677](https://orcid.org/0000-0003-2765-2677)

\*\* Dietitian, Istanbul Atlas University, Postgraduate Education Institute, Department of Nutrition and Dietetics, Istanbul, Türkiye. E-mail: [dytedametin@gmail.com](mailto:dytedametin@gmail.com) [ORCID https://orcid.org/0009-0000-1074-7106](https://orcid.org/0009-0000-1074-7106)

\*\*\* Dietitian, Istanbul Atlas University, Postgraduate Education Institute, Department of Nutrition and Dietetics, Istanbul, Türkiye. E-mail: [dyt.fulyailayda@gmail.com](mailto:dyt.fulyailayda@gmail.com) [ORCID https://orcid.org/0000-0003-1967-5764](https://orcid.org/0000-0003-1967-5764)

\*\*\*\* Dietitian, Istanbul Atlas University, Postgraduate Education Institute, Department of Nutrition and Dietetics, Istanbul, Türkiye. E-mail: [elizabeth66@gmail.com](mailto:elizabeth66@gmail.com) [ORCID https://orcid.org/0009-0009-3592-4645](https://orcid.org/0009-0009-3592-4645)

\*\*\*\*\* Dietitian, Istanbul Atlas University, Postgraduate Education Institute, Department of Nutrition and Dietetics, Istanbul, Türkiye. E-mail: [dyt.senavuncan@gmail.com](mailto:dyt.senavuncan@gmail.com) [ORCID https://orcid.org/0009-0003-3468-8253](https://orcid.org/0009-0003-3468-8253)

\*\*\*\*\* Dietitian, Istanbul Atlas University, Postgraduate Education Institute, Department of Nutrition and Dietetics, Istanbul, Türkiye. E-mail: [dytsudeozturk@gmail.com](mailto:dytsudeozturk@gmail.com) [ORCID https://orcid.org/0009-0001-8464-0755](https://orcid.org/0009-0001-8464-0755)

\*\*\*\*\* Res. Asst., Istanbul Atlas University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Istanbul, Türkiye. E-mail: [ayse.emirhuseyinoglu@atlas.edu.tr](mailto:ayse.emirhuseyinoglu@atlas.edu.tr) [ORCID https://orcid.org/0000-0001-5823-617X](https://orcid.org/0000-0001-5823-617X)

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supporting healthy eating and appeared to undermine healthy eating behaviors. These findings highlight that hedonic hunger is a critical factor that should not be overlooked in combating obesity and suggest that increasing knowledge alone may not be sufficient. Accordingly, interventions aimed at managing hedonic hunger levels are important for obesity prevention and management. Within the scope of obesity prevention and management strategies, it is considered beneficial to develop nutrition education programs alongside interventions targeting hedonic hunger and to establish health policies that promote healthy eating attitudes. Further research on this subject would be valuable, particularly to clarify the direction of the relationship between hedonic hunger and healthy eating and to develop effective intervention methods.

**Keywords:** Hedonic hunger, obesity, healthy nutrition, nutrition knowledge, eating behavior.

## Obezite ve Hedonik Açlık: Sağlıklı Beslenme Tutumu ve Beslenme Bilgisi ile İlişkisi

### Öz

**Amaç:** Bu çalışmada yetişkin obez bireylerin hedonik açlık, sağlıklı beslenmeye ilişkin tutum ve beslenme bilgi düzeyinin sağlıklı bireyler ile karşılaştırılması amaçlanmıştır.

**Yöntem:** Kesitsel ve tanımlayıcı tipteki bu çalışma, Kasım 2024-Aralık 2024 tarihleri arasında Kağıthane ilçesinde yaşayan 198 obez, 198 normal beden kütle indeksine sahip sağlıklı katılımcılar ile yürütülmüştür. Çalışmaya katılan katılımcılara Genel Bilgiler Formu, Sağlıklı Beslenmeye İlişkin Tutum Ölçeği (SBİTÖ), Beslenme Bilgi Ölçeği (BBÖ) ve Besin Gücü Ölçeği (BGÖ) kullanılmıştır. Veriler Google Forms ile online anket yöntemiyle toplanmıştır. Veriler SPSS 25.0 programında değerlendirilmiştir.

**Bulgular:** Obez hedonik açlığa göre SBİTÖ toplam puan ortalaması ve SBİTÖ alt boyutları kötü beslenme, olumlu beslenme ve beslenmeye yönelik duygu puan ortalamaları arasında anlamlı bir ilişki bulunmuştur ( $p < 0,05$ ). Obez bireylerde hedonik açlık ile Beslenme Bilgi Ölçeği (BBÖ) toplam puanı arasında anlamlı bir ilişki ( $p < 0,05$ ) bulunmuştur. Sağlıklı bireylerde ise hedonik açlık, kötü beslenme ve beslenmeye yönelik duygularla ilgili alt boyutlarda anlamlı farklar ( $p < 0,05$ ) saptanırken, BBÖ toplam puanları açısından anlamlı bir fark bulunmamıştır ( $p > 0,05$ ). Sağlıklı bireylerde hedonik açlığı olan katılımcıların SBİTÖ toplam puanı ve SBİTÖ alt boyutları kötü beslenme ve beslenmeye yönelik duygu puan ortalamaları hedonik açlığı olmayanlara göre daha düşüktür ( $p < 0,05$ ).

**Sonuç:** Obez bireylerin sağlıklı beslenme tutumlarının ve beslenme bilgisi düzeylerinin sağlıklı bireylerden anlamlı derecede farklı olduğu gözlemlenmiştir. Ayrıca, obez bireylerde hedonik açlık düzeylerinin daha yüksek olduğu ve hedonik açlığın sağlıklı beslenmeyi destekleyen tutum ve davranışlarla olumsuz yönde ilişkili olduğu saptanmıştır. Bu sonuç, obeziteyle mücadelede hedonik açlığın göz ardı edilemeyecek kritik bir değişken olduğunu ve yalnızca bilgi artırmanın tek başına yeterli olmayabileceğini göstermektedir. Bu nedenle obeziteyi önleme ve yönetme stratejileri kapsamında, beslenme eğitimi programlarının yanı sıra hedonik açlığı yönetmeye yönelik müdahalelerin planlanması ve sağlıklı beslenmeyi destekleyen sağlık politikalarının geliştirilmesi yararlı olacaktır. Bu konuda daha fazla çalışma yapılması, özellikle hedonik açlık ile sağlıklı beslenme arasındaki ilişkinin yönünü ve etkili müdahale yöntemlerini ortaya koymak açısından önemlidir.

**Anahtar Sözcükler:** Hedonik açlık, obezite, sağlıklı beslenme, beslenme bilgisi, yeme davranışı.

## Introduction

Obesity has emerged as a significant public health issue in both developed and developing nations. It occurs when the energy consumed exceeds the energy expended, and the World Health Organization (WHO) defines it as an excessive accumulation of fat

that adversely affects health<sup>1</sup>. Furthermore, obesity impacts not only physical health but also has detrimental effects on psychological and social well-being<sup>2</sup>.

Numerous factors contribute to the development of obesity, with hedonic hunger emerging as a significant element<sup>3</sup>. Hedonic hunger refers to the consumption of food for pleasure rather than biological necessity<sup>4</sup>. This phenomenon is characterized by an individual's persistent thoughts about food, which are triggered by external stimuli (such as seeing or smelling food, advertisements) and internal stimuli (including stress, emotional fluctuations, and rewarding behaviors). The easy accessibility of high-calorie foods, particularly those rich in fats and sugars, along with large portion sizes and changes in the food environment, significantly enhances the impact of hedonic hunger and contributes to the development of obesity<sup>5</sup>.

An individual's attitude towards healthy eating is a significant factor that reflects how they perceive their dietary habits and food choices, as well as the importance they assign to these choices. This attitude plays a crucial role in determining their success in achieving health-related goals. A positive attitude towards healthy eating typically encourages the selection of balanced and nutritious foods, whereas negative attitudes may lead to preferences for unhealthy food options<sup>6</sup>.

Nutritional knowledge refers to the level of understanding individuals possess regarding proper and healthy eating. Adequate nutritional knowledge aids individuals in making appropriate food choices, thereby promoting a healthy lifestyle in the long term. Conversely, insufficient nutritional knowledge can lead to the development of poor eating habits. In this context, attitudes towards healthy eating and nutritional knowledge are significant factors that should be assessed together with hedonic hunger, as they play a crucial role in shaping individuals' healthy eating behaviors<sup>7</sup>.

Research suggests that eating behavior in obesity is not solely driven by energy requirements; rather, it is closely related to environmental food cues, sensory pleasure components, and reward-related processes<sup>5</sup>. In this context, hedonic hunger represents a construct that can increase sensitivity to the appetitive appeal of food independent of physiological energy needs and has been found to be associated with obesity status<sup>3</sup>. Heightened hedonic orientation may hinder the regulation of eating behavior, making it more difficult to sustain healthy eating and potentially contributing to an increased risk of weight gain. Moreover, hedonic hunger may be linked to cognitive processes such as perceived control and confidence regarding eating behavior; therefore, it may adversely affect not only dietary habits but also individuals' beliefs about their capacity to manage eating behavior<sup>5</sup>.

Hedonic hunger is a significant mechanism that directly influences individuals' eating behaviors, interacting with biological and environmental factors in the development of obesity<sup>6</sup>. The perceived importance of taste and pleasure in food consumption (palatability) may encourage individuals to choose energy-dense, highly palatable foods, thereby increasing energy intake and potentially contributing to the rise in obesity rates

worldwide<sup>7</sup>. Understanding hedonic hunger is crucial for the prevention and treatment of obesity, as it allows for the development of tailored strategies for individuals<sup>8</sup>.

This study aimed to compare hedonic hunger levels, attitudes toward healthy eating, and nutrition knowledge between adults with obesity and healthy individuals with a normal BMI. Accordingly, the study addressed the following research questions: (i) Do hedonic hunger, healthy eating attitudes, and nutrition knowledge differ between obese and healthy individuals? (ii) Is hedonic hunger associated with the subdimensions of attitudes toward healthy eating in both groups? (iii) Among obese individuals, is hedonic hunger associated with nutrition knowledge? Based on these questions, we hypothesized that individuals with obesity would exhibit higher levels of hedonic hunger and that hedonic hunger would be negatively associated with indicators of attitudes that support healthy eating.

## **Material and Methods**

### ***Research Time, Place and Sample Selection***

The sample of this cross-sectional and descriptive study consists of adult participants aged 18-65 years with obesity and normal Body Mass Index (BMI) residing in the Kağıthane district between November 2024 and December 2024. In studies where the population size exceeds 20,000 or is unknown, it is acceptable to assume a population size of 20,000<sup>9</sup>. Therefore, when calculating the sample size for this study, the population size was set at 20,000, and the sample was determined using the digital Raosoft Sample Size Calculator with 95% power and a 5% margin of error, resulting in a required sample size of 384 participants. The study was completed with a total of 396 participants.

Individuals with severe illnesses (such as heart disease or kidney failure), psychological disorders (such as eating disorders), those who have undergone surgical or medical interventions for weight loss in the past six months, nutrition and dietetics students or dietitians, individuals using medications that affect metabolic rate, and pregnant or lactating individuals were excluded from the study. Participants were administered the General Information Form, the Attitude Scale Toward Healthy Eating (ASHN), the Nutrition Knowledge Scale (NKS), and the Power of Food Scale (PFS). Data were collected through an online survey using Google Forms.

### ***General Information Form***

This form, prepared by the researchers, includes questions regarding participants' height, weight, gender, BMI, age, marital status, education level, occupation, income status, physical activity level, alcohol and smoking habits, presence of any illness requiring treatment in the past six months, dieting history, medication use, and family history of obesity. The anthropometric measurements collected from participants following standard methods were body weight and height<sup>10</sup>. Based on these data, BMI was calculated by the researchers using the formula  $[\text{body weight (kg)} / \text{height (m)}^2]$  and classified according to the World Health Organization (WHO) criteria<sup>11</sup>.

**Nutrition Knowledge Scale (NKS):** The Nutrition Knowledge Scale (NKS) was chosen as a validated, comprehensive measure of nutrition knowledge to enable standardized group comparisons and to examine its association with hedonic hunger and healthy eating attitudes. The NKS is a 5-point Likert-type scale, where participants rated each item on a scale from "Strongly Disagree" (0 points) to "Strongly Agree" (4 points). The maximum possible score on the scale is 126, with higher scores indicating a higher level of nutrition knowledge. A score of  $\leq 79$  is classified as "low knowledge level," a score between 90-100 as "moderate knowledge level," and a score of  $\geq 101$  as "high knowledge level"<sup>11,12</sup>.

**Power of Food Scale (PFS):** The Power of Food Scale (PFS) was used to quantify hedonic hunger and susceptibility to food cues using a validated Turkish instrument, aligning with the study's primary aim and hypotheses. The PFS, originally developed by Cappelleri et al.<sup>13</sup>, consists of 21 items in its original version. Following the Turkish validity and reliability study conducted by Ülker et al.<sup>14</sup>, the number of items was reduced to 15. The PFS is a 5-point Likert-type scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). It comprises three subdimensions: "Food Availability," "Food Presence," and "Food Tasting," with a total of 15 items. The scale is evaluated based on a 5-point scoring system, where an average score above 2.5 indicates the presence of hedonic hunger and susceptibility to food cues. As the total PFS score increases, the level of hedonic hunger also increases<sup>14</sup>.

**Attitude Scale for Healthy Nutrition (ASHN):** Standardized total and subdimension scores of healthy eating attitudes were obtained using the Attitude Scale for Healthy Nutrition (ASHN), facilitating group comparisons and correlation analyses with hedonic hunger and nutrition knowledge. This scale, developed by Demir and Cicioğlu<sup>15</sup> in 2019, is a valid and reliable measurement tool. It consists of four subdimensions and 21 items: Knowledge About Nutrition (BHB), Emotion Toward Nutrition (BYD), Positive Nutrition (OB), and Poor Nutrition (KB). Participants responded to the scale using a 5-point Likert-type format (1: Strongly Disagree, 5: Strongly Agree). The minimum possible score on the scale is 21, while the maximum is 105. A higher score indicates a more positive attitude toward healthy eating<sup>15</sup>.

### **Ethical Statement**

This study was reviewed and approved by the Istanbul Atlas University Non-Interventional Scientific Research Ethics Committee at its meeting dated 19 November 2024 (No: E-22686390-050.99-54955). Electronic informed consent was obtained from all participants.

### **Evaluation of Data**

The data were analyzed using the IBM SPSS v25.0 software package. The normality of data distribution was assessed using the Kolmogorov-Smirnov test. For group comparisons, the Independent Samples T-test was used for normally distributed data, while the Mann-Whitney U test was applied for non-normally distributed data. In

correlation analyses, Pearson correlation was used for normally distributed data, whereas Spearman correlation analysis was applied for non-normally distributed data. Statistical significance was set at  $p < 0.05$ .

## Results

In Table 1, the participants were evaluated in two groups: healthy individuals and obese individuals. Upon examining the gender distribution of the healthy individuals, it was determined that the proportion of women was 85.9% (170 individuals), while the proportion of men was 14.1% (28 individuals). According to marital status, 42.9% of healthy individuals are married, while 57.1% are single; among obese individuals, 31.8% are married and 68.2% are single. When examining the educational status of the participants, it was observed that 70.7% are university graduates, 15.7% have completed high school, 11.6% hold a master's degree, and 2% have an education at the primary school level. 42.4% of the participants reported being employed, while 57.6% indicated that they are not employed. In terms of income status, 24.2% of individuals have an income that exceeds their expenses, 24.7% have an income that is less than their expenses, and 51% have an income that is equal to their expenses. In obese individuals, the gender distribution was determined to be 78.8% female and 21.2% male. When examining the educational level, it was found that 76.8% are university graduates. With regard to income status, it was observed that 28.8% have an income that is less than their expenses. When assessing physical activity status, it was noted that 20.7% of healthy individuals reported not engaging in any physical activity, whereas this rate was 45.5% among obese individuals. In terms of alcohol consumption, 31.8% of healthy individuals reported using alcohol, compared to 12.6% of obese individuals. Additionally, smoking prevalence was reported at 30.3% for healthy individuals and 27.8% for obese individuals. The age ranges of participants were determined to be 14-69 years for healthy individuals and 19-62 years for obese individuals.

**Table 1.** General information about the participants

	Healthy Weight Individuals (BMI = 18.50-24.99 kg/m <sup>2</sup> )		Obese Individuals (BMI ≥30 kg/m <sup>2</sup> )	
	n	%	n	%
<b>Gender</b>				
Female	170	85.9	156	78.8
Male	28	14.1	42	21.2
<b>Marital Status</b>				
Married	85	42.9	63	31.8
Single	113	57.1	135	68.2
<b>Educational Status</b>				
Primary Education	4	2.0	11	5.6
High School	31	15.7	21	10.6
University	140	70.7	152	76.8
Postgraduate	23	11.6	14	7.1

<b>Occupation</b>				
Employed	84	42.4	41	20.7
Unemployed	114	57.6	157	79.3
<b>Income Status</b>				
Income Less Than Expenses	49	24.7	57	28.8
Income Equal to Expenses	101	51.0	81	40.9
Income Greater Than Expenses	48	24.2	60	30.3
<b>Physical Activity Status</b>				
None	41	20.7	90	45.5
1-2 Days a Week	98	49.5	77	38.9
3-4 Days a Week	50	25.3	25	12.6
5 or More Days a Week	9	4.5	6	3.0
<b>Alcohol Consumption</b>				
Yes	63	31.8	25	12.6
No	135	68.2	173	87.4
<b>Tobacco Consumption</b>				
Yes	60	30.3	55	27.8
No	138	69.7	143	72.2
	<b>Min.-Max.</b>	<b>X±SS</b>	<b>Min.-Max.</b>	<b>X±SS</b>
<b>Age (year)</b>	14-69	33.95±13.89	19-62	30.12±12.45

\* $\bar{X} \pm SS$ : Average  $\pm$  Standard Deviation, Min.-Maks.: Minimum – Maximum

In Table 2, participants are divided into two groups based on BMI: “Healthy Weight (18.5-24.99 kg/m<sup>2</sup>)” and “Obese (30.0 kg/m<sup>2</sup> and >30.0 kg/m<sup>2</sup>)”. According to the data categorized into groups, the total score of the Attitude Scale Toward Healthy Eating (ASHN) for obese individuals (65.07±12.90) is significantly lower than that of healthy individuals (76.22±10.18) (p<0.001). When examining the subdimensions of the Attitude Scale Toward Healthy Eating (ASHN), it was found that the scores of obese individuals in "Knowledge about Nutrition" (BHB) (19.92±2.73), "Emotions Related to Nutrition" (BYD) (14.91±6.12), "Positive Nutrition" (OB) (15.84±3.41), and "Poor Nutrition" (KB) (14.38±4.79) are significantly lower than the corresponding subdimension scores of healthy individuals (p<0.001). Additionally, it is observed that the total score of the Nutrition Knowledge Scale (NKS) and the total score of the Power of Food Scale (PFS) for obese individuals (116.48 ± 11.40 and 44.77 ± 6.82) show a significant difference compared to healthy individuals (121.45 ± 14.04 and 40.85 ± 10.5) (p<0.001). Among the subdimensions of PFS, the scores for "Food Accessibility" (BU) and "Food Availability" (BM) are higher in obese individuals, while there is no significant difference between the two groups regarding the score for "Food Tasting" (BTB) (p=0.424).

In conclusion, it has been determined that obese individuals exhibit differences in healthy eating attitudes and nutrition knowledge compared to healthy individuals, particularly showing lower values in positive nutrition and knowledge levels.

**Table 2.** Comparison of scale scores of healthy and obese participants

		Healthy Weight Individuals (BMI=18.50-24.99 kg/m <sup>2</sup> )		Obese Individuals (BMI ≥30 kg/m <sup>2</sup> )		p
		X±Ss	M(Q1-Q3)	X±Ss	M(Q1-Q3)	
<b>Total score of ASHN</b>		76.22±10.18	77.00 (70.00-84.00)	65.07±12.90	60.00 (55.00-75.00)	<0.001*
<b>ASHN Subdimensions</b>	<b>KB</b>	19.35±3.92	19.50 (18.00-23.00)	14.38±4.79	12.00 (10.00-19.00)	<0.001*
	<b>OB</b>	18.11±3.51	18.00 (16.00-21.00)	15.84±3.41	15.00 (13.00-18.00)	<0.001*
	<b>BHB</b>	21.06±2.85	21.00 (20.00-24.00)	19.92±2.73	20.00 (19.00-21.00)	<0.001*
	<b>BYD</b>	17.70±4.38	17.00 (15.00-21.00)	14.91±6.12	13.00 (12.00-17.25)	<0.001*
<b>Total score of NKS</b>		121.45±14.04	119.00 (111.00-131.00)	116.48±11.40	113.00 (111.00-122.00)	<0.001*
<b>Total score of PFS</b>		40.85±10.5	41.00 (34.00-48.00)	44.77±6.82	45.00 (42.00-47.00)	<0.001*
<b>PFS Subdimensions</b>	<b>BU</b>	11.46±4.04	11.00 (9.00-14.25)	12.98±2.77	13.00 (12.00-14.00)	<0.001*
	<b>BM</b>	12.55±3.58	13.00 (10.00-15.00)	14.60±2.59	15.00 (13.00-16.00)	<0.001*
	<b>BTB</b>	16.83±4.17	17.00 (14.75-20.00)	17.18±2.84	17.00 (16.75-18.00)	0.424

\* P<0.05, BHB: Knowledge about Nutrition, BYD: Emotions Related to Nutrition, OB: Positive Nutrition, KB: Poor Nutrition, BU: Food Accessibility, BM: Food Availability, BTB: Food Tasting

Table 3 presents the mean ( $\bar{x}$ ) and standard deviation (SD) values of PFS, ASHN, and their

subdimensions based on participants' hedonic hunger and BMI. The total ASHN score for healthy individuals with hedonic hunger was found to be 74.3±9.9, with subdimension scores of 18.6±3.9 for Poor Nutrition (KB), 17.9±3.5 for Positive Nutrition (OB), 21.03±2.8 for Knowledge About Nutrition (BHB), and 16.7±3.8 for Emotions Related to Nutrition (BYD). For healthy individuals without hedonic hunger, the total ASHN score was 83.7±9.9, with subdimension scores of 22.1±2.4 for KB, 18.7±3.1 for OB, 21.1±2.8 for BHB, and 21.6±4.05 for BYD. Among obese individuals with hedonic hunger, the total ASHN score was 63.8±11.9, with 13.9±4.5 for KB, 15.5±3.1 for OB, 19.8±2.6 for BHB, and 14.4±5.9 for BYD. For obese individuals without hedonic hunger, the total ASHN score was 85.8±11.5, with subdimension scores of 21.8±2.4 for KB, 20.3±4.0 for OB, 21.09±4.0 for BHB, and 22.5±4.03 for BYD. The total NKS score was

120.5±13.8 for healthy individuals with hedonic hunger, 125.3±14.2 for those without hedonic hunger, 116±11.2 for obese individuals with hedonic hunger, and 123.3±12.6 for obese individuals without hedonic hunger.

A significant relationship was found between ASHN total score, Poor Nutrition, and Emotions Related to Nutrition subdimensions in healthy individuals based on hedonic hunger ( $p < 0.01$ ), whereas no significant relationship was observed for NKS total scores ( $p > 0.05$ ). Among healthy individuals, participants with hedonic hunger had lower ASHN total scores, as well as lower Poor Nutrition and Emotions Related to Nutrition subdimension scores compared to those without hedonic hunger. In obese individuals, a significant relationship was found between ASHN total score, Poor Nutrition, Positive Nutrition, and Emotions Related to Nutrition subdimensions based on hedonic hunger ( $p < 0.001$ ). Additionally, a significant relationship was observed between the Knowledge About Nutrition subdimension and NKS total score in obese individuals with hedonic hunger ( $p < 0.05$ ).

**Table 3.** Comparison of NKS, ASHN Total score, and subdimensions based on participants' hedonic hunger and BMI

		Healthy Weight (BMI=18.50-24.99 kg/m <sup>2</sup> )					Obese Individuals (BMI ≥30 kg/ m <sup>2</sup> )				
		Participants with Hedonic Hunger		Participants without Hedonic Hunger			Participants with Hedonic Hunger		Participants without Hedonic Hunger		
		M (Q1-Q3)	X±Ss	M (Q1-Q3)	X±Ss	p	M (Q1-Q3)	X±Ss	M (Q1-Q3)	X±Ss	p
ASHN		74 (67-82)	74.3±9.9	84 (78-89)	83.7±9.9	<0.001*	59 (55-72)	63.8±11.9	91 (79-92)	85.8±11.5	<0.001*
ASHN Subtotal	KB	19 (16-22)	18.6±3.9	23 (20-24)	22.1±2.4	<0.001*	12 (10-18)	13.9±4.5	22 (20-24)	21.8±2.4	<0.001*
	OB	18 (16-22)	17.9±3.5	19 (17-21)	18.7±3.1	0.1	15 (13-17)	15.5±3.1	21 (18-24)	20.3±4.0	<0.001*
	BHB	21 (20-24)	21.03±2.8	21 (20-24)	21.1±2.8	0.5	20 (19-21)	19.8±2.6	22 (20-25)	21.09±4.1	0.026
	BYD	16 (14-19)	16.7±3.8	22 (19-25)	21.6±4.05	<0.001*	13 (11-16)	14.4±5.9	23 (20-25)	22.5±4.03	<0.001*
Nutrition Knowledge Scale		118 (111-129)	120.5±13.8	121 (115-139)	125.3±14.2	0.076	112 (110-119)	116±11.2	129 (114-129)	123.3±12.6	0.008

\* $p < 0.05$  M(Q1-Q3): Median (25th quartile -75th quartile), x±SD: Mean±Standard deviation, Emotion Towards Nutrition(BYD) Knowledge about Nutrition (BHB), Emotion Towards Nutrition (BYD), Positive Nutrition (OB), Malnutrition (KB)

In Table 4, a moderate positive correlation ( $r=0.675$ ) was found between the ASHN Total Score and the NKS Total Score, and this correlation was statistically significant ( $p=0.000$ ).

Additionally, a high positive correlation ( $r=0.73$ ) was observed between the ASHN Total Score and the PFS Total Score, and this correlation was also significant ( $p=0.000$ ). A very strong positive correlation ( $r=0.823$ ) was determined between the ASHN Total Score and the PFS Subdimensions (BU), and this correlation was also statistically significant ( $p=0.000$ ).

Finally, a perfect linear relationship ( $r=1$ ) was found between the PFS Subdimensions (BU) and the PFS Subdimensions (BM), indicating that these two dimensions fully support each other. A strong positive correlation ( $r=0.693$ ) was found between the PFS Subdimensions (BU) and the PFS Subdimensions (BTB), and this correlation was statistically significant ( $p=0.000$ ). Additionally, a strong positive correlation ( $r=0.377$ ) was observed between the PFS Subdimensions (BM) and the PFS Subdimensions (BTB), and this correlation was also statistically significant ( $p<0.0001$ ).

**Table 4.** Correlation table

	NKS Total Score		PFS Total Score		PFS Sub-Dimensions							
	r	p	r	p	BU		BM		BTB			
					r	p	r	p	r	p		
<b>ASHN Total Score</b>	0.675**	-	0.73	-	0.823**	<0.0001	0.86	<0.0001	0.452	<0.0001		
<b>ASHN Sub Dimensions</b>	<b>BHB</b>	-	<0.0001	0.23	0.001	0.35	<0.0001	0.377**	<0.0001	-	<0.0001	
	<b>OB</b>	-	0.730	-	0.001	-	0.312	-0.146	0.041	0.102	0.153	
	<b>KB</b>	0.091	0.200	-	0.201**	0.001	-	<0.0001	-0.066	0.358	0.100	0.160
	<b>BYD</b>	0.006	0.929	-	0.315**	0.001	-0.14	0.041	-0.171*	0.016	0.187**	0.008
<b>NKS Total Score</b>	0.347**	0.001	0.535	0.001	0.477**	<0.0001	0.486*	<0.0001	0.675**	<0.0001		
<b>PFS Total Score</b>	0.347**	<0.0001	0.513*	0.001	0.550**	<0.0001*	0.239	0.001	0.735**	<0.0001		
<b>PFS Sub-Dimensions</b>	<b>BU</b>	0.535**	0.001	0.513**	0.000	1	<0.0001*	0.693**	0.001	0.353**	<0.0001	
	<b>BM</b>	0.477	0.001	0.550**	0.000	0.693**	<0.0001*	1.000	<0.0001	0.377**	<0.0001	
	<b>BTB</b>	0.4	0.001	0.239**	0.001	-	<0.000	0.452**	0.001	1.000	<0.0001	

\* $P<0.05$ , $r$ :correlation coefficient, BHB: Knowledge about Nutrition, BYD: Emotions towards Nutrition Knowledge about Nutrition (BHB), Emotions towards Nutrition (BYD), Positive Nutrition (OB), Malnutrition (KB), Food Accessibility (BU), Food Availability (BM), Food Tasting (BTB)

## Discussion

In this study, when the attitudes toward healthy eating, nutrition knowledge levels, and hedonic hunger status of healthy and obese individuals were compared, significant differences were observed between the groups (Table 2). The finding that obese individuals had lower total scores on the ASHN compared to healthy individuals suggests that attitudes toward healthy eating may be weaker in obese individuals. The fact that this pattern was also evident across the ASHN subdimensions (knowledge, emotion, positive eating, and unhealthy eating) indicates that healthy eating attitudes in obese individuals may be concurrently affected at cognitive, emotional, and behavioral levels. Indeed, the literature reports that eating behaviors in obese individuals are not solely driven by physiological hunger but represent a multidimensional structure influenced by reward sensitivity, uncontrolled eating, and environmental factors<sup>16,17</sup>.

Regarding the relationship between hedonic hunger and obesity, hedonic hunger has been associated with an increased desire for energy-dense, high-calorie foods and higher energy intake, which may contribute to obesity risk<sup>17,18</sup>. Increased reward sensitivity to food can trigger eating behavior independently of physiological hunger, a mechanism that particularly reinforces patterns of uncontrolled eating in obese individuals. Consistently, studies using the PFS have shown that greater sensitivity to food cues is associated with uncontrolled eating behaviors<sup>16,19</sup>. In the present study, obese individuals had higher PFS scores than healthy individuals, suggesting that hedonic hunger may be more pronounced in the obese group (Table 2).

In our study, obese individuals had lower total NKS scores than healthy individuals (Table 2). This finding suggests that nutrition knowledge may be more limited among obese individuals; however, it should be interpreted in light of evidence indicating that knowledge does not always translate into healthy eating behavior. When hedonic hunger is prominent, individuals may have difficulty applying their nutrition knowledge to their dietary practices<sup>16,20</sup>.

Considering Tables 3 and 4 together, obese individuals with hedonic hunger appear to have markedly lower levels of both nutrition knowledge and healthy eating attitudes. In this group, lower ASHN total scores and reduced scores in the relevant subdimensions (KB, OB, and BYD) suggest that hedonic hunger may be associated not only with poorer eating-related patterns but also with a less favorable overall profile of healthy eating attitudes. Consistent with the literature, hedonic hunger has been reported to be significantly associated with obesity status independent of BMI and may particularly compromise the regulation of eating behavior among individuals with obesity<sup>3</sup>.

The lower nutrition knowledge observed in the same group provides additional support for the possibility that hedonic hunger may hinder the translation of nutrition knowledge into healthier eating practices among individuals with obesity. Indeed, the correlations presented in Table 4 indicate significant relationships between the PFS and its subdimensions and ASHN, while the ASHN total score was positively associated with the NKS. These findings support the notion that hedonic hunger reduces healthy eating attitudes by increasing reward-driven eating behaviors. Furthermore, previous research has shown that hedonic hunger is strongly associated with compulsive eating, intense food cravings, and food addiction, with these mechanisms being more pronounced in obese individuals<sup>16</sup>. Additionally, hedonic hunger has been linked to lower self-esteem and weight-related self-stigmatization in obese individuals, psychosocial processes that may further reduce motivation for healthy eating behaviors<sup>19</sup>. Evidence from structured weight management programs demonstrates that improvements in weight control behaviors are associated with reductions in hedonic hunger, highlighting its critical role in obesity management<sup>17</sup>. Similarly, studies in adolescent populations have shown that hedonic hunger negatively affects obesity-related quality of life outcomes<sup>21</sup>.

## Conclusion

This study compared hedonic hunger, attitudes toward healthy eating, and nutrition knowledge between obese and healthy individuals. The findings demonstrated that obese individuals had significantly lower attitudes toward healthy eating and lower nutrition knowledge levels than healthy individuals. Hedonic hunger levels were higher in obese individuals and were negatively associated with all subdimensions of healthy eating attitudes, including poor nutrition, positive nutrition, emotions related to nutrition, and nutrition knowledge. In healthy individuals, hedonic hunger was primarily associated with poor nutrition and emotions related to nutrition, while no significant association was observed with nutrition knowledge. Collectively, these results suggest that nutrition knowledge alone may be insufficient to promote healthy eating behaviors in individuals with obesity and that hedonic hunger may constitute a major barrier in translating knowledge into practice.

Accordingly, obesity prevention and management strategies should extend beyond traditional nutrition education and include targeted approaches to regulate hedonic hunger and reward-driven eating. In clinical and community settings, routine screening for hedonic hunger (e.g., using the PFS) may help identify individuals who are more susceptible to food cues, and integrating cue-management strategies, cognitive-behavioral techniques, and mindfulness-based components into counseling may improve adherence to healthy eating patterns. At the policy level, improving access to healthy foods and reducing exposure to energy-dense, highly palatable foods—through measures such as clear front-of-pack labeling, healthier food environments, and restrictions on marketing, particularly in digital settings—may support healthier choices at the population level. Finally, longitudinal and intervention studies are warranted to clarify the directionality of these associations and to evaluate the effectiveness of hedonic hunger-focused interventions in obesity management.

## Limitations

This study has several limitations that should be considered when interpreting the findings. First, due to its cross-sectional design, causal relationships cannot be established, and the results are not intended to be generalized to the overall population. The sample was drawn from a specific region and consisted predominantly of women and individuals with a university-level education, which may further limit generalizability.

Second, the study relied on self-reported data, including height and body weight, which may be subject to reporting bias and measurement inaccuracies. However, this approach is commonly used in large-scale and online-based observational studies.

Third, although the measurement tools used in the study have demonstrated acceptable validity and reliability, cultural factors may have influenced the assessment of certain attitudes and behaviors. In addition, detailed information regarding participants'

underlying health conditions could not be fully obtained, which may have limited the evaluation of potential health-related factors contributing to obesity.

Finally, the lack of longitudinal follow-up prevented the assessment of changes in hedonic hunger, eating attitudes, and nutrition knowledge over time. Future studies incorporating more diverse samples, objective anthropometric measurements, and longitudinal designs are recommended to further validate and extend the present findings.

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