

# Research Article

# The Relationship of Hedonic Hunger and Night-Eating Symptoms with Difficulties in Emotion Regulation in Young Adults

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*Purpose*. This study aimed to examine the association between hedonic hunger and night-eating syndrome (NES) with difficulties in emotion regulation (DER) among young adults. *Design and Methods*. This cross-sectional, descriptive study was conducted on a voluntary basis at a private foundation university, involving a total of 1010 students enrolled in the 2020-2021 academic year. Data were collected through an online application of an information form, which assessed demographic characteristics, the Power of Food Scale (PFS), the Night-Eating Questionnaire (NEQ), and the Difficulties in Emotion Regulation Scale-Short Form (DERS-16). The data were analyzed using IBM SPSS26® software. *Findings*. Women made up 80.4% of the students in the study. The mean age was  $21.58 \pm 2.98$  years, and the mean body mass index (BMI) was  $22.06 \pm 3.71$  kg/m<sup>2</sup>. The results indicated that 68.1% of the students reported hedonic hunger and 88.7% had NES. Moreover, DER was found to be more prevalent among women (p = 0.031). In addition, the DERS-16 score increased by 6.5% (p = 0.040) with each increase in age and by 6.8% (p = 0.031) with each increase in BMI. Furthermore, the total PFS score increased by 32.5% (p < 0.001), and the total NEQ score increased by 22.4% (p < 0.001), corresponding to an increase in the total DERS-16 score. *Practice Implications*. These findings suggest that an increase in the difficulties experienced in emotion regulation is associated with higher levels of hedonic hunger and night-eating tendencies among young adults.

## 1. Introduction

People have historically sought food to maintain energy homeostasis and ensure survival, thereby preventing hunger [1]. However, with the global rise in obesity rates, it has become apparent that food consumption is influenced not only by energy requirements but also by the pleasurable aspects of eating [2]. This distinction underscores the existence of two distinct forms of hunger such as homeostatic and hedonic. Homeostatic hunger refers to the physiological control of food intake triggered by a decrease in blood glucose and an increase in free fatty acids. It typically arises after a minimum of 8 hours of nutrient deprivation and is independent of the sensory appeal of food [3]. Conversely, hedonic hunger refers to the desire and impulse to eat for pleasure, unrelated to physiological hunger or calorie needs [1]. Hedonic hunger is influenced by various factors, including individual differences such as age, gender, menstrual cycle, dietary patterns, and responsiveness to food cues. It is also impacted by heightened food cravings, impulsivity, self-perception, and personal experiences. The sensory characteristics of food, such as taste, color, aroma, texture, and even auditory cues, play a significant role in regulating food intake [4]. However, excessive consumption of palatable, high-fat, and highsugar foods resulting from hedonic hunger increases the risk of various diseases, including eating disorders, obesity, hypertension, diabetes mellitus, cardiovascular diseases, nonalcoholic fatty liver disease, obstructive sleep apnea, and certain types of cancer [5]. Eating disorders are mental disorders that involve harmful behaviors related to eating, significantly impacting individuals' physical and mental well-being [6]. These disorders are a significant public health issue and are prevalent worldwide [7]. Night-eating syndrome (NES), categorized as an eating disorder, is characterized by delayed circadian food consumption, binge eating during late-night hours, sleep disturbances, evening mood swings, and other associated symptoms [8].

Emotions hold great importance in human life and are complex systems that have evolved to prepare organisms for environmental stimuli and challenges [9]. Various internal and external stimuli trigger emotional responses in daily life, and these emotions manifest through physiological, mental, and behavioral reactions [10]. Emotion regulation is the process of amplifying, dampening, or maintaining experienced emotions. Through emotion regulation, individuals can express and manage their feelings in a controlled manner [11].

When individuals struggle to cope with and regulate their emotions, the concept of difficulties in emotion regulation (DER) comes into play. This condition is characterized by a lack of emotional awareness, difficulty in understanding emotions, being overwhelmed by impulses during negative emotional experiences, and struggling to take goal-oriented actions [12]. Research suggests that disordered eating behaviors may either impair emotional awareness or foster avoidance of emotions [13]. This lack of emotional awareness, acceptance, and coping skills is considered one of the factors perpetuating eating disorders [14, 15]. Cross-sectional studies in the literature consistently demonstrate relationships between dimensions of emotion dysregulation and eating disorder symptoms and syndromes [16, 17]. Moreover, deficits in emotion regulation skills are emphasized in the apparent risk [18] and maintenance [19] models of eating disorders.

It is believed that DER plays a role in the development and maintenance of eating disorders. Therefore, understanding the association between hedonic hunger and NES with DER is essential for comprehending the etiology, maintenance, and consequences of eating disorders. However, there is a lack of research on this topic. This study aimed to fill this gap by examining the relationship between hedonic hunger and night-eating conditions of university students with DER.

#### 2. Methods

2.1. Participants and Procedures. This cross-sectional, descriptive study included a population of 21,000 university students who were registered at a private foundation university during the 2020-2021 academic years. The sample for the study was obtained using a simple random sampling method. The sample size was determined using a formula based on the specified population, and it was calculated that 378 students from the study population would be sufficient for the study, considering a 95% confidence level and a 5% margin of error (*z*-score: 1.96). The sample comprised 1010 students who were reached through simple random sampling, participated voluntarily, and completed all data collection tools. The study received approval from the Ethics Committee (Ethics Committee approval number: 61351342/2021-68, dated 29/01/2021) at Uskudar University's Non-interventional Research Ethics Committee. The participants were informed about the purpose and scope of the study, and their "voluntary consent for participation" was obtained. This research was conducted in accordance with the principles outlined in the Helsinki Declaration and adhered to the guidelines of research and publication ethics.

Data collection was conducted via an online survey application of an information form, which questions demographic characteristics (age, gender, anthropometric measurements, exercise status, and so on), the Power of Food Scale (PFS), the Night-Eating Questionnaire (NEQ), and the Difficulties in Emotion Regulation Scale-Short Form (DERS-16) via Google Forms between March and May 2021 due to the COVID-19 pandemic.

#### 2.2. Measures

2.2.1. Power of Food Scale (PFS). The PFS was developed by Cappelleri et al. in 2009 as a tool to assess individuals' emotions, thoughts, and desires regarding food and nutrition in environments where appetizing foods are abundant, regardless of physiological needs. This scale employs a fivepoint Likert-type format, with response options ranging from 1 (strongly disagree) to 5 (strongly agree). It consists of five items and includes three subfactors (food available, food present, and food tasted) that measure individuals' responses to the proximity of food. Total scores of 2.5 points or higher on the scale indicate the presence of hedonic hunger, and higher scores on the scale suggest increased motivation to consume appetizing foods in the environment. Mehtap and Melisa et al. [20] conducted a validity and reliability study of the scale in Turkish and calculated Cronbach's alpha coefficient value of 0.85. In the present study, Cronbach's alpha coefficient for the PFS was calculated to be 0.93.

2.2.2. Night-Eating Questionnaire (NEQ). The NEQ was developed by Allison et al. in 2008 to assess the severity of night-eating syndrome (NES). It consists of the following four subscales: evening hyperphagia, morning anorexia, mood/sleep, and nocturnal ingestion. Questions 1-9 are answered by all participants, while questions 10-12 are specific to individuals who wake up at night, and questions 13 and 14 are applicable to those who have night snacks. All items in the NEQ are scored on a five-point Likert scale. Only the 7th question addresses mood changes, and individuals who do not experience any changes receive 0 points. Reverse coding is applied to questions 1, 4, and 14. Questions 13, 14, and 15 are not included in the scoring process. The scoring range for diagnosing NES is 0–52, with a cutoff score of 25 points or higher indicating the presence of NES. Atasoy et al. [21] conducted a validity and reliability study of the NEQ in Turkish, reporting Cronbach's alpha coefficient of 0.69. In the present study, Cronbach's alpha coefficient for the NEQ was calculated to be 0.68.

2.2.3. Difficulties in Emotion Regulation Scale-Short Form (DERS-16). The DERS was originally developed by Gratz and Roemer in 2004 to measure individuals' levels of difficulties in emotion regulation (DER). The short form of the scale, known as DERS-16, was later developed by Bjureberg et al. in 2016. It consists of five subscales, namely, clarity, impulse, goals, strategy, and nonacceptance. Participants rate their responses to each item on a 16-item Likert-type scale with five response options, ranging from 1 (almost never) to 5 (almost always). No specific cutoff point has been established for evaluating scale scores. Generally, higher scores on the DERS-16 indicate greater difficulties in emotion regulation. The validity and reliability of the scale in the Turkish language were established by Yiğit and Guzey Yiğit in 2017, who reported Cronbach's alpha coefficient of 0.92 [22]. In the present study, the overall Cronbach's alpha coefficient for the DERS-16 was calculated to be 0.94.

2.3. Statistical Analysis. Descriptive statistics for categorical variables (demographic characteristics) were presented as frequency and percentage. The Shapiro-Wilk test was used to assess the normal distribution of the data. Since the data were normally distributed, mean (±standard deviation) values were used. The Levene test was employed to assess the homogeneity of group variances. The independent sample Ttest was used to compare two independent groups when the data met the assumptions of parametric tests. For comparisons of more than two independent groups, the one-way ANOVA test was utilized if the data met the assumptions of parametric tests and homogeneity tests. Alternatively, the Welch ANOVA test was used. To determine the differences between groups after the one-way ANOVA test, the Tukey-HSD multiple comparison test was employed. For the Welch ANOVA test, the Tamhane multiple comparison test was used. The results of the multiple comparison tests were denoted by letters next to the means. The Pearson productmoment correlation coefficient was utilized to examine the relationships between the scales. The interpretation of the correlation coefficient was based on the following criteria: "less than 0.2: very weak," "0.2-0.4: weak," "0.4-0.6: medium," "0.6-0.8: strong," and "greater than 0.8: very strong" correlation degree. Cronbach's alpha coefficient was calculated to determine the reliability level of the scales studied. The statistical significance level was considered as " $\alpha < 0.05$ ,  $\alpha < 0.01$ , and  $\alpha < 0.001$ " in all calculations and interpretations, and hypotheses were established as bidirectional. Data analysis was performed using SPSS v26 (IBM Inc., Chicago, IL, USA).

#### 3. Results

Women constituted 80.4% of the study participants, with a mean age of  $21.58 \pm 2.98$  years and a mean body mass index (BMI) of  $22.06 \pm 3.71$  kg/m<sup>2</sup>. Among the participants, 68.0% fell within the normal weight range according to BMI categories. It was observed that 15% of the participants had received a medical diagnosis from a healthcare professional, with sexual disease (2.7%) and insulin resistance (2.6%) being the most prevalent conditions. In addition, 70.3% of the students reported engaging in moderate-intensity physical activity for at least 150 minutes per week or more, as recommended by the World Health Organization (WHO) [23]. Surprisingly, 50.3% of these individuals still expressed dissatisfaction with their level of physical activity. Furthermore, the average daily sleep duration for 55.5% of the students fell within the range of 6–8 hours (Table 1).

The PFS assessment revealed that 68.1% of the students had hedonic hunger, and the NEQ assessment showed that 11.3% had NES. The mean score of the DERS-16 students was  $39.86 \pm 14.37$  points (Table 2).

In the PSF among the students, it was observed that women had a significantly higher mean score compared to men (p < 0.001). Similarly, overweight and obese participants had significantly higher mean scores compared to underweight individuals based on BMI (p < 0.001). Furthermore, students who did not engage in regular exercise had higher mean scores compared to those who did exercise (p = 0.016). Moreover, a statistically significant negative correlation was found between the age of the students and their total PFS scores although the correlation was very weak (r = -0.083; p < 0.009). This suggests that as the age of the students increases, there is an 8.3% decrease in their total PFS scores. In addition, a statistically significant positive correlation was observed between BMI and the total PFS scores of the participants, albeit with a very weak strength (r = 0.176; p < 0.001). This indicates that as the BMI of the students increases, there is a 17.6% increase in their total PFS scores (Table 3).

The findings from the assessment of the NEQ revealed that students who did not engage in regular exercise had a significantly higher mean score compared to those who did exercise (p = 0.007). Furthermore, students with a daily sleep duration of less than 4 hours had a significantly higher mean score compared to those with a daily sleep duration of 6–8 hours (p = 0.006). In addition, a statistically significant positive correlation was observed between the students' BMI and their total NEQ scores although the correlation was very weak (r = 0.079; p = 0.012). This suggests that as the BMI of the students increases, their total NEQ scores increase by 7.9% (Table 3).

The DERS-16 assessment revealed that the mean score of women was statistically significantly higher than that of men (p = 0.031) among the students. Furthermore, students with a daily sleep duration of more than 8 hours had a significantly higher mean score compared to students with a daily sleep duration between 6 and 8 hours (p < 0.001). Regarding the correlation analysis, a significant negative correlation was observed between the age of the students and their total DERS-16 scores although the correlation was very weak (r = -0.065; p < 0.040). This indicates that as the age of the students increases, there is a 6.5% decrease in their total DERS-16 scores. In addition, a significant positive correlation, albeit very weak, was found between the BMI of the students and their total DERS-16 scores (r = 0.068; p = 0.031). This suggests that as the BMI of the students increases, there is a 6.8% increase in their total DERS-16 scores (Table 3).

TABLE 1: Demographic characteristics of students.

	Ν	%
Gender		
Female	812	80.4
Male	198	19.6
Age $(\overline{X} \pm SD)$	$21.58 \pm 2.98$	
BMI $(\overline{X} \pm SD)$	$22.06 \pm 3.71$	
Underweight (<18.5 kg/m <sup>2</sup> )	141	14.0
Normal weight (<18.5–24.9 kg/m <sup>2</sup> )	687	68.0
Overweight and obese $(\geq 25.0 \text{ kg/m}^2)$	182	18.0
Disease diagnosis made by the doctor		
Yes	152	15.0
No	858	85.0
Physical activity ≥150 minute/week		
Yes	710	70.3
No	300	29.7
Thinking that you are doing enough physical	activity	
Yes	275	27.2
No	508	50.3
Not sure	227	22.5
Daily sleep duration		
<4 hours	13	1.3
4–6 hours	117	11.6
6–8 hours	561	55.5
>8 hours	319	31.6

BMI: Body Mass Index.

TABLE 2: The scores of PSF, NEQ, and DERS-16 scales of students.

	N	%	
Total PSF score $(\overline{X} \pm SD)$	tal PSF score ( $\overline{X} \pm SD$ ) 2.91 ± 0.94		
Food available $(\overline{X} \pm SD)$	Food available $(\overline{X} \pm SD)$ 1.06 ± 0.4		
Food present $(\overline{X} \pm SD)$	$0.82 \pm 0.29$		
Food tasted $(\overline{X} \pm SD)$	$1.03\pm0.34$		
PSF hedonic hunger			
There is hedonic hunger	688	68.1	
There is no hedonic hunger	322	31.9	
Total NEQ score $(\overline{X} \pm SD)$	$17.15 \pm 6.13$		
Nocturnal ingestions	2.47 ±	$2.47 \pm 4.08$	
Evening hyperphagia	3.48 ±	$3.48 \pm 1.68$	
Morning anorexia	$7.74 \pm 2.70$		
Mood/sleep	$3.46 \pm 1.91$		
NEQ night-eating syndrome			
There is night-eating syndrome	114	11.3	
There is no night-eating syndrome	896	88.7	
Total DERS-16 score $(\overline{X} \pm SD)$	$39.86 \pm 14.37$		
Clarity	$4.81 \pm 2.05$		
Goals	9.22 ±	3.36	
Impulse	$6.87 \pm 3.20$		
Strategies	$12.30\pm5.23$		
Nonacceptance	6.66±	3.26	

PSF: Power of Food Scale; NEQ: Night-Eating Questionnaire; DERS-16: Difficulties in Emotion Regulation Scale-Short Form.

The analysis of the data collection tools revealed significant positive weak correlations between the total DERS-16 scores of the students and both the total PSF score (r = 0.325, p < 0.001) and the total NEQ score (r = 0.224, p < 0.001). This indicates that as the total DERS-16 score of the students increases, there is a 32.5% increase in the total PSF scores and a 22.4% increase in the total NEQ scores (Table 4).

#### 4. Discussion

This study aimed to investigate the relationship among hedonic hunger, NEQ (Night-Eating Questionnaire), and DER (difficulties in emotion regulation) in university students. The findings of the study suggest that there is a positive association between the level of difficulty experienced in emotion regulation and both hedonic hunger and night-eating tendencies. In other words, as participants faced more challenges in regulating their emotions, they also exhibited higher levels of hedonic hunger and a greater tendency to engage in night-eating behaviors.

The sample of the study consisted of 1010 participants; approximately 4 out of every 5 participants were women. According to the WHO recommendations [23], approximately 7 out of every 10 participants engaged in moderate-intensity physical activity for 150 minutes or more per week and more than half of them had a mean daily sleep duration of 6–8 hours. It was found that approximately 9 out of every 10 students had night-eating syndrome, according to the NES assessment, and 7 out of every 10 students had hedonic hunger.

Among university students, it was found that women exhibit higher levels of DER compared to men. This difficulty is characterized by challenges in understanding and accepting their emotions, controlling impulsive behaviors, setting goals, and developing effective strategies to achieve those goals. The existing literature study presents mixed findings regarding gender differences in DER. Some studies suggest that women tend to experience higher levels of DER [24, 25], while others argue that gender does not play a significant role in this regard [26, 27]. For instance, Ayseli's study reported that women encounter more difficulty in maintaining focus during stressful situations, whereas men struggle more with identifying and expressing their emotions [28]. Furthermore, women commonly employ an emotion-oriented coping strategy when they perceive the stressor as unchangeable and must be endured. This strategy involves focusing on the emotional aspects of the stressor rather than actively seeking to solve the problem. Conversely, men tend to adopt a problem-oriented coping strategy, which aims to address and resolve the source of stress [29]. These gender differences in coping strategies may contribute to the observed variations in DER among women. In summary, it is evident that women tend to experience higher levels of DER compared to men in the context of university students. The differences in DER may be influenced by various factors, including coping strategies employed during stressful situations.

This study discovered a significant negative correlation, with a 6.5% decrease in DERS-16 scores as age increased. Studies in the literature have shown that DER tends to decrease with age [30, 31] while others have suggested that age is not a distinguishing factor in emotion regulation [32, 33]. The observed decrease in DER scores with age could potentially be attributed to increased life experience and maturity, which contribute to better emotional control. Furthermore, a 6.8% increase in DERS-16 scores was observed as BMI increased. This finding aligns with existing

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	Total	Total	Total
	PSF score $(\overline{X} \pm SS)$	NEQ score ( $\overline{X} \pm SS$ )	DERS-16 score ( $\overline{X} \pm SS$ )
Gender			
Female	$2.98\pm0.91$	$17.25 \pm 6.06$	$40.34 \pm 14.47$
Male	$2.61 \pm 0.97$	$16.71 \pm 6.41$	$37.88 \pm 13.81$
	t = 4.940	t = 1.110	t = 2.167
	p < 0.001	p = 0.267	p = 0.031
Age $(\overline{X} \pm SS)$	r = -0.083	r = -0.028	r = -0.065
	p = 0.009	p = 0.374	p = 0.040
$\mathbf{DMI}(\overline{\mathbf{V}} + \mathbf{SS})$	r = 0.176	r = 0.079	r = 0.068
$BMI (X \pm 33)$	p < 0.001	p = 0.012	p = 0.031
Disease diagnosis made by the	he doctor		
Yes	$2.95 \pm 0.95$	$17.78 \pm 6.42$	$41.49 \pm 15.58$
No	$2.90 \pm 0.94$	$17.03 \pm 6.08$	$39.57 \pm 14.14$
	t = 0.590	<i>t</i> = 1.391	t = 1.522
	p = 0.555	p = 0.164	p = 0.128
Physical activity $\geq 150$ minut	e/week		
Yes	$2.86 \pm 0.94$	$16.78 \pm 5.77$	$39.29 \pm 14.21$
No	$3.02 \pm 0.91$	$18.01 \pm 6.85$	$41.22 \pm 14.69$
	t = -2.412	t = -2.727	t = -1.954
	p = 0.016	p = 0.007	p = 0.051
Daily sleep duration			
<4 hours	$3.27 \pm 1.13$	$22.69^{b} \pm 7.95$	$40.15^{ab} \pm 18.68$
4-6 hours	$2.87\pm0.88$	$18.34^{ab} \pm 5.97$	$38.81^{ab} \pm 13.91$
6–8 hours	$2.93 \pm 0.81$	$16.70^{a} \pm 5.80$	$38.36^{a} \pm 14.40$
>8 hours	$2.87 \pm 0.99$	$17.26^{ab} \pm 6.51$	$42.86^{\text{b}} \pm 13.89$
	F = 0.909	W = 4.648	W = 6.998
	<i>p</i> = 0.436	<b>p</b> = 0.006	p < 0.001

PFS: Power of Food Scale, NEQ: Night-Eating Questionnaire, DERS-16: Difficulties in Emotion Regulation Scale-Short Form, *t*: Independent Sample *T*-Test, *r*: Pearson product-moment correlation, and W: Welch ANOVA test; different letters indicate statistically significant differences (p < 0.05, p < 0.01, and p < 0.001).

TABLE 4: Correlation coefficient between the scales.

		Total PSF	Total NEQ	Total DERS-16
Total PSF	r	1		
	P			
Total NEQ	r	0.320	1	
	р	<0.001		
Total DERS-16	r	0.325	0.224	1
	P	<0.001	<0.001	

PFS: Power of Food Scale, NEQ: Night-Eating Questionnaire, DERS-16: Difficulties in Emotion Regulation Scale-Short Form, and r: Pearson Product-Moment Correlation. Statistical significance level was considered as p < 0.001.

literature indicating that individuals with obesity tend to exhibit higher levels of DER [34, 35]. For instance, a study by Lazarevich et al. involving 1453 university students revealed an association between emotional eating, BMI, and the importance of emotion regulation for maintaining health in young adults [36]. Conversely, a study conducted by Monell et al. involving 999 individuals with eating disorders and 252 control subjects found no significant relationship between emotion regulation and BMI [37]. Another study by Solak Uvar, which focused on 537 female university students aged 18-25, reported no significant differences in DER based on BMI. However, individuals with higher BMI displayed a greater tendency to have negative emotions and engage in emotional eating [38]. These findings suggest that DER, influenced by negative emotions and conditions such as anxiety about the future, socioeconomic issues, and academic success anxiety in university students, may serve as a risk factor for obesity and obesity-related health problems, particularly among individuals prone to emotional eating.

According to the WHO recommendations, students who reported not engaging in at least 150 minutes of physical activity per week exhibited borderline high DERS-16 scores (p = 0.051) although this difference was not statistically significant compared to those who did meet the recommended activity level. While limited research exists on the direct relationship between exercise duration and DER, studies have explored how exercise or sports impact emotional states. For instance, a study involving 704 young adults found a significant positive correlation between the frequency of moderate/vigorous physical activity and happiness, as well as a negative correlation with anxiety/fear, sadness, and anger [39]. Other studies in the literature have demonstrated a positive linear relationship between regular physical activity and positive moods [40–42]. Moreover, exercise during the COVID-19 pandemic has been reported to reduce negative mood states such as depression, anxiety [43, 44], and stress [45]. This can be explained by the fact that physical activity and exercise enhance problem-solving abilities, contribute to a positive emotional state, and increase an individual's sense of self-worth, as highlighted in Aylaz et al.'s study. Consequently, physical activity can aid in coping with negative emotions and depressive symptoms by improving psychological resilience and emotion regulation skills [46].

The recommended duration of healthy sleep for optimal mental and physical health typically falls within the range of 6–8 hours although this can vary depending on factors such as age, gender, physical activity level, nutrition, overall health, and environmental conditions [47, 48]. In the current study, it was observed that students who reported having a daily sleep duration of more than 8 hours exhibited higher levels of DER compared to those with a sleep duration of 6–8 hours. While there is a lack of research specifically investigating the relationship between sleep duration and DER, existing literature has shown associations between DERS scores and indicators of poor sleep quality [49] and insomnia-related difficulties [50].

The studies mentioned have highlighted that DER can be a contributing risk factor for sleep-related psychiatric conditions, including mood and anxiety disorders. The sleep-wake cycle is considered the most crucial and influential circadian rhythm in humans. Disruption of this rhythm can lead to functional impairment in various areas of life, such as social, occupational, academic, and overall mental and physical well-being [51]. Prolonged sleep duration, along with negative mood and a tendency to avoid coping with problems, may serve as indicators of difficulties individuals face in regulating their emotions. These difficulties, in turn, can impact sleep patterns and contribute to the development or exacerbation of mental health issues.

The findings of this study revealed a significant increase in hedonic hunger tendency by 32.5% and nighteating tendency by 22.4% as DER levels increased. While there are no specific studies examining the direct relationship between DER and NES, research exploring the connection between eating attitudes/disorders and emotion regulation has been investigated. Previous studies have consistently shown that DER is associated with symptoms of eating disorders, and individuals with eating disorders tend to exhibit higher levels of DER [52, 53]. Specifically, difficulties in emotion regulation, such as low emotional awareness, difficulty accepting emotions, and impaired impulse control, have been linked to overeating behaviors [37]. Studies focusing on DER and eating disorders have highlighted that individuals with eating disorders often struggle with accepting and understanding their emotions, experiencing emotional ambiguity, and having reduced emotional awareness. Eating disorders are not only solely cognitive and behavioral processes but also involve emotional aspects. DER encompasses not only the understanding and

expression of emotions but also the ability to recognize, comprehend, and accept emotions, as well as the capacity to engage in goal-directed behaviors when faced with negative emotions, control impulsive behaviors, and employ adaptive strategies. These factors are crucial for maintaining psychological well-being and overall mental health.

#### **5.** Conclusion

The findings of this study indicate that there is a significant association between increased levels of DER and higher hedonic hunger and night-eating tendencies. This suggests that DER plays a significant role in the development and maintenance of eating disorders. These results have important implications for understanding the underlying factors contributing to eating disorders and informing treatment strategies in therapeutic interventions. By recognizing the influence of DER on eating behaviors, clinicians and researchers can better understand the complex interplay between emotion regulation and disordered eating. Considering DER as an integral component of eating disorders is crucial for comprehensive assessment, treatment planning, and addressing the emotional aspects of disordered eating. Incorporating interventions that target emotion regulation skills and coping strategies can enhance the effectiveness of interventions aimed at preventing and treating eating disorders.

The COVID-19 pandemic and the resulting lockdown measures have had significant impacts on various aspects of individuals' lives, including university students. These circumstances may contribute to the observed associations between DER and eating behaviors. The prolonged periods spent at home during the lockdown may lead to increased food consumption, even in the absence of physiological hunger, as individuals may turn to food for comfort or as a coping mechanism for stress and negative emotions. Changes in nutrition and sleep patterns during this period may also contribute to a shift in food intake towards evening hours. Moreover, the university age is a period characterized by heightened levels of anxiety and concerns about the future. These factors, combined with the challenges posed by the pandemic, may further exacerbate the difficulties experienced in emotion regulation and increase the risk of developing eating disorders. Addressing DER and promoting emotion regulation skills in young adults, particularly those at higher risk of developing eating disorders, could have preventive effects. Interventions aimed at enhancing emotion regulation abilities can equip individuals with effective coping strategies, emotional awareness, and adaptive responses to stressors. By empowering young adults with these skills, they may be better equipped to navigate the challenges and emotional distress associated with the university years and mitigate the risk of developing eating disorders. Therefore, comprehensive approaches that target both DER and eating behaviors, taking into account the unique challenges faced during the COVID-19 pandemic, can be beneficial in preventing and addressing eating disorders in university students.

5.1. Limitations and Strengths of the Study. The limitations of this study are that it was conducted in a single foundation university, the excess of female students (80.4%), and the mean age of university students ( $21.58 \pm 2.98$  years). In addition, the fact that the scales used were based on self-report may have caused the participants to answer the questions with a self-concealing or defensive attitude. To further explore the results of this study, it should be reexamined in different samples, such as community-based samples, where there is an excess of male participants.

The strengths and contributions of this study include its focus on a relevant and understudied topic, the use of multiple assessments and measures, the consideration of potential confounding variables, the integration of existing literature, implications for prevention and intervention, and the awareness of limitations and suggestions for future research. These strengths enhance the study's value in advancing our understanding of the relationship between emotion regulation and eating behaviors among university students and provide insights for future research and clinical practice.

#### **Data Availability**

The datasets used to support the findings of this study are available from the corresponding author on reasonable request.

### **Ethical Approval**

Ethical approval numbered 61351342/2021-68 and dated 29/ 01/2021 was obtained from Uskudar University Noninterventional Research Ethics Committee.

#### **Conflicts of Interest**

The authors declare that they have no conflicts of interest.

## **Authors' Contributions**

Pinar Hamurcu conceptualized the study, performed data curation and formal analysis, investigated the study, proposed the methodology, was responsible for project administration, supervised the study, wrote the original draft, and reviewed and edited the manuscript. Beyzanur Çamlıbel performed formal analysis, investigated the study, wrote the original draft, and reviewed and edited the manuscript.

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