Archives of Psychiatric Nursing 52 (2024) 1–7

Contents lists available at ScienceDirect

Archives of Psychiatric Nursing

journal homepage: www.elsevier.com/locate/apnu

Emotional eating mediates the relationship between perceived stress and body appreciation in adult male and female: A cross-sectional study in Turkey

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ARTICLE INFO

Keywords:
Stress
Emotional eating
Body appreciation
Obesity
Adult participants

ABSTRACT

The aim of this study was to investigate the association between adults' perceived stress, emotional eating, and body appreciation. The Emotional Eater Questionnaire (EES), the Perceived Stress Scale (PSS), and the Body Appreciation Scale-2 (BAS-2) were completed by 710 adult participants. Emotional eating was found to be adversely related to body appreciation in both female (=−0.232, p: <.001) and male ($\beta = -0.180, p < .05$). The study's findings highlighted the harmful impacts of perceived stress and emotional eating on the range of body appreciation. This finding shows that stress and emotion management should be considered in the context of adult body appreciation practices.

Introduction

Body image refers to both positive and negative emotions regarding one's own size, shape, and form, with only favorable ideas about the body being referred to as “body appreciation” (Grogan, 2021; Tiggemann, 2015). Body Appreciation is positively associated with well-being indicators (Lemoine et al., 2018; Swami et al., 2018), and negatively associated with eating disorder symptoms, psychological state and BMI levels (Avalos et al., 2005; Gillen, 2015; Iannantuono & Tylka, 2012; Tylka & Wood-Barcalow, 2015; Weinberger et al., 2016). According to the meta-analysis study, individuals' BMI levels were inversely related to body appreciation (He et al., 2020). Obese people, in particular, are more dissatisfied with their bodies than normal-weight people (Weinberger et al., 2016). It was also discovered that female have a stronger negative link between body appreciation and BMI than males (He et al., 2020). The fact that this relationship is higher in female than in male also increases perceived stress and body dissatisfaction (Quittkat et al., 2019). Several studies have found that stress has a negative impact on body image in various populations (Gillen, 2015; Murray et al., 2011). However, the relationship between stress and body appreciation has never been studied.

In addition to its psychological impacts, stress has harmful physiological and behavioral effects on health (Hammen, 2005). Because people use food to regulate their feelings and then lose control of their eating, stress increases the likelihood of emotional eating (Bennett et al., 2013). Increased cortisol levels and physiological stress reactions may cause this association, resulting in a desire for palatable food with a larger energy content (van Strien et al., 2013). Overeating may occur when the hypothalamus-pituitary-adrenal axis (HPA) is stimulated by both stress and palatable food intake (Adam & Epel, 2007). As a result, perceived stress has been recognized as a significant barrier to weight management. According to research, emotional eating regulates the interaction between different emotions, influencing food intake (van Strien et al., 2012, 2013). For instance, it has been demonstrated that eating emotionally influences the association between nutrient intake and mood, with good moods consuming more nutrients than sad moods. Furthermore, emotional eating in the face of the same emotions affects food intake; people with low emotional eating behaviors consume less food when unhappy or anxious, while those with high emotional eating behaviors eat more (van Strien et al., 2012; van Strien et al., 2013).

However, the significance of emotional eating in the link between stress and body appreciation has yet to be examined. In this study, we hypothesized that stress is connected with emotional eating and body appreciation, and that those who are stressed out are more likely to eat emotionally. Additionally, we proposed that the association between stress and body appreciation may be mediated by emotional eating. As a

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https://doi.org/10.1016/j.apnu.2024.06.016
Received 10 January 2023; Received in revised form 26 July 2023; Accepted 30 June 2024
Available online 5 July 2024
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result, the goals of this study are as follows: (1) to determine the relationship between perceived stress, emotional eating, and body appreciation; (2) to investigate the relationship between emotional eating and body appreciation; and (3) to determine whether emotional eating mediates the relationship between perceived stress and body appreciation.

Method and materials

Study design

This is a cross-sectional study evaluating the relationship between perceived stress, body appreciation, and emotional eating among participants located in a capital of Turkey.

Participants

Adult participants, who are staff or students at a university living in Ankara, Turkey were requested to complete a nutrition questionnaire in 2019. Inclusion criteria for participation were being 19 years or older, being a student or staff at university and residing in Ankara. Participants who had a chronic illness, psychological issues, or were pregnant were excluded. These criteria were verified by answers given to the corresponding survey questions. To determine sample size, G Power Analysis was utilized as the software. A minimum of 595 participants were required to obtain a Type I error () = 0.05 and a power of 95 %. A total of 918 participants were contacted. However, as some questionnaires either did not meet the inclusion criteria or contained incomplete data, the responses of 710 participants, of whom 202 (28.5 %) were male and 508 (71.5 %) were female, were used in the data analysis. Dietitians used questionnaire forms and face-to-face interviews to obtain research data. The questionnaire included questions about sociodemographics, anthropometric measurements, emotional eating, perceived stress, and body appreciation (Appendix 1).

Ethics

The questionnaire was completed anonymously, and participants were assured of the confidentiality of their data. This study was conducted out in compliance with the World Medical Association's Code of Ethics, the Declaration of Helsinki, and the University of Ankara Ethics Committee approval (Protocol no: 111-989). Prior to completing the questionnaire, each participant was verbally informed of the study's goal and requested to sign a consent form showing their voluntary acceptance to participate in the research.

Instruments

Emotional Eater Questionnaire (EEQ)

The Emotional Eater Questionnaire (EEQ) scale was used to assess emotional eating (Garaulet et al., 2012). The scale is made up of ten questions and three components, which include disinhibition, type of food, and guilt. Individuals responded to the questionnaire on a scale of 0–3 (0-never, 1-sometimes, 2-generally, 3-always) based on their level of agreement ranging from never to always. There was no reverse scored item on the scale. The possible range was from 0 to 30 points. High scores on the scale indicate a high level of emotional eating behavior. For clinical practice, the subjects were divided into four groups is used to determine the level of emotional eating severity, ranging from non-emotional eater (score 0–5), low emotional eater (scores of 6–10), emotional eater (scores of 21–30) and very emotional eater (scores of 21–30). This instrument had previously been confirmed in a similar Turkish population, with a total Cronbach's alpha of 0.84. Cronbach's alpha for the “Disinhibition” subscale was 0.81, for the “Type of food” subscale was 0.57, and for the “Guilt” subscale was 0.64 (Arslantaş et al., 2019). The total Cronbach-alpha in this study is 0.86, and the Cronbach's alpha was 0.830.

Perceived Stress Scale (PSS)

This scale, developed by Cohen et al. (1983), was used to measure how stressful an individual finds certain situations in his or her life when assessing perceived stress. The scale consists of fourteen items and two sub-dimensions on a 5-point Likert scale (0-never to 4-very often). The fourth, fifth, sixth, seventh, ninth, tenth and thirteenth items containing positive statements are scored in reverse. The score that can be obtained from the scale is between 0 and 56. A high score indicates a high level of perceived stress. The sub-dimensions of the scale include the perception of inadequate self-efficacy and the perception of stress/discomfort. The total score obtained from the scale indicates the person's level of stress. The Cronbach alpha value in the original form of the scale ranged from 0.75 to 0.86 for the total scale and the sub-dimensions (Cohen et al., 1983). The scale had previously been adapted into Turkish by Eskin et al. (2013). The internal consistency coefficient for the overall scale was 0.82 in the validity and reliability research, and the test-retest reliability coefficient was 0.88. The overall Cronbach's alpha in the current study is 0.83.

Body Appreciation Scale-2 (BAS-2)

The Body Appreciation Scale-2 is a refined form of the BAS developed by Avalos et al. (2005) and Tylka and Wood-Barcalow (2015). In this study, the BAS-2 was used to measure body appreciation (Tylka & Wood-Barcalow, 2015). There are ten items that are rated using a 5-point Likert scale (ranging from 1-never to 5-very often). The total body esteem score can be obtained by summing the scores of all the items in the scale. There are no reverse-coded items in the scale. Possible scores range from 10 to 50. High scores indicate that the individual has a high level of body appreciation. For the 10-item BAS-2, the scale's original Cronbach's coefficient alphas were 0.90. The scale was adapted into Turkish by Anlı et al. (2015), and the internal consistency coefficient for the total scale is 0.88. Cronbach's alpha is 0.95 (Anlı et al., 2015).

Anthropometric measurements

A digital scale was used to measure the body weight of participants wearing light clothing but no shoes or socks. A calibrated stadiometer (Seca 217, Germany) was used to measure height to the nearest 0.1 cm. Body mass index (BMI) was determined for all participants, who were then classified as “underweight” if their BMI was <18.5 kg/m^2, “normal” if their BMI was 18.5–24.9 kg/m^2, “overweight” if their BMI was 25.0–29.9 kg/m^2, and obese if their BMI was 30.0 kg/m^2 (World Health Organization, 2000).

Demographics

A questionnaire was used to assess socio-demographic variables such as age, gender, marital status, disease presence and income.

Procedure

Participants were requested to participate in the research by making announcements in various places such as cafeterias, libraries, and classrooms by the university to which the research is affiliated. The dietitian research team met with people who wanted to take part in the study following this announcement. After the team described the requirements for participation and inclusion and exclusion criteria, each participant was given an appointment by the team. Individual interviews were conducted at the research team's own institution in Ankara. Researchers gave participants verbal and visual information on how to respond to the items in each questionnaire. Individuals who completed the questionnaire were included in the analysis.

Data analyses

All statistical analyses were performed using SPSS software version 25.0, and multiple mediational models were performed using a SPSS analysis for moment structures (AMOS). The normality of the data was investigated using visual (histogram) and analytical methods (Kolmogorov–Smirnov test). Descriptive statistics for sociodemographic, emotional eating, perceived stress, and body appreciation scores, and anthropometric characteristics were presented as mean ± SD, or as a proportion of the total sample size. An Independent *t*-test was used to compare emotional eating, perceived stress, and body appreciation scores between the sexes. Pearson correlations were performed to investigate bivariate associations between body appreciation, perceived stress, emotional eating, BMI, sex, and age. In addition, mediation analysis by sex was conducted using body appreciation as a dependent variable, perceived stress as an independent variable, and emotional eating as a mediator variable. In the SEM, we controlled for age and BMI. The Maximum Likelihood method was also applied as an estimator. This method assumes joint normality for the variables included in the model. Bootstrapping was used to estimate 5000 resamples, and 95 % confidence intervals (CIs) were used to evaluate indirect effects. The goodness-of-fit tests were: discrepancy Chi-square (reports the model versus saturated test); root mean squared error of approximation (RMSEA); standardized root mean squared residual (SRMR); CFI comparative fit index (CFI), and the goodness fit index (GFI). The CFI and GFI values ≥ of 0.95, the SRMR values ≤ of 0.08, and the RMSEA values ≤ of 0.06 considered indicating a good fit for the data (Hu & Bentler, 1999).

Results

Table 1 shows the characteristics of the adult participants by gender. The mean age of the participants was 26.4 ± 8.8 years. The majority of the adults, 604 (85.1 %) were married or living with a partner, and the remainder were single, the difference was not statistically significant. There was a significant association between the smoking and alcohol status, and sex ($p < .001$). The mean BMI was 23.5 ± 4.4 kg/m^2 with a significant difference of female with overweight/obesity compared with normal weight (28.9 % versus 62.1 %, $p < .001$). The emotional eating and perceived stress scores were higher in females (Mean = 11.4 SD = 5.4; Mean = 32.3 SD = 5.4, respectively) than males (Mean = 9.6 SD = 5.3; Mean = 30.8 SD = 5.4, respectively) ($p < .001$), which indicated that emotional eating and stress is a greater problem for females. In addition, the mean body appreciation scores were significantly higher in males (Mean = 38.1 SD = 9.0) than females (Mean = 36.5 SD = 9.4) ($p < .05$).

Table 1
Characteristics of the adult participants by sex.

Variables	Female	Male	Total	p
Age, mean (SD)	26.7 (9.1)	25.6 (7.9)	26.4 (8.8)	.137
Marital status, n (%)				
Single	36 (8.2 %)	70 (25.9 %)	106 (14.9 %)	.243
Married or living a partner	404 (91.8 %)	200 (74.1 %)	604 (85.1 %)	
Smoking status, n (%)				
Yes	117 (23.0)	95 (47.0 %)	212 (29.9 %)	<.001**
No	391 (77.0)	107 (53.0 %)	498 (70.1 %)	
Alcohol status, n (%)				
Yes	83 (41.1 %)	80 (15.7 %)	163 (23.0 %)	<.001**
No	119 (58.9 %)	428 (84.3 %)	547 (77.0 %)	
BMI, mean (SD)	23.1 (4.7)	24.4 (3.8)	23.5 (4.4)	<.001**
Underweight	61 (12.0 %)	3 (1.5 %)	64 (9.0 %)	<.001**
Normal	311 (61.2 %)	130 (64.4 %)	441 (62.1)	
Overweight	91 (17.9 %)	55 (27.2 %)	146 (20.6 %)	
Obese	45 (8.9 %)	14 (6.9 %)	59 (8.3 %)	
Emotional eating, mean (SD)	11.4 (5.7)	9.6 (5.3)	10.9 (5.7)	<.001**
Perceived stress, mean (SD)	30.8 (5.4)	32.2 (5.4)	31.9 (5.4)	.002*
Body appreciation, mean (SD)	36.5 (9.4)	38.1 (9.1)	36.9 (9.3)	.039*

BMI: Body Mass Index; Numeric variables are presented as mean (standard deviation). Nominal variables are shown as percentage (frequency).
* Significant at $p < .05$.
** Significant at $p < .001$.

Table 2 shows the correlations between the variables. Accordingly, significant and positive correlations were found between emotional eating, perceived stress, BMI, and sex. Therefore, when modeling we added age and BMI as covariates for body appreciation and created two models according to participants' sex. The BAS scores revealed a negative significant correlation between emotional eating scores ($r = -0.337$; $p < .001$). A significant correlation was identified between perceived stress and age ($r = 0.279$; $p < .001$). The BMI and body appreciation were also significantly associated ($r = -0.196$; $p < .001$).

Fig. 1 provides a graphical representation of the mediation model and the regression coefficients. An association between perceived stress and body appreciation (path c) was found in males ($p < .001$) and females ($p < .001$); perceived stress and emotional eating (path a) was also significant in both groups, when adjusted according to BMI and age ($p < .001$, for both sexes). Additionally, significant negative associations between emotional eating and body appreciation (path b), ($p < .001$ for both sexes) were associated with BMI. Thus, lower body appreciation was associated with higher perceived stress scores, and with higher emotional stress scores, implying that people with higher stress and emotional eating difficulties also had lower body appreciation.

Table 3 details the effects of the mediation analysis with the corresponding bias-corrected at a 95 % confidence interval (bootstrapping technique) by sex. The direct, indirect, and total effects of perceived stress on body appreciation were significant in both males and females. The full model including perceived stress, emotional eating and confounders was significant, explaining 19.4 % and 10.8 % of the variance in body appreciation for female and male respectively.

Discussion

This study demonstrated that emotional eating was also positively associated with perceived stress, BMI, and sex. Furthermore, the BAS score, which indicated body appreciation, was found to be inversely related to emotional eating scores and BMI. There was a strong relationship found between perceived stress and age, as well as BMI and body appreciation. Furthermore, according to the mediation analysis results, emotional eating was identified as a mediator between perceived stress and body appreciation in both males and females. The indirect effect of perceived stress on body appreciation via emotional eating accounted for a substantial proportion of the total effect in both male and female. To our knowledge, this is the first study to show that emotional eating may act as a mediator between perceived stress and body appreciation in adults.

As hypothesized, perceived stress was found to be negatively related to body appreciation, and positively related to emotional eating. Perceived stress was adversely correlated with body appreciation, although the relationship was not significant. However, the relationship between perceived stress and body appreciation by sex was significant, when BMI and age as covariates. Several studies have found that people with high perceived stress levels also appreciate their bodies less (Johnson & Wardle, 2005; Urvelyte & Perminas, 2020). High levels of stress are linked to increased visceral adiposity and body weight gain (Laugero et al., 2011; Mouchacca et al., 2013; Nastaskin & Fiocco,

Table 2
Correlation of the variables in adult participants.

Variables	1	2	3	4	5	6
1. Emotional eating	1					
2. Perceived stress	0.279**	1				
3. Body appreciation	−0.337**	−0.300	1			
4. Age	0.021	−0.167**	0.032	1		
5. BMI	0.299**	−0.039	−0.196**	0.398**	1	
6. Sex[a]	0.126**	0.126**	−0.078*	0.009	−0.220**	1

The Pearson test was performed.
[a] The Spearman test was performed. 1 = male, 2 = female.
* p < .05.
** p < .001.

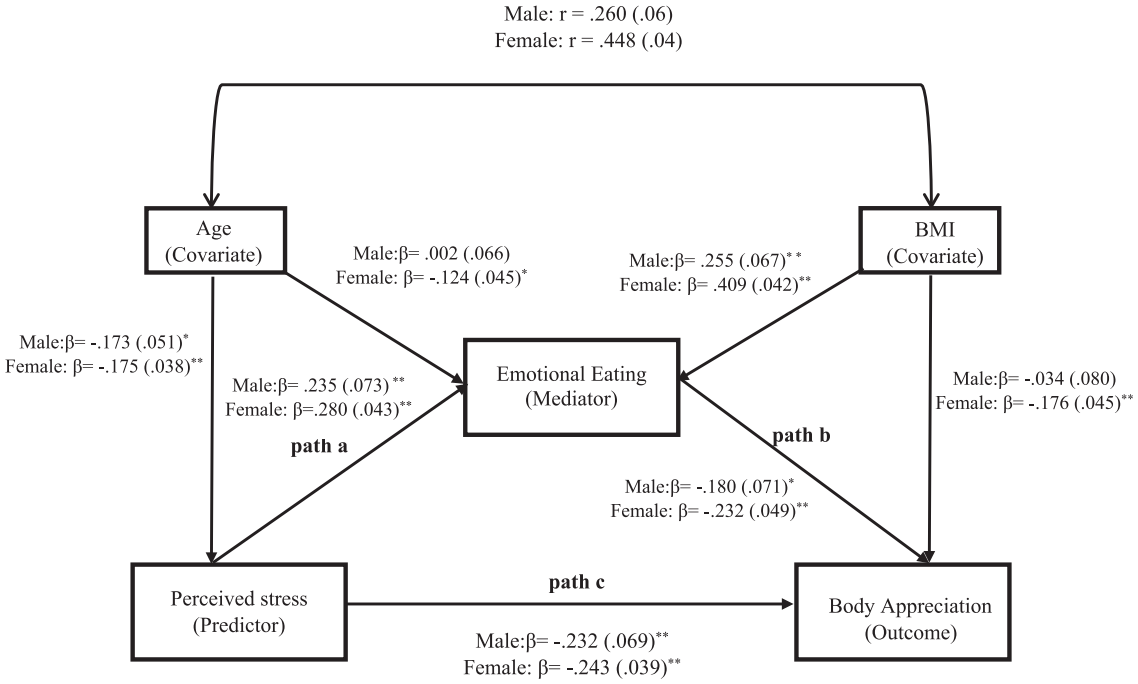


Fig. 1. Graphical representation of the mediation model. Results from structural equation modeling, unstandardized regression coefficients (β) and standard errors (SE) by sex. *p < .05, **p < .001. (Model fit indices; CMIN/DF: 1.845, GFI: 0.996, AGFI: 0.969, CFI: 0.992, RMSEA: 0.035, RMR: 0.0402).

Table 3
Standardized total, direct and indirect effects in the adult participants' path model.

Variables	Males			Females		
	β (SE)	95 % Cl	p	B (SE)	95 % Cl	p
Mediator: emotional eating						
Direct effect						
Perceived stress on body appreciation (path c in Fig. 1)	−0.232 (0.069)	−0.362, −0.092	**.001****	−0.243 (0.039)	−0.318, −0.167	**<.001****
Total effect						
Perceived stress on body appreciation (path c + path ab in Fig. 1)	−0.274 (0.067)	−0.403, −0.138	**<.001****	−0.308 (0.040)	−0.385, −0.229	**<.001****
Indirect effect						
(via emotional eating) of perceived stress on body appreciation (path ab in Fig. 1)	−0.042 (0.23)	−0.096, −0.006	**<.015***	−0.065 (0.017)	−0.100, −0.035	**<.001****
Indirect effect (%)		10.8 %			19.4 %	

β: beta; SE: standard error. *p < .05; **p < .001 (model fit indices CMIN/DF: 1.845, GFI: 0.996, AGFI: 0.969, CFI: 0.992, RMSEA: 0.035, RMR: 0.0402).

2015); High levels of stress are associated with increased visceral adiposity and weight gain, which decreases a person's body satisfaction. Furthermore, among obese people, the desire to be skinny increases perceived stress and decreases body appreciation (Tylka & Wood-Barcalow, 2015). Two viewpoints may shed light on the importance of BMI in body appreciation. From a functional perspective, other things being equal, social appreciation may decrease as BMI reaches obesity levels (Uhlmann et al., 2018). Furthermore, being overweight may restrict physical functioning, therefore one may expect a negative relationship between BMI and body appreciation. Furthermore, being overweight is stigmatized in society, which contributes to the stress experienced by overweight people (Andreyeva et al., 2008). Prejudice

and discrimination against overweight people are caused by societal stigma, which produces a stressful atmosphere, particularly for female (Fikkan & Rothblum, 2012).

Sex and BMI can be important factors in the relationship between perceived stress and body appreciation. In comparison to normal-weight male, underweight male are more unsatisfied with their life and perceive themselves feel less attractive with less sexy appeal. Since the perception of beauty in female is characterized by an underweight body, this situation is less common in female (Grogan, 2021). Similarly, this study showed that the BAS score was not found to be significantly higher in underweight male compared to normal men. However, in females, the BAS score of normal individuals was significantly higher than that of obese and overweight individuals. Although studies on weight stigma in underweight individuals are limited, previous literature emphasizes that this issue should be examined especially in men. In this study, since the proportion of underweight male was very low, gender and BMI, which were effective factors on body satisfaction, were included in the relationship as covariance.

Such a stressful environment may diminish body appreciation, especially among females. Our findings support this interpretation by stressing the negative association between BMI and body appreciation in females, but not in males. Similar to this, several research found a statistically significant inverse association between female BMI and body appreciation (Luo et al., 2020; Swami et al., 2010), while a negligible relationship was shown between body appreciation and BMI in male (Swami et al., 2019). However, different studies have reported different significant correlations and even statistically significant positive correlations for male (Swami et al., 2018). Studies of females showed the magnitude of correlation varies widely across groups (Luo et al., 2020; Swami et al., 2010).

Our results provide additional support for the association between perceived stress and emotional eating. Perceived stress was a significant and positive predictor of emotional eating. This finding is partially consistent with previous studies that have reported that excessive food intake can help reduce negative mood traits such as anxiety, sadness, anger, frustration, and stress (Konttinen et al., 2010: Mooreville et al., 2014; van Strien et al., 2013). This study is also consistent with the findings of Diggins et al. (2015), who found that college-aged black female tend to cope with negative emotions generated by stressful events by engaging in emotional eating.

The emotional eating score was found to be inversely relation to body appreciation in this study. To date, many studies have shown that emotional eating is associated with body image (Tylka & Wood-Barcalow, 2015). Although various theoretical frameworks have been developed to investigate how risk factors interact to predict a poor body image and disordered eating, the relationship between emotional eating and body appreciation has yet to be investigated (Tylka & Subich, 2004). Augustus-Horvath and Tylka (2011), on the other hand, claim that females, in particular, eat in response to hunger cues and are more appreciative of their own bodies when they do not focus on how they perceive someone else's physique. Avoiding self-comparison indirectly reduces emotional eating behavior. As a result, in order to reduce the prevalence of major eating disorders, it is critical to have a complete understanding of the relationship between negative emotions and eating behavior (Eddy et al., 2007; Goossens et al., 2009).

The indirect effect of perceived stress on body appreciation via emotional eating accounts for a large amount of the total effect. Our data show that the female model has higher total, indirect, and direct beta coefficients, as well as a larger total effect ratio than the male model. The mediation analysis results differ by gender, which may be attributable to females' lesser body appreciation (Grogan, 2021). It is reported that female have low body appreciation levels due to their vulnerability to psychopathologies relating to their bodies (Lewinsohn et al., 2002; Striegel-Moore et al., 2009). Similarly, the current meta-analysis found that male participants showed a higher level of body admiration than females, however the impact size was small (He et al., 2020).

Limitations

Although this study implies that emotional eating may act as a mediator between perceived stress and body enjoyment, there are some limitations to consider. First, because of the cross-sectional design, causal correlations cannot be deduced, and the results may not apply to the broader population because the population was not included in all aspects. Furthermore, the majority of the subjects were between the ages of 19 and 35 and had a normal BMI. We could not design the model mediating for BMI, because we could not provide examples of significance in the model. Secondly, self-reported questionnaires were applied in the study to assess emotional eating, body appreciation and perceived stress. In this study, the low emotional eater (43.9 %) and emotional eater (43.9 %) categories were higher. Because the emotional eating scale questions are subjective, the findings differ from person to person. Observing the food intake behaviors of participants for the emotions they feel can help to achieve more accurate results in order to better understand emotional eating. For this reason, observational studies involving individuals with different emotional eating scores may provide different results. Besides, the emotional eating scale was developed for obese individuals. Therefore, sub-dimensions of the scale were not used. Relationships can be tested in future studies by utilizing the scale's sub-dimensions. In comparison to the present research on body appreciation, this study contributed by demonstrating the mediation function of emotional eating in the link between perceived stress and body appreciation. According to BMI, the majority of those taking part in this study have a normal body weight. To assess the consistency of this conclusion, more study into diverse population groups, the majority of which have different BMI values, would be required. Finally, long-term research are required to assess the long-term impact of perceived stress and emotional eating on body appreciation. Despite these limitations, this study added new insights to the existing literature on stress, emotional eating, and body appreciation, and it may also guide future research.

Clinical implications

This study emphasizes that psychiatric nurses should focus on improving body appreciation while managing stress and emotional eating processes in obesity treatment and health promotion. The reduction of perceived stress and emotional eating has an important role in improving the quality of life and promoting health, depending on the improvement of the body appreciation. Therefore, obesity prevention programs and clinical life programs should focus on improving body appreciation. Such issues should also be covered in educational programs. In particular, it would be useful to be aware of the fact that stress has an effect on body appreciation, and even that emotional eating mediates this relationship, and to examine emotional eating by a multidisciplinary team in psychosocial support for body appreciation, especially in the approach by the family physician to individuals who apply to the hospital for body weight control or who are not at peace with their bodies. In the literature, it is stated that multidisciplinary, that is, weight loss programs based on the cooperation of patients, doctors, nurses, dietitians and other specialists, are the most effective methods of improving psychophysical well-being and facilitating lifestyle changes (Pratt et al., 2013). The awareness of all healthcare professionals, especially dietitians, nurses and doctors, about the importance of behavior modification treatments is a chance for an effective struggle in improving health.

Conclusion

Emotional eating was found to be a mediator between perceived stress and body appreciation in the current study, which included both males and females. However, there are more aspects that should be taken into account as well, such as media and advertising. The control of

stress and emotional eating should be an essential component of improved body appreciation. Stress reduction and emotional eating should also be included in an integrative approach to high body appreciation. Additionally, increasing public knowledge of the stigma associated with weight may have a favorable impact on judgments of body appreciation.

Ethical approval and consent to participate

This study was carried out in accordance with The Code of Ethics set out by the World Medical Association, the Declaration of Helsinki, and the approval of the Ethics Committee received from the University of Ankara (Protocol no: 111–989). Each participant provided written informed consent to participate in the current study.

Consent to participate

Each participant was verbally informed about the purpose of the study, and they were asked to sign informed consent forms indicating their voluntarily agreement to participate in the research.

Consent for publication

Not applicable.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sector.

CRediT authorship contribution statement

HY, NE, and NNAÇ designed the study. NNAÇ performed the analysis. NE and NNAÇ drafted the initial manuscript and HY revised the manuscript; HY, NE, and NNAÇ provided important advice for the calculations, reviewed and revised the manuscript making important intellectual contributions; All authors read and approved the final manuscript.

Declaration of competing interest

The authors declare no conflict of interest.

Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Acknowledgements

We are grateful to Academic Proofreader Ltd. for English language editing.

Code availability

Not applicable.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.apnu.2024.06.016.

References

Adam, T. C., & Epel, E. S. (2007). Stress, eating and the reward system. *Physiology & Behavior, 91*(4), 449–458.
Andreyeva, T., Puhl, R. M., & Brownell, K. D. (2008). Changes in perceived weight discrimination among Americans, 1995–1996 through 2004–2006. *Obesity, 16*(5), 1129–1134.
Anlı, G., Akın, A., Eker, H., & Özçelik, B. (2015). The validity and reliability of Turkish version of the Body Appreciation Scale. *The Journal of Academic Social Science Studies, 36*, 505–511.
Arslantaş, H., Dereboy, F., Yüksel, R., & İnalkaç, S. (2019). Duygusal yeme ölçeği'nin türkçe çevirisinin geçerlik ve güvenirlik çalışması. *Türk Psikiyatri Dergisi, 30*, 1–10.
Augustus-Horvath, C. L., & Tylka, T. L. (2011). The acceptance model of intuitive eating: A comparison of women in emerging adulthood, early adulthood, and middle adulthood. *Journal of Counseling Psychology, 58*(1), 110.
Avalos, L., Tylka, T. L., & Wood-Barcalow, N. (2005). The body appreciation scale: Development and psychometric evaluation. *Body Image, 2*(3), 285–297.
Bennett, J., Greene, G., & Schwartz-Barcott, D. (2013). Perceptions of emotional eating behavior. A qualitative study of college students. *Appetite, 60*, 187–192.
Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 385–396.
Diggins, A., Woods-Giscombe, C., & Waters, S. (2015). The association of perceived stress, contextualized stress, and emotional eating with body mass index in college-aged Black women. *Eating Behaviors, 19*, 188–192.
Eddy, K. T., Tanofsky-Kraff, M., Thompson-Brenner, H., Herzog, D. B., Brown, T. A., & Ludwig, D. S. (2007). Eating disorder pathology among overweight treatment-seeking youth: Clinical correlates and cross-sectional risk modeling. *Behaviour Research and Therapy, 45*(10), 2360–2371.
Eskin, M., Harlak, H., Demirkiran, F., & Dereboy, Ç. (2013). The adaptation of the perceived stress scale into Turkish: A reliability and validity analysis. *New Symposium Journal, 51*(3), 132–140.
Fikkan, J. L., & Rothblum, E. D. (2012). Is fat a feminist issue? Exploring the gendered nature of weight bias. *Sex Roles, 66*(9), 575–592.
Garaulet, M., Canteras, M., Morales, E., López-Guimerà, G., Sánchez-Carracedo, D., & Corbalán-Tutau, M. D. (2012). Validation of a questionnaire on emotional eating for use in cases of obesity; the Emotional Eater Questionnaire (EEQ). *Nutrición Hospitalaria, 27*(2), 645–651.
Gillen, M. M. (2015). Associations between positive body image and indicators of men's and women's mental and physical health. *Body Image, 13*, 67–74.
Goossens, L., Braet, C., Van Vlierberghe, L., & Mels, S. (2009). Loss of control over eating in overweight youngsters: The role of anxiety, depression and emotional eating. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association, 17*(1), 68–78.
Grogan, S. (2021). *Body image: Understanding body dissatisfaction in men, women, and children*. Routledge.
Hammen, C. (2005). Stress and depression. *Annual Review of Clinical Psychology (2005), 1*(1), 293–319.
He, J., Sun, S., Lin, Z., & Fan, X. (2020). The association between body appreciation and body mass index among males and females: A meta-analysis. *Body Image, 34*, 10–26.
Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55.
Iannantuono, A. C., & Tylka, T. L. (2012). Interpersonal and intrapersonal links to body appreciation in college women: An exploratory model. *Body Image, 9*(2), 227–235.
Johnson, F., & Wardle, J. (2005). Dietary restraint, body dissatisfaction, and psychological distress: A prospective analysis. *Journal of Abnormal Psychology, 114*(1), 119.
Konttinen, H., Männistö, S., Sarlio-Lähteenkorva, S., Silventoinen, K., & Haukkala, A. (2010). Emotional eating, depressive symptoms and self-reported food consumption. A population-based study. *Appetite, 54*(3), 473–479.
Laugero, K. D., Falcon, L. M., & Tucker, K. L. (2011). Relationship between perceived stress and dietary and activity patterns in older adults participating in the Boston Puerto Rican Health Study. *Appetite, 56*(1), 194–204.
Lemoine, J. E., Konradsen, H., Jensen, A. L., Roland-Lévy, C., Ny, P., Khalaf, A., & Torres, S. (2018). Factor structure and psychometric properties of the Body Appreciation Scale-2 among adolescents and young adults in Danish, Portuguese, and Swedish. *Body Image, 26*, 1–9.
Lewinsohn, P. M., Seeley, J. R., Moerk, K. C., & Striegel-Moore, R. H. (2002). Gender differences in eating disorder symptoms in young adults. *International Journal of Eating Disorders, 32*(4), 426–440.
Luo, Y. J., Jackson, T., Niu, G. F., & Chen, H. (2020). Effects of gender and appearance comparisons on associations between media-based appearance pressure and disordered eating: Testing a moderated mediation model. *Sex Roles, 82*(5), 293–305.
Mooreville, M., Shomaker, L. B., Reina, S. A., Hannallah, L. M., Cohen, L. A., Courville, A. B., … Yanovski, J. A. (2014). Depressive symptoms and observed eating in youth. *Appetite, 75*, 141–149.
Mouchacca, J., Abbott, G. R., & Ball, K. (2013). Associations between psychological stress, eating, physical activity, sedentary behaviours and body weight among women: A longitudinal study. *BMC Public Health, 13*(1), 1–11.
Murray, K. M., Byrne, D. G., & Rieger, E. (2011). Investigating adolescent stress and body image. *Journal of Adolescence, 34*(2), 269–278.
Nastaskin, R. S., & Fiocco, A. J. (2015). A survey of diet self-efficacy and food intake in students with high and low perceived stress. *Nutrition Journal, 14*(1), 1–8.
Pratt, K. J., Lazorick, S., Lamson, A. L., Ivanescu, A., & Collier, D. N. (2013). Quality of life and BMI changes in youth participating in an integrated pediatric obesity treatment program. *Health and Quality of Life Outcomes, 11*, 116.

Quittkat, H. L., Hartmann, A. S., Düsing, R., Buhlmann, U., & Vocks, S. (2019). Body dissatisfaction, importance of appearance, and body appreciation in men and women over the lifespan. *Frontiers in Psychiatry, 10*, 864.
Striegel-Moore, R. H., Rosselli, F., Perrin, N., DeBar, L., Wilson, G. T., May, A., & Kraemer, H. C. (2009). Gender difference in the prevalence of eating disorder symptoms. *International Journal of Eating Disorders, 42*(5), 471–474.
Swami, V., Begum, S., & Petrides, K. V. (2010). Associations between trait emotional intelligence, actual–ideal weight discrepancy, and positive body image. *Personality and Individual Differences, 49*(5), 485–489.
Swami, V., Khatib, N. A. M., Toh, E., Zahari, H. S., Todd, J., & Barron, D. (2019). Factor structure and psychometric properties of a Bahasa Malaysia (Malay) translation of the Body Appreciation Scale-2 (BAS-2). *Body Image, 28*, 66–75.
Swami, V., Weis, L., Barron, D., & Furnham, A. (2018). Positive body image is positively associated with hedonic (emotional) and eudaimonic (psychological and social) well-being in British adults. *The Journal of Social Psychology, 158*(5), 541–552.
Tiggemann, M. (2015). Considerations of positive body image across various social identities and special populations. *Body Image, 14*, 168–176.
Tylka, T. L., & Subich, L. M. (2004). Examining a multidimensional model of eating disorder symptomatology among college women. *Journal of Counseling Psychology, 51*(3), 314.
Tylka, T. L., & Wood-Barcalow, N. L. (2015). The Body Appreciation Scale-2: Item refinement and psychometric evaluation. *Body Image, 12*, 53–67.
Uhlmann, L. R., Donovan, C. L., Zimmer-Gembeck, M. J., Bell, H. S., & Ramme, R. A. (2018). The fit beauty ideal: A healthy alternative to thinness or a wolf in sheep's clothing? *Body Image, 25*, 23–30.
Urvelyte, E., & Perminas, A. (2020). The relationship between negative affect, stress and body image in adolescent girls. *Global Journal of Psychology Research: New Trends and Issues, 10*(2), 154–159.
van Strien, T., Cebolla, A., Etchemendy, E., Gutierrez-Maldonado, J., Ferrer-Garcia, M., Botella, C., & Baños, R. (2013). Emotional eating and food intake after sadness and joy. *Appetite, 66*, 20–25.
van Strien, T., Herman, C. P., Anschutz, D. J., Engels, R. C., & de Weerth, C. (2012). Moderation of distress-induced eating by emotional eating scores. *Appetite, 58*(1), 277–284.
Weinberger, N. A., Kersting, A., Riedel-Heller, S. G., & Luck-Sikorski, C. (2016). Body dissatisfaction in individuals with obesity compared to normal-weight individuals: A systematic review and meta-analysis. *Obesity Facts, 9*(6), 424–441.
World Health Organization. (2000). Obesity: Preventing and managing the global epidemic. Retrieved Jan 15, 2021 from https://apps.who.int/iris/handle/10665/42330.