

The effect of diet on emotional eating behaviours in individuals*

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Summary Background. Emotional eating is reported to amount to at least 60% in overweight or obese individuals. Emotional eating is a eating behaviour disorder that describes the tendency to binge in response to positive or negative emotions. Reactions to these emotional situations vary from person to person. In addition to its independent effect on weight gain, emotional eating is also known to be associated with low weight loss.

Objectives. In this study, we aimed to detect the differences in emotional eating behaviours between dieters and non-dieters and emotional eating behaviours in individuals who diet frequently.

Material and methods. A socio-demographic form consisting of 14 questions and the Dutch Eating Behaviour Scale (DEBQ) consisting of 33 questions were applied to the patients. When the patients who were followed up came for control one month later, the DEBQ scale was repeated.

Results. When emotional eating behaviours, restrictive eating behaviours and external eating behaviours were evaluated between the patient and control groups, a significant relationship was found in both groups ($p = 0.000$, $p = 0.000$, $p = 0.001$). It was observed that the total scores of the DEBQ scale and external eating behaviours were higher in those who followed 3 or more diets ($p = 0.001$, $p = 0.001$).

Conclusions. We found that emotional eating behaviours were higher in dieters than in those who did not diet. Emotional eating behaviour was found to be higher in those who diet frequently.

Key words: obesity, diet, feeding behavior.

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Background

Obesity is an important risk factor for coronary heart disease, type 2 diabetes mellitus, hyperlipidaemia, hypertension, obstructive sleep apnoea syndrome and some types of cancers [1]. In addition, studies have shown that these diseases with increased risk improve with weight loss [2–4]. According to the McKinsey Global Institute report, obesity is the second biggest public health problem after smoking. Its economic impact on the world is similar to war and terrorism [5].

Behaviour/lifestyle changes, dietary interventions, physical exercise, pharmacotherapy and bariatric surgery are recommended in the treatment of obesity. In general, a low-calorie diet and increased physical activity combined with behavioural strategies such as self-monitoring are recommended as the first step in patients who will benefit from weight loss [6, 7]. Although it has positive effects in the short term, some patients return to their old weight or gain more weight in a short time after a diet. Studies have linked this to emotional eating [8].

The tendency to overeat in response to positive or negative emotions is defined as emotional eating [9]. This is reported to amount to at least 60% of all overweight or obese individuals.

It is important to explore emotional eating due to its effects on weight and overall health [10].

Emotional eating is a eating behaviour disorder that describes the tendency to binge in response to positive or negative emotions. The underlying physiological mechanism is not fully understood. When individuals feel angry or pressured, they consume more food than usual. Others do not eat at all when they are overly excited and happy. Reactions to these emotional situations vary from person to person [11]. In addition to its independent effect on weight gain, emotional eating is also known to be associated with low weight loss [10].

It has been shown that dieters may be more likely to lose control over their eating. Past or current dieters have higher emotional eating behaviours than people without a dietary history [12]. However, it has been shown that dietary history does not have any moderator effect on the relationship between emotional eating behaviours and weight status [12, 13].

It is also unclear whether a diet influences emotional eating behaviours or whether high emotional eating behaviours can predispose a person to diet. Studies on this topic are limited in literature. In a different study, it was shown that emotional eating behaviours were better in the dieting group in the past, although not as much as in the current dieting group, compared to those

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who did not diet at all. This is attributed to the continuation of the behaviours gained during the diet and after the diet [13].

Objectives

Changes in emotional eating behaviours before and after dieting have not been evaluated in literature. Therefore, in this study, we aimed to evaluate whether dieting has any effect on the emotional eating behaviours of individuals.

Material and methods

Study design

First of all, necessary permissions were obtained from the local ethics committee (2019/443) for the study. This study was designed as a case-control study. Medium effect size w : 0.50 and 95% statistical power and 0.05 significance level; the required sample size was calculated as 90 patients and 90 control subjects.

Our patient group was conducted with 96 patients who applied to the obesity outpatient clinic between December 2019 – May 2020 in the Community Health Centre Healthy Life Centre in Bolu. Overweight or obese individuals who did not want to diet were determined as the control group. 90 participants were also included in the control group. However, 8 of the 90 participants in the control group were excluded from the study because they did not complete the socio-demographic and scale forms. Therefore, 82 participants were formed as a control group.

Individuals over the age of 18 who agreed to participate in our study were included. Necessary information was given about the study, and their consent was obtained. Participants with psychiatric and/or chronic illnesses and medications that should be used continuously were excluded from the study.

The participants in the patient group were contacted by phone 15 days after the first evaluation and verbally questioned whether they followed the diet programme given. The patients were then called for control one month after the first evaluation and 15 days after the phone call, and their compliance with the diet programme was questioned. A second assessment was made. The DEBQ scores of the participants (n : 96) who had full compliance with the diet programme during a one-month period were recalculated.

Data collection

A socio-demographic form consisting of 14 questions and the Dutch Eating Behaviour Scale (DEBQ) consisting of 33 questions was administered to obese or overweight individuals who applied to the outpatient diet clinic for weight loss.

Socio-demographic form

Participants were given a form consisting of 14 questions including age, gender, marital status, education level, diet, the average number of times they dieted and the presence of overweight people in the family. The questions in the form were created by the authors by scanning the relevant literature.

Dutch Eating Behaviour Scale (DEBQ)

This is a 5-point Likert-type scale consisting of 33 items in total. This scale evaluates 3 sub-parameters such as emotional eating behaviours, restrictive eating behaviours and external eating behaviours. The first 10 questions of the scale measure restrictive eating behaviour, the next 13 questions measure emotional eating, and the last 10 questions measure external eating behaviour. The Cronbach's alpha value of the scale varies between 0.80 and 0.95 [14]. A validity and reliability study of this scale was conducted in our country, and it was found that the Cronbach's alpha value of the whole scale was 0.94, the sub-parameters had Cronbach's alpha values of 0.97, 0.91 and 0.90, respectively, which was found to be highly reliable [15].

Statistical analysis

For descriptive statistics, mean, standard deviation, minimum and maximum values in numerical variables, number and percentage values in categorical variables are given. In case of differences between groups, a paired comparison test was used to identify the group/groups that made the difference. Whether there is a relationship between categorical variables was examined using the chi-square test. The statistical significance level was set at $p < 0.05$. Analyses were made using IBM SPSS v. 25.

Results

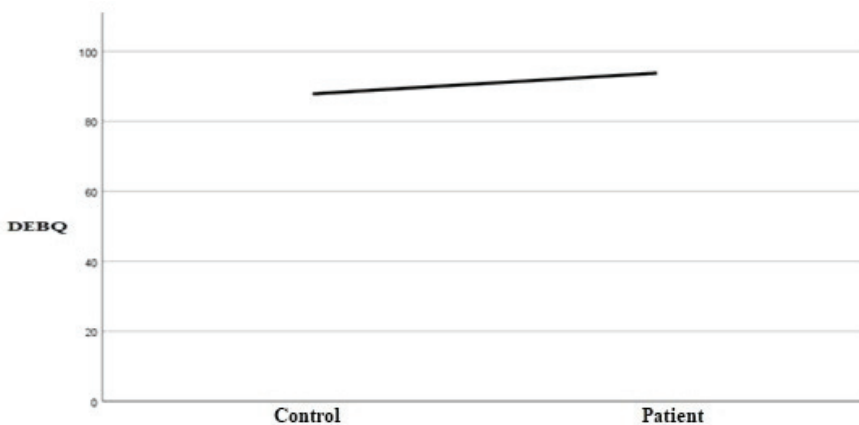
A total of 96 patients who applied to the outpatient obesity clinic were included in our study. There were 82 participants in our control group. The patient group consisted of 84 (87.5%) female and 12 (12.5%) male patients. There were 71 (86.6%) female and 11 (13.4%) male participants in the control group. The mean age of the patient group was 39.59 ± 10.80 (min: 18, max: 60), and the mean age of the control group was 35.61 ± 9.71 (min: 19, max: 59). While the mean BMI was 31.56 ± 5.67 in the patient group, it was 29.01 ± 2.75 in the control group. There was no significant difference between the two groups in terms of BMI ($p = 0.251$). In addition, there was no significant difference between the two groups in terms of gender and age ($p = 0.154$, $p = 0.286$). The socio-demographic characteristics of the patient group and the control group are shown in Table 1.

Table 1. Socio-demographic characteristics of the participants in patient and control groups

			<i>n</i>	%
Marital status	patient group	single	24	25.0
		married	72	75.0
	control group	single	46	56.1
		married	36	43.9
Education level	patient group	primary school	45	46.9
		middle school	6	6.3
		high school	9	9.4
		university	36	37.5
	control group	middle school	13	15.9
		high school	46	56.1
university		23	28.0	

Table 1. Socio-demographic characteristics of the participants in patient and control groups

			<i>n</i>	%
Income status	patient group	low	15	15.6
		middle	60	62.5
		high	21	21.9
	control group	middle	72	87.8
		high	10	12.2
Additional disease	patient group	no	45	46.9
		yes	51	53.1
	control group	no	59	72.0
		yes	23	28.0
Did you go on a diet?	patient group	no	36	37.5
		yes	60	62.5
	control group	no	49	59.8
		yes	33	40.2
How many times have you been on a diet?	patient group	never	36	37.5
		once	30	31.3
		3 times or more	30	31.3
	control group	never	49	59.8
		once	20	24.4
3 times or more		13	15.9	
Obesity in the family	patient group	no	30	31.3
		yes	66	68.8
	control group	no	46	56.1
		yes	36	43.9

**Figure 1.** Evaluation of Dutch Eating Behaviour Scale (DEBQ) scores of the patient and control groups

When the DEBQ scores of the patient group and the control group were compared, a statistically significant relationship was found ($p = 0.008$). When emotional eating behaviour, restrictive eating behaviour and external eating behaviour were evaluated between the patient and the control group, a significant relationship was found in both groups ($p = 0.000$, $p = 0.000$, $p = 0.001$). The total DEBQ scores and sub-parameters of the dieting individuals were higher than the control group. Emotional eating behaviour was found to be higher in the patient group than in the control group (Figure 1).

When the pre-diet and post-diet DEBQ total scores of patients on a diet were compared, a significant correlation was found ($p = 0.040$). When emotional eating behaviours, restrictive eating behaviours and external eating behaviours were evaluated before and after the diet, a statistically significant relationship was found ($p = 0.000$, $p = 0.000$, $p = 0.001$). It was observed that the total DEBQ scale scores and emotional eating behaviours of dieting individuals decreased in the post-diet

period compared to the pre-diet period. The mean standard deviations of the scores taken from the DEBQ scale and its sub-parameters are shown in Table 2.

In the comparison between genders, a statistically significant relationship was found in restrictive eating behaviour before and after the diet ($p = 0.028$). It was observed that restrictive eating behaviour was more common in women than in men. When the differences between genders in emotional eating and external eating behaviours were evaluated, no statistically significant relationship was found ($p = 0.762$, $p = 0.294$) (Table 3).

When marital status and restrictive eating behaviours were evaluated, a statistically significant relationship was found ($p = 0.005$). It was observed that restrictive eating behaviour in single individuals was higher than in married individuals. When marital status and emotional eating behaviour and external eating behaviour were evaluated, no significant relationship was found ($p = 0.482$, $p = 0.813$) (Table 3).

Table 2. Mean standard deviations and statistical evaluation of the Dutch Eating Behaviour Scale (DEBQ) and sub-parameter scores of the patient and control groups and effect size (95% CI Lower-Upper) values of significant statistical data

	1 Mean ± SD	2A Mean ± SD	2B Mean ± SD	1-2A* P (95% CI Lower-Upper)	2A-2B** P (95% CI Lower-Upper)	d	r
DEBQ	87.84 ± 20.44	93.78 ± 15.10	85.19 ± 17.66	0.008 (0.770-11.551)	0.040 (2.317-3.630)	0.49	0.24
Restrictive eating	23.56 ± 5.21	33.00 ± 7.55	28.38 ± 6.46	0.000 (-5.591-1.966)	0.000 (-10.551- -6.616)	0.78	0.36
Emotional eating	30.47 ± 13.39	37.04 ± 11.57	26.03 ± 12.82	0.000 (2.144-10.686)	0.000 (6.659-14.133)	0.78	0.37
External eating	29.00 ± 8.73	33.18 ± 5.65	26.16 ± 7.43	0.001 (1.379-5.861)	0.001 (4.374-8.481)	0.94	0.43

¹ Control group; ^{2A} Patient group – before diet; ^{2B} Patient group – after diet; * independent samples-t-Test; ** paired samples-t-T-test.

Table 3. Evaluation of the Dutch Eating Behaviour Scale (DEBQ) and its sub-parameters in terms of marital status and gender differences

	Marital status	Mean ± Std. Deviation	p	Gender	Mean ± Std. Deviation	p
Restrictive eating ¹	single	27.13 ± 5.89	0.005	male	21.92 ± 5.97	0.028
	married	24.37 ± 6.85		female	24.77 ± 5.72	
Emotional eating ¹	single	36.15 ± 8.45	0.482	male	37.17 ± 14.07	0.762
	married	32.42 ± 17.21		female	36.32 ± 12.54	
External eating ¹	single	30.87 ± 7.92	0.813	male	32.75 ± 7.44	0.294
	married	31.19 ± 7.66		female	32.56 ± 5.97	
Restrictive eating ²	single	33.14 ± 8.80	0.972	male	38.50 ± 11.45	0.006
	married	33.21 ± 7.27		female	32.21 ± 6.54	
Emotional eating ²	single	24.57 ± 11.80	0.482	male	26.00 ± 11.29	0.993
	married	27.00 ± 14.41		female	26.04 ± 14.21	
External eating ²	single	26.57 ± 7.52	0.813	male	28.00 ± 12.33	0.361
	married	26.13 ± 7.59		female	25.89 ± 6.52	
DEBQ ¹	single	91.39 ± 13.44	0.818	male	87.83 ± 12.81	0.194
	married	90.73 ± 20.75		female	94.21 ± 16.16	
DEBQ ²	single	84.29 ± 15.81	0.640	male	92.50 ± 16.05	0.126
	married	86.33 ± 18.06		female	84.14 ± 17.72	
Restrictive eating ³	single	28.57 ± 6.86	0.560	male	28.54 ± 5.34	0.698
	married	27.72 ± 5.92		female	27.98 ± 7.41	
Emotional eating ³	single	28.30 ± 16.46	0.283	male	30.95 ± 15.53	0.699
	married	32.19 ± 15.77		female	29.55 ± 16.90	
External eating ³	single	28.15 ± 8.82	0.356	male	28.79 ± 9.49	0.938
	married	30.00 ± 9.08		female	28.95 ± 8.52	
DEBQ ³	single	84.89 ± 22.85	0.241	male	90.46 ± 15.76	0.192
	married	90.28 ± 16.95		female	84.45 ± 24.14	

¹ Patient group – before the diet; ² Patient group – after the diet; ³ Control group.

Table 4. Statistical evaluations between dieting status and the Dutch Eating Behaviour Scale (DEBQ) and its sub-parameters and effect size and (95% CI Lower-Upper) values of significant statistical data

	None ^a (Mean ± SD)	Once ^b (Mean ± SD)	3 time or more ^c (Mean ± SD)	a-b* p (95% CI Lower-Upper)	a-c* p (95% CI Lower-Upper)	b-c* p (95% CI Lower-Upper)	d	r
DEBQ ¹	87.42 ± 17.48	81.00 ± 24.77	95.50 ± 12.67	0.239	0.147	0.017 (-14.94-7.11)	0.74	0.35
DEBQ ²	84.50 ± 20.64	79.40 ± 15.54	94.25 ± 9.69	0.269	0.034^d (-22.24-2.74)	0.001^e (-24.63- -5.06)	0.60 ^d 1.15 ^e	0.29 ^d 0.49 ^e
Restrictive eating ¹	29.75 ± 5.88	26.30 ± 5.38	28.25 ± 3.86	0.016 (-3.84-2.21)	0.415	0.200	0.61	0.29
Emotional eating ¹	32.08 ± 18.53	26.80 ± 15.93	32.00 ± 12.24	0.224	0.986	0.317		

Table 4. Statistical evaluations between dieting status and the Dutch Eating Behaviour Scale (DEBQ) and its sub-parameters and effect size and (95% CI Lower–Upper) values of significant statistical data

	None ^a (Mean ± SD)	Once ^b (Mean ± SD)	3 time or more ^c (Mean ± SD)	a–b* <i>p</i> (95% CI Lower–Upper)	a–c* <i>p</i> (95% CI Lower–Upper)	b–c* <i>p</i> (95% CI Lower–Upper)	<i>d</i>	<i>r</i>
External eating ¹	25.58 ± 7.59	27.90 ± 10.85	35.25 ± 2.70	0.329	0.000^d (- 2.72–5.44)	0.001^e (-4.98–2.72)	1.69 ^d 0.93 ^e	0.65 ^d 0.42 ^e
Restrictive eating ²	34.25 ± 6.91	29.20 ± 7.87	33.25 ± 7.13	0.007 (1.41–8.68)	0.669	0.130	0.68	0.32
Emotional eating ²	26.25 ± 16.21	24.20 ± 12.51	30.25 ± 10.81	0.573	0.431	0.150		
External eating ²	24.00 ± 8.41	26.00 ± 8.71	30.75 ± 1.86	0.348	0.000^d (-11.71– -1.78)	0.008^e (-9.91–0.41)	1.11 ^d 0.75 ^e	0.48 ^d 0.35 ^e

* *t*-Test; ¹ Patient group – before the diet; ² Patient group – after the diet; *d* – *a*–*c*; *e* – *b*–*c*.

When the total scores of the BMI and the DEBQ scale were evaluated, no significant relationship was found ($p = 0.225$). A significant relationship was found between BMI and restrictive eating behaviour ($p = 0.006$). It was observed that restrictive eating behaviour was found more in patients with high BMI. No significant relationship was found between emotional eating behaviour and external eating behaviour and BMI ($p = 0.856$, $p = 0.770$).

When the BMI and the post-diet DEBQ scale were evaluated, no significant relationship was found ($p = 0.263$). There was no statistically significant relationship between BMI and the sub-parameters of the DEBQ scale in the post-diet period ($p = 0.161$, $p = 0.227$, $p = 0.314$).

When dieting and the total scores of the DEBQ scale were evaluated, it was found that there was a statistically significant correlation when the total DEBQ score and external eating behaviour of patients who had 3 or more diets were compared ($p = 0.001$, $p = 0.001$). It was observed that the total scores of the DEBQ scale and the external eating behaviours were higher in those who had 3 or more diets (Table 4). Individuals with higher total DEBQ scores were found to diet more.

Discussion

It has been reported that individuals with overweight and/or obesity eat more as a result of negative emotions such as depression, stress and boredom, while women with normal weight ate less or had no effect from negative emotions [16]. Different studies have shown that neither perceived stress nor depression is associated with a higher BMI in the population [17]. Unlike previous studies that evaluated perceived stress and emotional eating, some authors found no associations. It has also been reported that an observed relationship between stress and dietary intake is incomplete [16]. According to emotion regulation models, emotional eating is typically triggered by negative effects [18, 19]. On the contrary, intense positive emotions can also be associated with emotional eating [20, 21].

Under conditions of intense emotional activation, food provides an immediate escape from negative reinforcement [22, 23]. The effects of emotional pathologies, such as depression or anxiety, on emotional eating have not been fully determined in literature [24]. We did not evaluate emotional pathologies such as depression or anxiety in this study, as people react differently to emotional situations. While some individuals eat more with negative emotions, this is the opposite for some individuals. This situation has also been reported in literature. In this study, we did not evaluate emotional and stressor factors, as our aim was primarily focused on the pre- and post-diet changes. In addition, studies focused on the effects of dieting on emotional eating in individuals are also limited in literature. This shows the value of our study. However, studies evaluating emotional state can reveal the results of the same individuals on emotional eating levels before and after a diet.

In a study, it was found that individuals with high BMI have high emotional eating behaviours [25]. In a study conducted with university students, it was shown that emotional eating is high in students with high BMI, and restrictive eating behaviour is high in weak students [26].

In our study, it was observed that restrictive eating behaviours were more common in individuals with high BMI. This may be because we conducted this study on patients who applied to the outpatient diet clinic.

A study in dieters showed a decrease in the consumption of vegetables and an increase in the consumption of high-calorie foods between meals [27]. Another study found that 71% of women who diet increased their food intake [28]. In this study, it was observed that the total DEBQ scale and emotional eating behaviour decreased in the post-diet period. This shows us that personal practices are important.

In a study conducted on university students in the United States, it has been shown that perceived stress is related to emotional eating [29]. In addition, the study shows that stress causes an increase in the consumption of foods high in fat and sugar [30]. In our study, we did not evaluate the stress level of individuals on a diet. We have shown that individuals with a high number of diets have high emotional eating behaviour. We could not find any study on this subject in literature. Whether or not dieting increases stress in individuals should be shown in future studies.

When negative emotions such as “guilt” arise, individuals look for “forbidden” foods that are delicious. It has been reported that this situation is more common in women [28]. In our study, we found that restrictive eating behaviour was particularly high in women, and emotional eating was not differentiated between genders. The fact that women want to look more appealing can be effective here [31]. In addition, there is a need for large-scale studies on whether or not restrictive eating behaviour creates an urge to eat in women.

Studies have shown that we need to stimulate a person who is unable to lose weight and continues to gain weight to continue dieting. Keeping one’s weight the same is a more effective long-term goal than weight loss [6]. In our study, we see that DEBQ scores and emotional eating behaviour decreased significantly before and after a diet. This can provide weight loss in the short term. However, we observed that emotional eating behaviour increased in those who followed chronic diets. This situation may cause weight gain again. We should not forget the emotional eating behaviour of those who diet frequently.

Limitations of the study

One of the limitations of our study is that it is a single centre study. For this reason, the results of our study do not reflect the general population. Our study includes the short-term follow-up of individuals on a diet. This creates a situation that prevents us from obtaining long-term results. In addition, regular or ir-

regular physical exercise is not included in our study. How emotional and stressor factors affect the emotional eating levels of individuals before and after a diet can also be evaluated with further studies.

Conclusions

As a result, we found that emotional eating behaviours were higher in dieters than in non-dieters. Emotional eating behav-

our was found to be higher in those who diet frequently. These effects can be explained more clearly in future studies involving larger populations. Studies using different methods evaluating the emotional eating behaviours of patients are needed for obesity treatment to be effective and permanent.

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References

1. Frydrych LM, Bian G, O'Lone DE, et al. Obesity and type 2 diabetes mellitus drive immune dysfunction, infection development, and sepsis mortality. *J Leukoc Biol* 2018; 104(3): 525–534.
2. Jayedi A, Rashidy-Pour A, Khorshidi M, et al. Body mass index, abdominal adiposity, weight gain and risk of developing hypertension: a systematic review and dose – response meta-analysis of more than 2.3 million participants. *Obes Rev* 2018; 19(5): 654–667.
3. Haase CL, Lopes S, Olsen AH, et al. Weight loss and risk reduction of obesity-related outcomes in 0.5 million people: evidence from a UK primary care database. *Int J Obes (Lond)* 2021; 45(6): 1249–1258.
4. Ozdemir C, Akbas Gunes N. The effect of diet and regular exercise on psychological resilience in obese or overweight women. *Int J Clin Pract* 2021; 75(8): e14320.
5. Dobbs R, Sawers C, Thompson F, et al. Overcoming obesity: an initial economic analysis. McKinsey Global Institute; 2014. Available from URL: https://www.mckinsey.com/~media/mckinsey/business%20functions/economic%20studies%20temp/our%20insights/how%20the%20world%20could%20better%20fight%20obesity/mgi_overcoming_obesity_full_report.ashx.
6. Langeveld M, DeVries JH. The long-term effect of energy restricted diets for treating obesity. *Obesity* 2015; 23(8): 1529–1538.
7. Curry SJ, Krist AH, Owens DK, et al. Behavioral weight loss interventions to prevent obesity-related morbidity and mortality in adults: US Preventive Services Task Force recommendation statement. *JAMA* 2018; 320(11): 1163–1171.
8. Van Strien T. Causes of emotional eating and matched treatment of obesity. *Curr Diab Rep* 2018; 18(6): 1–8.
9. Reichenberger J, Schnepfer R, Arend AK, et al. Emotional eating across different eating disorders and the role of body mass, restriction, and binge eating. *Int J Eat Disord* 2021; 54(5): 773–784.
10. Frayn M, Knäuper B. Emotional eating and weight in adults: a review. *Curr Psychol* 2018; 37(4): 924–933.
11. Vantieghe S, Bautmans I, Guchtenaere AD, et al. Improved cognitive functioning in obese adolescents after a 30-week inpatient weight loss program. *Pediatr Res* 2018; 84(2): 267–271.
12. Kontinen H, Haukka A, Sarlio-Lähteenkorva S, et al. Eating styles, self-control and obesity indicators. The moderating role of obesity status and dieting history on restrained eating. *Appetite* 2009; 53(1): 131–134.
13. Péneau S, Menard E, Mejean C, et al. Sex and dieting modify the association between emotional eating and weight status. *Am J Clin Nutr* 2013; 97(6): 1307–1313.
14. Zellner DA, Loaiza S, Gonzalez Z, et al. Food selection changes under stress. *Physiol Behav* 2006; 87(4): 789–793.
15. Heatherton TF, Herman CP, Polivy J. Effects of physical threat and ego threat on eating behavior. *J Pers Soc Psychol* 1991; 60(1): 138.
16. Pickett S, McCoy TP. Effect of psychosocial factors on eating behaviors and BMI among African American women. *Clin Nurs Res* 2018; 27(8): 917–935.
17. Pickett S, Burchenal CA, Haber L, et al. Understanding and effectively addressing disparities in obesity: a systematic review of the psychological determinants of emotional eating behaviours among Black women. *Obes Rev* 2020; 21(6): e13010.
18. Haedt-Matt AA, Keel PK. Revisiting the affect regulation model of binge eating: a meta-analysis of studies using ecological momentary assessment. *Psychol Bull* 2011; 137(4): 660–681.
19. Bemanian M, Mæland S, Blomhoff R, et al. Emotional eating in relation to worries and psychological distress amid the COVID-19 pandemic: a population-based survey on adults in Norway. *Int J Environ Res Public Health* 2021; 18(1): 130.
20. Safer DL, Telch CF, Chen EY. *Dialectical behavior therapy for binge eating and bulimia*. New York: Guilford Press; 2009.
21. Lock J. An update on evidence based psychosocial interventions for children and adolescents with eating disorders. *J Clin Child Adolesc Psychol* 2015; 44: 707–721.
22. Leehr EJ, Krohmer K, Schag K, et al. Emotion regulation model in binge eating disorder and obesity – a systematic review. *Neurosci Biobehav Rev* 2015; 49: 125–134.
23. Braden A, O'Brien W. Pilot study of a treatment using Dialectical Behavioral Therapy skills for adults with overweight/obesity and emotional eating. *Journal of Contemporary Psychotherapy* 2021; 51(1): 21–29.
24. Fernandes J, Ferreira-Santos F, Miller K, et al. Emotional processing in obesity: a systematic review and exploratory meta-analysis. *Obes Rev* 2018; 19(1): 111–120.
25. Verzijl CL, Ahlich E, Schlauch RC, et al. The role of craving in emotional and uncontrolled eating. *Appetite* 2018; 123: 146–151.
26. Taş E, Kabaran S. Sezgisel Yeme, Duygusal Yeme ve Depresyon: Antropometrik Ölçümler Üzerinde Etkileri Var Mi. *Sağlık ve Toplum* 2020; 20: 127–139 (in Turkish).
27. Snoek HM, Engels RC, Janssens JM, et al. Parental behaviour and adolescents' emotional eating. *Appetite* 2007; 49(1): 223–230.
28. Strien T, van, Zwaluw CS, van der, Engels RC. Emotional eating in adolescents: a gene (SLC6A4/5-HTT) – Depressive feelings interaction analysis. *J Psychiatr Res* 2010; 44(15): 1035–1042.
29. Ling J, Zahry NR. Relationships among perceived stress, emotional eating, and dietary intake in college students: eating self-regulation as a mediator. *Appetite* 2021; 163: 105215.
30. Stammers L, Wong L, Brown R, et al. Identifying stress-related eating in behavioural research: A review. *Horm Behav* 2020; 124: 104752.
31. Rompkovski CS, Lourenço ML, Balbi ME, et al. Reasons that lead women to weight loss: a study in southern Brazil. *Revista Psicologia e Saúde* 2021; 13(1): 81–96.

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