ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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Determining the Relationship Between Test Anxiety and Nutrition in High School 3rd and 4th Grade: A Case of Anatolian High School

Lise 3. ve 4. Sınıf Öğrencilerinde Sınav Kaygısı ve Beslenme Durumu Arasındaki İlişkinin Saptanması: Bir Anadolu Lisesi Örneği

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ABSTRACT Objective: This study was carried out to evaluate the body mass index (BMI) and emotional eating increasing with test stress in students in high school 3rd and 4th grade. **Material and Methods:** The study was carried out on 117 students studying in the 3rd and 4th grades at an Anatolian high school in Istanbul. The Revised Test Anxiety Scale, which determines the level of test anxiety of students, and the Turkish Emotional Eating Scale, which questions the demographic information and emotional nutritional status, were applied. **Results:** Of the 117 students who participated in the study, 51 were 3rd grade and 66 were 4th grade. While there was a statistically positive relationship between test anxiety and emotional eating, there was no statistical relationship between test anxiety and emotional eating and BMI. Given gender, female students showed more test anxiety and emotional eating behavior than boys; however, male students' mean BMI was higher than female students. Considering the class, emotional eating and test anxiety were higher in high school 4th grade, whereas high BMI was more common in high school 3rd grade. **Conclusion:** To prevent the emotional eating behaviors of high school 3rd and 4th grade, test anxiety should be at the desired level. Thus, dieting beside therapy was necessary for physical development and school success. More studies are required to determine the effect of emotional food associated with test anxiety on BMI.

Keywords: Adolescent; nutritional status; feeding behavior; anxiety

ÖZET Amaç: Bu çalışma, lise 3. ve 4. sınıf öğrencilerinde sınav kaygısıyla artan duygusal yeme ve beden kitle indeks (BKİ)lerini değerlendirmek amacıyla yapılmıştır. **Gereç ve Yöntemler:** Çalışma, İstanbul ilinde yer alan bir Anadolu lisesinde 3.ve 4. sınıfta okuyan 117 öğrenci üzerinde gerçekleştirilmiştir. Öğrencilerin sınav kaygı düzeyini belirleyen Revize Edilmiş Sınav Kaygısı Ölçeği ve demografik bilgileri ile duygusal beslenme durumlarını sorgulayan Türkçe Duygusal Yeme Ölçeği uygulanmıştır. **Bulgular:** Çalışmaya katılan, 117 öğrenciden 51 kişi lise 3.sınıf, 66 kişi lise 4.sınıf öğrencisidir. Sınav kaygısı ile duygusal yeme arasında istatistiksel olarak pozitif bir ilişki bulunurken sınav kaygısı ve duygusal yeme ile BKİ arasındaki ilişki istatistiksel olarak anlamsız bulunmuştur. Cinsiyet göz önüne alındığında, kız öğrenciler erkeklerden daha fazla sınav kaygısı ve duygusal yeme davranışı gösterdi ancak erkek öğrencilerin BKİ'si kız öğrencilerinkinden daha yüksekti. Sınıf bazında, duygusal yeme ve sınav kaygısı lise 4. sınıf öğrencilerinde daha yüksek iken yüksek BKİ lise 3. sınıf öğrencilerinde daha yaygındır. **Sonuç:** Lise 3. ve 4. sınıfların duygusal yeme davranışlarını önlemek için sınav kaygısı istenilen düzeyde olmalıdır. Bu nedenle, fiziksel gelişim ve okul başarısı için terapinin yanı sıra diyet yapmak gereklidir. Test kaygısı ile ilişkili duygusal yeme davranışının BKİ üzerindeki etkisini belirlemek için daha fazla çalışmaya ihtiyaç vardır.

Anahtar Kelimeler: Ergen; beslenme durumu; beslenme davranışı; kaygı

According to the definition of World Health Organization (WHO), health is the individual's being in a state of mental, physical and social well-being.[1] In order to be healthy, nutrition is the basic condition.[2] Growth is the use of nutrients to maintain life and health.[3] In order to have a healthy nutrition process, it should be known how much to eat from food, sensitivities to food, as well as the effects of economic, psychological and sociological factors in nutrition and how to deal with these effects.[2]

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In order for individuals to be specific to their lives while performing healthy eating behaviors, it is necessary to investigate the reasons that affect food selection and consumption. Individuals are influenced by the relationship of many factors such as genetic, physiological, psychological and socio-cultural factors when choosing and consuming food. Eating process includes various individual differences such as physical condition, culture, media, body perception, appetite, lifestyle and emotional needs.[4]

It is necessary to mention that emotions are reflected in behaviors, given the emotional needs factor in the eating process.[5] According to the escape theory, which is one of the theories of emotions and eating behavior, emotional overeating is an escape from negative emotions for people.[6]

EMOTIONAL EATING

Emotional eating means eating to meet your emotional need, it is a product of an effort to reduce the distress caused by negative emotions and is generally seen in overweight/obesity and normal weight people.[7-9] There is clear evidence that there is no reduction in stress during or after eating. These individuals look for prohibited foods such as post-consumer guilt or may cause even more negative emotions and become a vicious circle. Emotional eating behavior is more common in women, people with low weight control, and overweight or obese individuals than normal weight individuals.[8,10,11] Thus emotional eating is a risk factor for obesity and obesity is a consequence of bad eating habits.[6,12] Studies have shown that obesity increases the risk of chronic diseases such as type 2 diabetes mellitus, hypertension, diseases of the cardiovascular system.[13] Studies in recent years show that the prevalence of obesity has increased significantly in the adolescent period.[14]

Refined food, sugary drinks, fried food, processed meat, refined grains and high fat intake, biscuit appetizers and pastries consumption are associated with the risk of depression. On the other hand, healthy foods such as fruit, vegetables, olive oil, fish, are inversely related to the risk of depression.[15] Generally, nutritional physiological changes are thought to help regulate mood. Another physiological mechanisms that are thought to regulate the emotional state are carbohydrate-rich foods, the increase of serotonin of protein, the increase of hydrolyzed protein, tryptophan and the increase of cortisol levels, and high-fat foods cause mood improvements.[16-23]

In moments of emotional eating, emotional loss of control occurs. Therefore, at the time of emotional eating, individuals are not aware of how much they can eat. As the awareness level increases, overeating behavior decreases.[11] Successful interventions for long-term weight management should have a two-way approach: reducing chronic stress levels, as well as changing the individual's response to stress, and the negative emotions triggered.[24] Evaluating the advantages and disadvantages of emotional eating is another solution to emotional eating. In addition, as a result of self-observation, the individual identifies what emotional eating is and determines which technique is easier when trying to achieve the goal of reducing emotional eating, identifying activities that stimulate eating behavior (such as snack while watching TV) or correcting classical eating behavior (triggering loneliness and eating behavior), activities such as sports, reading a magazine etc., maintaining the recommended diet program, acquiring new healthy habits.[25,26] It should be emphasized that food should never be seen as a way to reduce stress or become a more pleasant mood. Food and exercise diaries should be kept with cognitive behavioral therapy techniques. The most important solution is to be able to understand the psychological vicious cycles of dietitian's clients and transfer them to their clients.[26]

TEST ANXIETY

An age group in which emotional eating caused by stress is effective is high school 3rd and 4th grade. These students are between the ages of 16-18. According to the WHO, the adolescent period is between 10-19 years old. Stress, which affects individuals' behavior and relationships with other people, can manifest itself as test stress in adolescents and may affect their eating behavior.[27]

Emotional eating should not be ignored for a better understanding of the relationship between stress and obesity in adolescents.[28] As seen in many studies on the nutrition of adolescents and related health

problems; adolescent period, which has an important place in childhood in determining the nutrition and health status of adults; is a period that should be emphasized carefully in terms of growth and development. The health problems that may occur in this period can be transported to adulthood, and the nutritional pattern established in the adolescent period can continue in adulthood.[29] For this reason, it is very important for individuals to have proper eating habits. However, it has been revealed in the researches that adolescents, who are among the nutritionally sensitive and risky groups, have irregular diet patterns and skipped meals. In the studies conducted in our country, adolescents are shown to miss meals and have risky eating habits. It is also stated that nutrients, which are very important for health, such as iron and calcium, are inadequate in adolescents.[30]

When emotional eating was analyzed among culturally diverse examples of children and adolescents, the results showed that approximately 10% to 60% of young people emotionally eat.[28]

Stress is a physical, emotional, cognitive and behavioral response to events that are seen as threatening or challenging. Anxiety is one of the symptoms of stress.[5] The most intense anxiety periods in adolescents are test periods. Test anxiety is defined as a fear that leads to poor performance in tests and assessment skills. At this point, test anxiety is a special kind of anxiety and a mixed feeling of restlessness that is felt with fear when evaluating the individual. Test anxiety, which is very common in students, is a serious problem that continues before the test with physical and psychological changes, negatively affects the performance and academic success during the test and prevents them from revealing their full potential.[31]

Nutrition has effects on physical, cognitive and sensory development. In addition, inadequate and unbalanced nutrition negatively affects students' attention, learning and school success.[32]

This research was carried out in order to evaluate the relationship between body mass index (BMI) values, test anxiety and nutritional status of 3rd and 4th grade of high school.

MATERIAL AND METHODS

UNIVERSE AND TYPE OF RESEARCH

The universe of research was the 3rd and 4th grade (11th-12th grade), who were educated at a high school among the high schools affiliated to the Ministry of National Education in Çekmeköy district of Istanbul province. This research has been carried out as a descriptive and cross-sectional type.

PLACE, TIME AND SAMPLE SELECTION OF RESEARCH

After the ethics committee approval had been obtained from İstanbul Okan University (date: 22.01.2020/number: 118), the research was carried out with the 3rd and 4th grade (11th-12th grade) students of a high school affiliated to the Ministry of National Education in the Çekmeköy district of İstanbul Province within the 6 months following ethics committee approval.

The sample of research consists of 117 students who were in the 3rd and 4th grade (11th-12th grade) in this high school. In the study, it was predicted that emotional eating might increase with test stress. High school 3rd and 4th grades were included in the study group. Out of 117 students 51 are from high school 3rd grade and 66 students are from 4th grade.

DATA COLLECTION

A total of 50 questions and 2 main parts were prepared using the literature and similar studies to determine the test anxiety level and emotional nutritional status of the students participating in the study, and also to reveal the relationship between test anxiety and emotional nutrition, and to determine the relationship between test anxiety and emotional eating and obesity as a result of the BMI values of the students. A questionnaire with validity-reliability study was used. In the first part of the questionnaire, the Revised Test Anxiety Scale was applied.[33] In this section, the test anxiety level of the participants was determined by measuring factors such as tension, physical symptoms, anxiety, thoughts unrelated to the test. In the second part, the Turkish Emotional Eating Scale was applied, and the level of emotional eating was determined through eating, self-control, and

control factors against stimulation in addition to gender, physical knowledge and age criteria.[34]

The students voluntarily participated in the study and their consent was obtained. A parental consent form prepared by İstanbul Okan University was collected from the families of students those under the age of 18 that they voluntarily accepted to work after being informed. Ethics committee approval was obtained for the research from Istanbul Okan University and permission was obtained from the director of the high school where the study was conducted. The participants were informed about the study protocol. In addition, the study was carried out in accordance with the Helsinki Declaration principles.

STATISTICAL ANALYSIS

For the evaluation of the anthropometric measurements of adolescents, WHO 2007 values were taken as reference.[27] IBM SPSS (Statistical Package for the Social Sciences) Statistics 25 program was used to analyze the data. The values of students' demographic information and reflection of test anxiety on eating behavior are given as a percentage. In the study, the relationship between test anxiety and nutritional status and obesity were examined separately in high school 3rd grade and 4th grade. Histogram, variation coefficient, skewness / kurtosis, detrended Q-Q plot, Kolmogorov Smirnov test were used to determine the normality distribution and according to this test, the distribution was found as normal. ANOVA test was used while determining the distribution homogeneity of test anxiety and emotional eating, which are dependent variables, by gender, class and BMI factors, which are independent variables. Homogeneity hypothesis was accepted acoording to this test. While the Pearson correlation method was used for the relationship between the test anxiety and emotional nutrition of the students and the relationship between these factors and the BMI, cross tables were used to compare emotional eating behavior, test anxiety and BMI factors by gender and class. Descriptive data were shown as mean and standard deviation (X±SD). For the Revised Test Anxiety Scale in the first part of the questionnaire, it was interpreted that if students scored 35 and above, there was test anxiety. For the Turkish Emotional Eating Questionnaire in the second part of the questionnaire, if the students scored 75 and above, they were interpreted to have emotional eating. The results were evaluated at a 99% confidence interval at a probability (p) <0.01 significance level.

RESULTS

A total of 117 students from high school 3rd and 4th grades were included in the study. Out of 117 students, 53 (43.6%) were female and 64 (56.4%) were male (Table 1). Relationships between emotional eating, test anxiety, and BMI were evaluated separately based on gender and class factor and BMI related to emotional eating and test anxiety was found to be related to gender.

In terms of BMI values, 49 (41.88%) female and 48 (41.03%) male students had normal BMI, 3 (2.56%) female and 14 (11.97%) male students were overweight, 1 (0.85%) female and 2 (1.71%) male students were obese. Table 2 shows the mean and SD of BMI, Revised Test Anxiety Scale and Turkish Emotional Eating Scale based on class, gender and total participant. BMI values of male students were higher than those of females, but emotional eating scores and test anxiety scores were higher in females. The mean BMI of the 3rd grades was higher than the 4th grades and the emotional eating scores and test anxiety scores of the 4th grades were higher than the 3rd grades.

When Table 3 was examined, a statistically significant correlation value between emotional eating and test anxiety was obtained as 0.408 (p<0.01). This correlation value showed the positive weak relationship between these two variables and the existence of a significant relationship. When considered in the context of co-change, emotional eating increased as

TABLE 1: Demographic information general table.

		Woman		Man	
Variables	**Groups**	**n**	**%**	**n**	**%**
Class	High school 3rd grade	20	17.09	31	26.50
	High school 4th grade	33	28.21	33	28.21
BMI	Normal	49	41.88	48	41.03
	Overweight	3	2.56	14	11.97
	Obese	1	0.85	2	1.71
Total		**53**	**43.6**	**64**	**56.4**

BMI: Body mass index.

TABLE 2: Initial characteristics of the students.

Variables	Groups	BMI X±SD	Revised Test Anxiety Scale X±SD	Turkish Emotional Eating Scale X±SD
Gender	Woman	20.83±2.83	43.98±9.69	76.91±23.31
	Man	21.97±3.30	40.30±9.83	63.03±17.52
Class	3rd grade	21.77±3.52	42.18±9.80	68.78±21.15
	4th grade	21.20±2.79	41.97±10.07	69.73±21.76
	Total Participant	21.45±3.13	42.05±9.91	69.32±21.41

BMI: Body mass index; SD: Standart deviation.

TABLE 3: The relationship between test anxiety and emotional eating (n:117).

	Test anxiety	Emotional eating	p value
Test anxiety	1	0.408*	0.408
Emotional eating	0.408*	1	0.408

Statistical method: Pearson Correlation, p: Pearson correlation statistical significance level; *statistical significance p<0.01.

TABLE 4: The relationship between exam anxiety and emotional eating and BMI (n:117).

	Test anxiety	Emotional eating	BMI	p value
Test anxiety	1	0.408**	0.007	0.007
Emotional eating	0.408**	1	0.114	0.114
BMI	0.007	0.114	1	

BMI: Body mass index.

test anxiety increased and emotional eating decreased as test anxiety decreased.

When Table 4 was examined, the correlation value 0.007 was found between test anxiety and BMI and 0.114 between emotional eating and BMI. These correlation values represented the relationship between these variables but, the relationship was not statistically significant (p>0.01).

While interpreting the Turkish Emotional Nutrition questionnaire, students were interpreted as having emotional eating if they scored 75 and above. Accordingly, the data obtained from the Turkish Emotional Eating questionnaire were evaluated statistically and the relationship between emotional eating and gender was interpreted in Table 5.

According to Table 5, female students having emotional eating behavior accounted for 25 (21.4%) of the total number of students, while emotional eating male students corresponded to 14 (12%) of the total number of students. As a result, it can be said that female students had more emotional eating behaviors than male students.

According to the Revised Test Anxiety Scale, the students having 35 or above points from the test was considered having test anxiety (Table 6).

TABLE 5: Percentage distributions of emotional eating behavior according to students' gender.

		Emotional eating		
Gender		No	Yes	Total
Woman	Count	28	25	53
	% within Gender	52.80%	47.20%	100.00%
	% within Emotional Eating	35.90%	64.10%	45.30%
	% of Total	23.90%	21.40%	45.30%
Man	Count	50	14	64
	% within Gender	78.10%	21.90%	100.00%
	% within Emotional Eating	64.10%	35.90%	54.70%
	% of Total	42.70%	12.00%	54.70%
Total	Count	78	39	117
	% within Gender	66.70%	33.30%	100.00%
	% within Emotional Eating	100.00%	100.00%	100.00%
	% of Total	66.70%	33.30%	100.00%

TABLE 6: Percentage distributions of test anxiety according to students' gender.

Gender		Test anxiety		
		No	Yes	Total
Woman	Count	9	44	53
	% within Gender	17.00%	83.00%	100.00%
	% within Test Anxiety	27.30%	52.40%	45.30%
	% of Total	7.70%	37.60%	45.30%
Man	Count	24	40	64
	% within Gender	37.50%	62.50%	100.00%
	% within Test Anxiety	72.70%	47.60%	54.70%
	% of Total	20.50%	34.20%	54.70%
Total	Count	33	84	117
	% within Gender	28.20%	71.80%	100.00%
	% within Test Anxiety	100.00%	100.00%	100.00%
	% of Total	28.20%	71.80%	100.00%

According to Table 6, female students with test anxiety correspond to 83% of the total number of female students and 52.4% of the total individuals with test anxiety. Students with test anxiety made up 62.5% of total male students and 47.6% of those with total test anxiety. According to these data, female students had more test anxiety than male students.

When Table 7 is examined, while those who have normal BMI among female students constitute 49 (41.9%) of the total number of students, those with normal BMI among male students correspond to 48 (41%) out of total students. Overweight girls make up 3 (2.6%) out of the total number of students, while overweight men account for 14 (12%) out of the total students. The number of obese female students constitutes 1 (0.92%) out of total students and obese male students constitute 2 (1.7%) out of total students. It was concluded that male students had higher BMI than female students.

When Tables 5, 6 and 7 were analyzed together, it was concluded that female students had more test anxiety and emotional eating behavior than male students, but male students had more BMI than female students.

When Table 8 was analyzed, among the 3rd grade, students who showed emotional eating behavior constitute 17 (14.5%) out of the total number of students; among the high school 4th grade, students

TABLE 7: Percentage distributions of BMI according to students' gender.

Gender		BMI			
		Normal	Overweight	Obese	Total
Woman	Count	49	3	1	53
	% within Gender	92.50%	5.70%	1.90%	100.00%
	% within BMI	50.50%	17.60%	33.30%	45.30%
	% of Total	41.90%	2.60%	0.90%	45.30%
Man	Count	48	14		64
	% within Gender	75.00%	21.90%	3.10%	100.00%
	% within BMI	49.50%	82.40%	66.70%	54.70%
	% of Total	41.00%	12.00%	1.70%	54.70%
Total	Count	97	17	3	117
	% within Gender	82.90%	14.50%	2.60%	100.00%
	% within BMI	100.00%	100.00%	100.00%	100.00%
	% of Total	82.90%	14.50%	2.60%	100.00%

BMI: Body mass index.

TABLE 8: Percentage distributions of emotional eating behavior according to students' class.

Class		Emotional eating		
		No	Yes	Total
High school, 3rd grade	Count	34	17	51
	% within Class	66.70%	33.30%	100.00%
	% within Emotional eating	43.60%	43.60%	43.60%
	% of Total	29.10%	14.50%	43.60%
High school, 4th grade	Count	44	22	66
	% within Class	66.70%	33.30%	100.00%
	% within Emotional eating	56.40%	56.40%	56.40%
	% of Total	37.60%	8.80%	56.40%
Total	Count	78	39	117
	% within Class	66.70%	33.30%	100.00%
	% within Emotional eating	100.00%	100.00%	100.00%
	% of Total	66.70%	33.30%	100.00%

TABLE 9: Percentage distributions of test anxiety according to students' class.

Class		Test anxiety		
		No	Yes	Total
High school, 3rd grade	Count	14	37	51
	% within Class	27.50%	72.50%	100.00%
	% within Emotional Eating	42.40%	44.00%	43.60%
	% of Total	12.00%	31.60%	43.60%
High school, 4th grade	Count	19	47	66
	% within Class	28.80%	71.20%	100.00%
	% within Emotional Eating	57.60%	56.00%	56.40%
	% of Total	16.20%	40.20%	56.40%
Total	Count	33	84	117
	% within Class	28.20%	71.80%	100.00%
	% within Emotional Eating	100.00%	100.00%	100.00%
	% of Total	28.20%	71.80%	100.00%

with emotional eating accounted for 22 (18.8%) out of the total number of students. According to these results, it can be said that high school 4th grade students showed more emotional eating behavior than high school 3rd grade.

When Table 9 was analyzed, 37 (31.6%) students of high school 3rd grade and 47 (40.2%) high school 4th grade students had test anxiety. As a result, it was found that high school 4th grade had more test anxiety than high school 3rd grade.

Looking at Table 10, among 3rd grade, there were 40 (34.1%) students having normal BMI, 9 (7.6%) students being overweight and 2 (1.7%) students with obesity. There are 57 (48.7%) students who were normal, 8 (6.8%) students were overweight and 1 (0.85%) student was obese in the 4th grade. As a result, it could be said that the BMI of high school 3rd grade was higher than the BMI of 4th grade.

When Table 8, Table 9 and Table 10 were examined together, test anxiety and emotional eating behaviors of high school 4th grade were higher than 3rd grade, but high school 3rd grade had higher BMI than 4th grade.

DISCUSSION

The study was carried out to determine the relationship between test anxiety and emotional eating of high school 3rd and 4th grade, as well as to evaluate the relationship between emotional eating and BMI related to test anxiety. The important parameters in this study were gender and the grade. Statistical relations between emotional eating, test anxiety, and BMI were evaluated using these two parameters.

TABLE 10: Percentage distributions of BMI according to students' class.

Class		BMI			
	Normal	Overweight	Obese	Total	
High school, 3rd grade	Count	40	9	2	51
	% within Class	78.40%	17.60%	3.90%	100.00%
	% within BMI	41.20%	52.90%	66.70%	43.60%
	% of Total	34.20%	7.70%	1.70%	43.60%
High school, 4th grade	Count	57	8	1	66
	% within Class	86.40%	12.10%	1.50%	100.00%
	% within BMI	58.80%	47.10%	33.30%	56.40%
	% of Total	48.70%	6.80%	0.90%	54.70%
Total	Count	97	17	3	117
	% within Class	82.90%	14.50%	2.60%	100.00%
	% within BMI	100.00%	100.00%	100.00%	100.00%
	% of Total	82.90%	14.50%	2.60%	100.00%

Researches have investigated how different emotional states affect individuals' eating behaviors in eating processes. Although there are differences among individuals, it was found that negative emotions such as stress, anxiety, depression increase food consumption and disrupt their eating habits. It has been determined that stressed people turn to sweets and fatty foods with more calorie content.[1] In previous studies, it has been found that individuals with overweight and obesity consume more food than normal-weight individuals during negative emotional attacks due to mood.[9] In contrast to this situation, in a study conducted with high school students, a statistically insignificant relationship was found between emotional eating and BMI (Table 4).

Since emotional eating appears to occur frequently before adulthood, identifying the ongoing factors of emotional eating in young people can help identify prevention methods. Therefore, emotional eating work is necessary for the formative years of adolescence. Belcher et al. found that concerns about self-image, relationships and school significantly predicted emotional eating in Latina female.[35] This study reported that emotional nutrition significantly altered the relationship between basic concerns in follow-up and BMI percentile.[28]

A study by Belcher et al. showed that worries significantly predict emotional eating in adolescents; the results in the current study are similar but specific to school-related concerns.[35] The relationship between academic self-esteem and emotional eating is negative, according to the study in which emotional eating increases with increasing academic anxiety; emotional eating decreased as academic self-esteem increased.[28] In this study, finding a positive relationship between emotional eating and test anxiety parallels this information in the literature. However, those with a higher grade had higher scores on emotional eating (Table 3, Table 8). One possible explanation for this outcome may be that individuals who maintain high grades, dedicated to school work, may have high levels of stress and going towards emotional food to deal with the pressure to take and maintain high grades.[28] The results of Kim et al. indirectly supported this idea because they found high school students having higher academic stress ate larger portions and more sugar than academically less stressed ones.[36] Similarly, the positive relationship between emotional eating and test anxiety was obtained in this study (Table 3). In another study, Martyn Nemeth et al. found that those with higher self-esteem reported less unhealthy eating behaviors and used less avoidance coping behaviors than adolescents with low self-esteem.[37]

The perceived stress was a significant correlation of emotional eating regardless of the BMI status, as well as the BMI status did not have a modifying effect. The scientific studies emphasize that emotional eating is not only a problem for overweight and obese people.[28] In this study, considering the gender factor, female students have more emotional eating and test

anxiety than male students (Table 5, Table 6), although men have more BMI than women (Table 7), and BMI is independent of emotional eating. When evaluated according to the class factor, although emotional eating and test anxiety in high school 4th grade are higher than high school 3rd grade (Table 8, Table 9), the higher BMI of high school 3rd grade (Table 10) makes it independent from eating emotionally. This study shows that some children with high risk of obesity and associated chronic disease in this population already include emotional eating as a learned response to stress when they enter puberty. One of the main hypotheses tested for the Individual Differences Model is that obese individuals are more likely to undergo stress-induced food than the normal-weight individuals.[28] Michaud et al. concluded that stress increases food intake in one example of French high school students, and this behavior may increase body weight over time.[38]

Students who reported high academic stress in high school students in Korea ate more food and consumed more sugar than those who reported low academic stress.[28] In this study conducted in high school students, a significant and positive relationship was found between emotional eating and test anxiety (Table 3).

The results of Wardle et al.'s study in the British adolescent showed that perceived obesity was associated with emotional eating.[39] A study on overeating and obesity found that emotional eating was positively associated with overeating and overeating predicted obesity but the negative effect alone was not associated with BMI.[40]

In another study examining the relationship between stress and emotional eating, Tan and Chow revealed the contribution of eating dysregulation to the relationship between stress and emotional eating.[41] Research shows that individuals experiencing high levels of stress have very low ability to regulate their eating behavior. This lack of skills in regulating eating behavior is directly related to emotional eating.

Wallis and Hetherington showed that both individuals with high emotional eating scores and individuals with highly restrictive eating scores ate more in the face of a stressor that created a self-threatening.[10,42]

In a study examining the relationship between gender and emotional eating, women constantly eat more moderately, higher levels of food craving, and more uncontrolled eating events and it was emphasized that more emotional eating behaviors were shown than men.[43-46] Women show more eating disorders than men. Emotional nutrition and treatments to reduce eating more may benefit from focusing on non-gender-specific processes.[9] This is consistent with the findings of Bennett, Greene, and Schwartz Barcott who found that guilt was particularly associated with emotional eating in women. Similar results were obtained in this study.[47] Female students have more emotional eating than male students (Table 5) and test anxiety is also more in female students (Table 6). However, BMI was found more in male students (Table 7). Test anxiety and emotional eating seem to have no effect on BMI.

Işgın et al. evaluated the relationship between emotional eating, uncontrolled eating, and cognitive eating restriction behaviors and body composition in adolescents.[14] Accordingly, they didn't find any significant relationship between emotional eating and BMI and drew attention to the effect of cognitive eating restriction on eating behavior of adolescents.[14]

Teaching young people about healthy alternatives for managing negative emotions can help reduce incompatible coping behaviors. Also, it is unknown how parents and school/school leaders are aware of the frequency of emotional eating among adolescents. Further research should try to identify emotional eating awareness among parents and school leaders (counselors, teachers and managers) and to identify strategies that these key players can use to effectively reduce the risk of emotional eating.[28]

As a result, in this study, there was a positive relationship between emotional eating and test anxiety (Table 3), but the relationship between BMI and emotional eating and test anxiety was not statistically important (Table 4). Emotional eating and test anxiety was more common in women than in men (Table 5, Table 6). BMI was higher in males than in females (Table 7). Emotional eating and test anxiety was

higher in high school 4th grade than high school 3rd grade (Table 8, Table 9), and high school 3rd grade had more BMI than high school 4th grade (Table 10). Most of the information obtained from this study with high school 3rd and 4th grade were similar to previous studies in the literature. Similar to the results obtained with the information in the literature, it can be said that there is a statistically positive relationship between emotional eating and test anxiety, female students have more emotional eating than male students and BMI is independent of emotional eating and test anxiety.

It is among the limitations of the study that there are students who do not come on the day of the study and some of the students did not complete all the questions in the questionnaire. These students are not included in the study.

CONCLUSION

The current literature shows the relationship between stress and emotional eating in adults, but limited research has examined the effect of school-related stress on emotional eating in adolescents.[28] In this study, although it was concluded that emotional eating and test anxiety existed in high school 3rd and 4th grade, the number of obese individuals was lower than the individuals with normal BMI (Table 2). The emotional eating and test anxiety scores were higher in females (Table 5, Table 6). Also, emotional eating and test anxiety were found higher in high school 4th grade than in high school 3rd grade (Table 8, Table 9). Men had higher BMI than women and students of high school 3rd grade have more BMI than 4th grade (Table 7, Table 10).

Increase in the test anxiety behavior and consequently increase in emotional eating were observed in students of 3rd and 4th grade. Training should be organized for students' families about test anxiety and emotional eating. It is important for high school 3rd and 4th grade who have test stress to gain a good eating habit, and a diet that includes energy and nutrients at an adequate level for both their development and school success. Understanding the behavioral issues related to obesity will provide an important idea in determining the ways of action to reduce child obesity rates.[48] Therapies that include emotional regulation strategies and teach how to use healthier coping mechanisms such as social support and personal care when experience negative emotions, can be applied to emotional eaters.[8] Acceptance and Commitment Therapy is one of these therapies, which includes awareness, value, and acceptance-based practices.[49] The Dialectical Behavior Therapy approach which aims to cope with stress and provides psychological flexibility to help increase distress tolerance in emotional eaters, is another therapy that should be applied.[50] In addition, the results suggest that encouraging exercise can be beneficial for emotional eaters in terms of both weight regulation and stress reduction.[8] Treatment of behavioral change, as well as diet and exercise, increase the success rate of obese individuals towards achieving the desired weight loss and maintaining the lost weight.[25] More studies are needed to determine the impact of students' test anxiety and emotional eating on BMI.

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Conflict of Interest

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

Authorship Contributions

All authors contributed equally while this study preparing.

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