

# THE EFFECT OF ANXIETY EXPERIENCED IN UNIVERSITY STUDENTS DUE TO COVID-19 PANDEMIC UPON EMOTIONAL EATING

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## ABSTRACT

**Aims:** Individuals may consume more food than normal in response to negative emotions such as anxiety or irritability. One of the eating problems in which this food is consumed is defined as emotional eating, and emotional eating is an eating disorder that describes the tendency to overeat in response to negative emotions. The study was carried out to analyze the effect of anxiety due to the COVID-19 pandemic upon emotional eating in university students.

**Methods:** This descriptive research was conducted in May-June 2020 with 718 students who continue their university education in Turkey, have internet access and volunteer to participate in the research. Data were collected by snowball method by sending the survey link via Whatsapp groups. Data were collected online using the Descriptive Questionnaire, the State Anxiety Scale and the Emotional Eating Scale. The participant's statement was taken as a basis for the measurement values of body weight and height. Ethical principles were observed at all stages of the study.

**Results:** Totally 718 university students including 136 (18.9%) males and 582 (81.1%) females with a mean age of  $21.51 \pm 7.08$  participated into the study. The total score average of the Emotional Eating Scale was found to be  $47.30 \pm 20.63$ . It was determined that the average score of the State-Trait Anxiety Inventory was  $40.24 \pm 5.72$ , and 46.7% of the students had low, 52.6% had medium and 0.7% had high level anxiety. A

weakly positive significant relationship was revealed between the State-Trait Anxiety Inventory score and Emotional Eating Scale score ( $r=0.160$ ,  $p<0.01$ ).

**Conclusions:** It was concluded that university students were anxious at different levels during the COVID-19 pandemic, and their anxiety affected emotional eating.

**Keywords:** Anxiety, COVID 19, eating, emotional, student.

## INTRODUCTION

COVID-19 outbreak started as a viral pandemic in Wuhan, China in December 2019 [1]. World Health Organization (WHO) declared the COVID-19 outbreak as a "pandemic" due to the increasing spread of the virus worldwide as of March 11 [2]. As of April 22, 2021, approximately 150 million people worldwide have been infected with COVID-19 and 3047322 cases resulted in death as reported [3]. The COVID-19 pandemic has become an indiscriminate health crisis affecting people of all countries, continents, races and socioeconomic classes [4].

Since the declaration of COVID-19 as a global pandemic, governments all around the world have taken strict public health measures to keep the pandemic under control and minimize possible deaths. With the spread of the virus across countries and even in continents, higher education institutions had to suspend face-to-face education, and this caused more than 80% of students not to attend their universities.

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The mental health of university students was significantly affected due to the constant spread of the disease, the sensational news about COVID-19, the distancing of students from the school environment, prolonged isolation at home, lack of personal space at home, uncertainty about returning to university, and financial loss of the family [5,6]. University students have been at high risk for symptoms of depression and anxiety due to their exposure to many stress factors.

Anxiety is a natural state of human life responsible for preparing the individuals against threats and dangers. In triggering situations causing anxiety, individuals develop coping mechanisms creating behavioral changes that help the body cope with anxiety symptoms [7]. Emotional eating behavior is one of these coping mechanisms. Emotional eating is defined as “the tendency of overeating in response to negative emotions such as anxiety or irritability.” This concept is derived from psychosomatic theory, and individuals who have emotional eating behavior cannot distinguish the feeling of hunger from the physiological state accompanying negative emotions [8]. A study investigating the effect of social isolation due to COVID-19 upon general population has reported that one-third of individuals without a history of eating disorder have had increased overeating behaviors when compared to pre-pandemic period, and whereas 17% of adults in the UK have reported eating more than usual, 23% have reported eating less healthy food than normal [9,10]. These changes are possible to reflect emotional eating behaviors caused by social isolation measures that reveal feelings of anxiety [11]. When the studies carried out during the COVID-19 pandemic process have been reviewed, emotional eating, intense energy and excessive intake of high sugar and fatty foods, more increased weight, and eating disorders such as obesity have been associated with stress, anxiety and depression [12,13,14].

It is necessary to understand how people respond to and cope with a global pandemic threat [15]. Since emotional eating is supported with managing emotions incoherently, the behaviors are possible to differ at these times leading to greater feelings of isolation and anxiety in general population [11]. Therefore, this study was planned to analyze the effect of anxiety due to the COVID-19 pandemic upon emotional eating in university students.

## METHODS

### *Type of Research*

The research was conducted in a descriptive, cross-sectional and relationship-seeking nature.

### *Time and Place of the Study*

The research was carried out with university students in Turkey accessed via electronic media in May-June 2020.

### *Sample and Population of the Research*

The universe of this study consisted of university students studying formally in private or state universities in Turkey. The sample consisted of 718 students who continued their university education online at the time of the research. In order to determine whether the sample size is sufficient in the study, Posthoc power analysis was performed using the “G.Power 3.1.9.2” program. In the power analysis, it was determined that the effect size of the study was 0.124 at 0.95 power and 0.05 significance level. Inclusion criteria for the study; They are students who reside in Turkey during the pandemic, continue their university education online, have internet access, and volunteer to participate in the research. Students who did not meet these criteria were excluded from the study.

### *Data Collection Tools*

**Question form.** In this section, questions about some socio-demographic characteristics of the students, COVID-19 outbreak, nutritional behavior (number of meals, food preferences, etc.) and anthropometric measurements (body weight and height) were included.

**Emotional Eating Scale (EES).** Emotional eating scale (EES) Turkish validity and reliability study of which carried out by Kara [16] was on 5-point Likert-type including 25 items and 3 sub-dimensions as anger, anxiety and depression. In the scale, each emotion was asked to be graded between 1 and 5 (1- I do not feel desire to eat and 5- I feel desire to eat too much) and there were no reversely scored items.

**State-trait anxiety inventory (STAI).** It was developed by Spielberger et al. [17] in order to interpret how individuals feel themselves at a certain time

and under certain conditions and their feelings about the current situation; and the Turkish validity reliability was determined by Öner and Le Compte [18]. The State-Trait Anxiety Inventory (STAI) included 20 items. The state-trait anxiety inventory graded the emotions or behaviors experienced by individuals as [1] None, (2) A little, (3) Much, and (4) Totally. There were 10 reverse expressions in the state-trait anxiety inventory. These items were 1st, 2nd, 5th, 8th, 10th, 11th, 15th, 16th, 19th, and 20th. The remaining items of 3, 4, 6, 7, 9, 12, 13, 14, 17, and 18 measured the expressions directly.

#### *Ethical Principles of the Research*

In order to carry out the research, the ethics committee approval dated 30/04/2020 and numbered 04/20 was obtained from the Human Research Ethics Committee and written permission from the Ministry of Health. After the students who participated in the research were informed about the research electronically, it was explained that they were free to participate in the research or not, and they were assured that their personal information would not be disclosed to others, would not be used anywhere else, and that they had the right to withdraw from the study whenever they wanted. Informed voluntary consent was obtained from the participants electronically before starting the survey.

#### *Data Collection*

The study was carried out in May-June 2020 with individuals who met the research criteria within the scope of the research after obtaining written permission of the ethics committee and Ministry of Health. The questionnaire link including open-ended questions, STAI and EES was created through Google forms. The questionnaire link created by the researcher was sent electronically to the WhatsApp groups used by the students; and the students were asked to fill in the questionnaire link completely and share the questionnaire link with other university students using the snowball method. It took approximately 10-15 minutes to complete the questionnaire forms. Declaration of the participant was regarded for bodyweight and height measurement values.

Body Mass Index (BMI) was calculated with the formula of Bodyweight (kg)/height (meter) <sup>2</sup>. According to the BMI classification suggested by WHO, bodyweight less than 18.5 was regarded to be

underweight, bodyweight between 18.5 and 24.9 was regarded to be normal, and bodyweight between 25 and 29.9 was overweight and obese [19].

#### *Analysis and Interpretation of Data*

SPSS 22.0 package software was used for the statistical analysis of the data. The Shapiro-Wilk test was used to assess the normal distribution of the data. For evaluating the data, percentage, average, Independent-sample test, One-way ANOVA test, Pearson correlation and Multiple Regression analysis were used. The Bonferroni test was used for post hoc comparisons. The level of statistical significance was considered to be 0.05 in all tests.

#### *Limitations of the Study*

The study has several strengths. The measurement tools used in the study were previously validated. Another strength is that it focuses on college students who are more likely to experience emotional eating behavior and have a higher risk of mental health disorders. The study has several limitations. First, the study is a cross-sectional design, so causal relationships between the variables cannot be inferred, longitudinal studies are needed. Secondly, since the sample group was reached via social networks, students who were not on social networks or could not use personal computers or smart phones were excluded from the study. Therefore, the sample may have created some bias. Third, an online questionnaire based on self-report questionnaires was used.

## **RESULTS**

The distribution of STAI and EES average scores according to the descriptive properties of the students were presented in Table 1. It was determined that the average of the students included in the study was  $21.51 \pm 7.08$ , 81.1% were female, 57% lived in the city center, 37.6% spent 4-5 hours on the internet or television during the day, and 34.4% spent time on social media as the only activity during the day. 98.9% were not diagnosed with COVID-19, 97.9% did not have a family member diagnosed with COVID-19, and 82.5% adapted into social isolation.

When we look at the distribution of the STAI and EES score averages of the students participating in the research according to their descriptive characteristics, it is seen that the descriptive features such as

gender, type of activity done at home during the day and adaptation to social isolation variables have an effect on the STAI total score; It was determined that the type of activities performed at home during the day had an effect on the EES total score ( $p < 0.05$ ) (Table 1).

Table 1. Mean STAI and EES Scores by Descriptive Characteristics (n = 718)

Characteristics	n	(%)	STAI		EES		
			X±SD	Test p	X±SD	Test p	
<b>Gender</b>							
Male	136	18.9	39.74±5.46	42.37±6.32	<b>t:4.903</b> <b>p:0.000*</b>	48.91±20.54	
Female	582	81.1					46.92±20.66
<b>Living Place</b>							
City Center	409	57.0	40.34±5.73	F:0.307 p:0.736	20.11±0.99	F:0.535 p:0.586	
County Center	218	30.4	39.99±5.65				
Village	91	12.7	40.40±5.90				
<b>Spending time on television or the internet during the day</b>							
0-1 Hour	37	5.2	41.16±6.30	F:0.717 p:0.542	41.56±18.01	F:2.181 p:0.089	
2-3 Hour	163	22.7	39.84±5.34				
4-5 Hour	270	37.6	40.15±5.57				
Over 6 Hour	248	34.5	40.46±6.03				
<b>Activities at home during the day</b>							
Watch TV	40	5.6	40.05±7.70	<b>F:2.779</b> <b>p:0.007*</b>	43.30±15.77	<b>F:3.166</b> <b>p:0.003*</b>	
Read A Book	130	18.1					40.54±5.96
Listen to music	32	4.5					39.90±4.11
Dealing with household chores	142	19.8					39.28±4.90
Sitting without doing anything	47	6.5					42.57±6.56
Spending time on social media	247	34.4					39.99±5.55
Make sport	33	4.6					42.72±6.57
Sleep	47	6.5					40.08±4.83
51.87±22.79							
<b>Diagnosis of COVID-19</b>							
Yes	8	1.1	40.37±7.32	t:0.066	49.62±12.40	t:0.320	
No	710	98.9	40.24±5.70	p:0.947	47.27±20.71	p:0.749	
<b>The diagnosis of COVID-19 in one of the family</b>							
Yes	15	2.1	38.60±5.05	t:1.741	56.46±27.27	t:-1.123	
No	703	97.9	40.27±5.73	p:0.082	47.10±20.45	p:0.262	
<b>Compliance with social isolation</b>							
Yes	592	82.5	40.03±5.76	<b>F:3.050</b> <b>p:0.048*</b>	46.48±19.91	F:2.753 p:0.064	
No	9	1.3	43.44±4.95				
Sometimes	117	16.2	41.06±5.44				
<b>X±SS</b>							
<b>Age (year)</b>	21.51±7.08						

STAI: State Anxiety Inventory EES: Emotional Eating Scale BMI: Body Mass Index \* $p < 0.05$

The distribution of STAI and EES average scores according to BMI and eating behaviors of the students were presented in Table 2. It was determined that 71.6% of the students had normal bodyweight,

50.7% had two meals a day, 26.7% mostly had pastries (cake, cookies, etc.) during the pandemic process, and 63.8% believed fruits and vegetables enhanced their immune system most during the pandemic process. Furthermore, it was revealed that the average BMI of the students was  $22.16 \pm 3.54 \text{ kg/m}^2$ .

When the STAI and EES mean scores of the students participating in the research were compared

according to their BMI and nutritional status; the number of meals per day and the food or supplements consumed during the epidemic, which is believed to strengthen immunity, have an effect on the STAI score averages of the students; It was determined that BMI classification, number of meals per day and number of most frequently consumed foods in the pandemic were effective on the mean EES scores ( $p < 0.05$ ) (Table 2).

Table 2. Distribution of Mean STAI and EES Scores by BMI and Nutritional Behaviours (n= 718)

Characteristics	n	%	STAI		EES	
			X±SD	Test p	X±SD	Test p
<b>BMI Classification (kg/m<sup>2</sup>)</b>						
Underweight (<18.5)	81	11.3	40.12±6.79		40.41±18.93	
Normal (18.5-24.9)	514	71.6	40.35±5.73	F:0.287	47.40±20.08	<b>F:4.788</b>
Overweight (25-29.9)	100	13.9	39.80±4.82	p:0.835	50.93±22.15	<b>p:0.003*</b>
Obesity (≥30)	23	3.2	40.04±5.12		53.43±26.21	
<b>The number of meals</b>						
1	19	2.6	44.47±7.35		44.78±17.57	
2	364	50.7	40.30±5.81	<b>F:4.102</b>	44.92±19.35	<b>F:10.298</b>
3	234	32.6	39.75±5.46	<b>p:0.007*</b>	46.81±18.28	<b>p:0.000*</b>
4 and over	101	14.1	40.35±5.38		57.46±27.07	
<b>The most consumed foods in the pandemic period</b>						
Sweet food	160	22.3				
Ready snacks (biscuits. crackers. chips...)	124	17.3	40.35±5.20		49.39±21.54	
Dried Nuts	24	3.3	40.23±6.24		49.52±21.88	
Tea. Coffea	117	16.3	40.54±3.69		45.54±16.53	
Alcohol	6	0.8	39.68±5.63	F:1.516	43.89±18.83	<b>F:2.297</b>
Water	26	3.6	43.50±11.20	p:0.148	59.50±23.87	<b>p:0.020*</b>
Vegetable. Fruit	50	7.0	42.57±5.95		41.23±14.11	
Pastries (pies. cakes. cookies...)	192	26.7	39.98±5.33		40.52±16.19	
Milk. yoghurt	19	2.7	39.86±5.63		48.99±21.81	
			42.73±7.51		43.52±18.31	
<b>Foods or supplements consumed in the pandemic period believed to strengthen immunity (Supplement)</b>						
Vegetable and Fruit	458	63.8				
Omega 3 (Fish. walnut. purslane...)	25	3.5	39.93±5.57		47.26±20.29	
Probiotics (such as yogurt. kefir)	102	14.2	40.88±6.49		46.12±22.47	
Dry beans	31	4.3	41.29±6.36		50.31±21.29	
Prebiotics	3	0.4	41.22±5.21		49.87±21.19	
Omega 3	2	0.3	51.66±11.59	<b>F:2.443</b>	53.00±28.84	F:0.887
Vitamin D	28	3.9	42.50±2.12	<b>p:0.010*</b>	54.50±23.33	p:0.536
Vitamin C	43	6.0	40.67±5.42		46.85±22.54	
Zinc	4	0.6	38.69±4.84		43.16±20.56	
Vitamin Mineral Complex	4	0.6	39.50±0.57		38.75±17.32	
	22	3.0	40.40±5.36		40.54±19.35	

	<b>X±SS</b>
<b>Body Weight (kg)</b>	61.67±12.14
<b>Height (cm)</b>	166.51±8.28
<b>BMI (BMI) (kg/m<sup>2</sup>)</b>	22.16±3.54

*STAI: State Anxiety Inventory EES: Emotional Eating Scale BMI: Body Mass Index \*p<0.05*

STAI and EES total score averages and levels of the students were presented in Table 3. It was revealed that STAI total score average of the students was 40.24±5.72 and 52% of the students experienced anxiety at moderate level. It was determined that average score of the students' for EES was 47.30±20.63, the average score for sub-dimension of Anger was 19.56±9.23, the average score for the Anxiety sub-dimension was 17.24±7.92, and the average score for Depression sub-dimension was 10.49±5.03.

Table 3. The Average Scores of the Students from the STAI and EES Scales

<b>Scale</b>	<b>n</b>	<b>%</b>	<b>Min-Max</b>	<b>X±SS</b>
<b>STAI</b>	Low Level Of Anxiety (20-39.9 Score)	335	46.7	25-125
	Moderate Anxiety (40-59.9 Score)	378	52.6	25-125
	High Level Of Anxiety (60-80 Score)	5	0.7	25-75
<b>EES</b>	Frustration Subscales			11-55
	Anxiety Subscales			9-45
	Depression Subscales			5-25
	EES Total			25-125
				19.56±9.23
				17.24±7.92
				10.49±5.03
				47.30±20.63

*STAI: State Anxiety Inventory EES: Emotional Eating Scale*

The results of the Pearson Correlation analysis applied for the relationship between the students' BMI, STAI and EES mean scores are given in Table 4.

Table 4. Correlation Assessment of Students' BMI, STAI and EES Scores

<b>Parametreler</b>	<b>BMI</b>	<b>STAI</b>	<b>EES Total</b>	<b>EES Frustration Subscale</b>	<b>EES Anxiety Subscale</b>	<b>EES Depression Subscale</b>
<b>BMI (kg/m<sup>2</sup>)</b>	1					
<b>STAI</b>	0.028	1				
<b>EES Total</b>	0.125**	0.160**	1			
<b>EES Frustration Subscale</b>	0.114**	0.155**	0.948**	1		
<b>EES Anxiety Subscale</b>	0.113**	0.157**	0.947**	0.838**	1	
<b>EES Depression Subscale</b>	0.125**	0.124**	0.868**	0.732**	0.771*	1

*\*\*p<0.01. BMI: Body Mass Index STAI: State Anxiety Inventory EES: Emotional Eating Scale*

Positive and very weak ( $r < 0.20$ ) correlation between BMI and EES total score ( $r=0.125$ ;  $p < 0.05$ ), positive and very weak ( $r < 0.20$ ) relationship between Anger Subscale ( $r=0.114$ ;  $p < 0.05$ ), Positive and very weak ( $r < 0.20$ ) correlation between the Anxiety Sub-dimension ( $r=0.113$ ;  $p < 0.05$ ) and a very weak ( $r=0.125$ ;  $p < 0.05$ ) relationship between the Depression Sub-dimension ( $r = 0.125$ ;  $p < 0.05$ ) was determined. There is a positive and very weak ( $r < 0.20$ ) relationship between STAI and EES total score ( $r = 0.160$ ;  $p < 0.05$ ), a positive and very weak ( $r < 0.20$ ) relationship between anger sub-dimension ( $r = 0.155$ ;  $p < 0.05$ ), a positive and very weak ( $r < 0.20$ ) relationship between the anxiety sub-dimension ( $r = 0.157$ ;  $p < 0.05$ ), and a very weak ( $r = 0.124$ ;  $p < 0.05$ ) relationship between the depression sub-dimension ( $r = 0.124$ ;  $p < 0.05$ ) relationship was found.

In Table 5, the multiple regression model established to predict the effect of gender, body mass index, number of meals, the most consumed food during the quarantine period, time spent on television or internet, home activities for a day, and anxiety level on emotional eating was significant as a whole ( $F(6.692)=105.903$   $p<.05$ ). Gender, body mass index, number of meals, the most consumed food during the quarantine period, time spent on television or internet,

activities performed at home during the day and anxiety level explain 9% of the effect upon emotional eating together ( $R^2=0.094$ ). When the t-test results related to the significance of the regression coefficients were analyzed, it was noticed that body mass index, number of meals, activities performed at home during the day, and anxiety level were each a significant predictor of emotional eating ( $p<0.01$ ).

Table 5. Results of multiple regression analysis regarding the effect of variables on EES

Model	$\beta$	Std. Error	Beta	t	p	Partial	Part	Tolerance	VIF
Constant*	-9.662	10.350		-0.934	<b>0.000*</b>				
Gender	0.628	1.972	0.012	0.318	0.750	0.012	0.011	0.914	1.094
Body mass index	0.769	0.215	0.132	3.583	<b>0.000*</b>	0.134	0.128	0.946	1.057
The number of meals	5.048	0.979	0.186	5.157	<b>0.000*</b>	0.191	0.185	0.986	1.015
The most consumed foods in the quarantine period	-0.236	0.260	-0.033	-0.907	0.365	-0.034	-0.032	0.979	1.021
Spending time on television or the internet during the day	0.629	0.877	0.027	.717	0.473	0.027	0.026	0.911	1.098
Activities at home during the day	0.934	0.395	0.089	2.364	<b>0.018*</b>	0.089	0.085	0.911	1.097
STAI	0.631	0.132	0.175	4.772	<b>0.000*</b>	0.177	0.171	0.955	1.047

\*Dependent variables: EES  $R:0.307$   $R^2:0.094$   $F(6.692)= 105.903$  \* $p:0.000$  Durbin watson:1.992

## DISCUSSION

Due to the COVID-19 pandemic, the anxiety related to the spread of the virus has caused some changes in mood of individuals and accompanying nutritional behavior, and the increase at the time spent at home and the news of the pandemic that is constantly being listened to and watched, increasing anxieties have increased the desire to consume food (especially carbohydrate foods) depending on the mood [20]. Therefore, the effect of anxiety experienced due to COVID-19 pandemic upon emotional eating in university students was discussed in this study, and the data obtained were argued in line with the literature.

In previous studies carried out with university students in Turkey, the anxiety rate experienced due to COVID-19 was found to be higher in females when compared to males [21, 22]. Similarly, in the studies carried out abroad, it was determined that the level of anxiety was higher in females [5, 23]. In this study, it was proved that the state anxiety levels of females

were significantly higher than males. It was reported that females had tendency towards anxiety/depression when compared to males due to both their biological and psychological personality traits and their social and cultural position [24]. The results of the study support the literature information.

Behaviors such as using social media, watching TV series, playing video games or surfing the internet were possible to be displayed in order to reduce the stress and anxiety experienced during the pandemic process [25]. In a study carried out worldwide, it was found that 67% of individuals watched more news broadcasts at home, 45% spent more time on messaging services, 44% spent time on social media, and 36% spend time with computer/video games during the COVID-19 process [26]. In our study, as well, it was found that the anxiety score averages of the students who did sports and did not do any activities at home were significantly higher. Accordingly, it was possible to reveal that students who sat at home without doing any activities had high level of anxiety.

The researchers have stated that social isolation required during infectious disease outbreaks to reduce the spread of infection has exacerbated negative emotions of individuals. Social isolation is possible to lead negative social and psychological consequences such as loneliness, depression, and anxiety [27]. This study and other studies confirmed the results related to the effect of social isolation upon mental health during the pandemic process [28,29].

Unbalanced eating behaviors often appear with emotional disorders such as depression or anxiety [30]. According to the results of this study, it was found that the anxiety scores of the students who had one meal a day during the pandemic process were significantly higher. In a study carried out during the COVID-19 pandemic in Japan, it was found that lack of nutritious meals was associated with anxiety [31]. It was determined that emotional eating scores of the students who had four meals or more a day was higher. In Musharaf's study (2020), it was found that there was a positive relationship between the number of meals and emotional eating.

It was determined that the students who participated in this study consumed the most pastries, sweet foods, snacks (biscuit, cracker, chips, etc.) and tea/coffee, respectively, during the social isolation process. Stress has been known to cause a change in individuals enabling them to prefer extremely tasty foods, namely the foods high in fat and/or sugar, and this trend is stronger in emotional eaters [32]. In a study carried out in Turkey, it was found that individuals consumed the most pastries and sweet foods during the pandemic process [33]. In a study carried out in Norway, it was proved that there was a relationship between psychological distress, emotional eating and sweet foods [32]. In this study, as well, it was found that the emotional eating average score of the students who consumed alcohol, snacks (biscuit, cracker, chips, etc.) and sweet foods during the pandemic process was significantly higher. In this sense, it was possible to reveal that the students who had anxiety disorder and emotional eating behavior due to the reasons such as social isolation, online education, limited living space and insufficient social support during the pandemic process were the ones who consumed pastries, sweet foods and snacks.

It was determined that the foods and supplements consumed by the students in this study believing

them to strengthen the immune system the most during the social isolation process were fruits/vegetables, probiotics (yoghurt, kefir, etc.) and vitamin C. It was found that the anxiety scores of the students who consumed prebiotics during the social isolation process were significantly higher. In a previous study, it was suggested that the foods individuals believed to strengthen the immune system during the pandemic process were probiotics such as fruit/vegetables and yoghurt/kefir [33]. In another study, a significant relationship was specified between yogurt and kefir consumption and anxiety experienced due to COVID-19 [34].

It was determined that 52.6% of the students included in this study experienced moderate level of anxiety, and anxiety score of the students was 40.24 as average. It was found that the state anxiety score of the students determined in the study carried out by Yakar et al. [21] during the COVID-19 pandemic was very close (43.54 as average) to the result of this study. In another study carried out in Turkey, it was revealed that the average state anxiety score of the students was 46.95 [35]. Liu et al. [36] found that 55.6% of university students had mild anxiety, 31.1% had moderate anxiety, and 13.3% had severe anxiety. When considering the results of this study, it was argued that the differences in the anxiety levels of the students differed depending on the region they lived in, the pandemic rates in those regions, the measures taken against the pandemic, and social, family and economic reasons.

In the studies carried out in our country during the COVID-19 process, it was determined that anxiety experienced during the pandemic process was efficient upon emotional eating [37,38]. In their study in Italy, Cecchetto et al. [12] found a positive relationship between anxiety and emotional eating behavior. Similar results were obtained in other studies carried out during the pandemic process [13,14]. In this study, it was found that emotional eating behaviors increased as the anxiety levels of the students increased. Emotional eaters were possible to perceive negative emotions of stress as hunger and had meals as the obvious solution. So that, eating behavior has become a way of avoiding irritating emotional situations or distraction [39]. It was suggested that during the pandemic process, students had more emotional eating depending on their anxiety due to reasons such as social isolation, online education, limited living space, and economic difficulties, and this result was consistent with the results of previous studies.

In other studies in Turkey, it was revealed that there was a positive correlation between emotional eating and BMI [40, 41]. In the study of Musharaf [39] upon the predictors of emotional eating during the COVID-19 pandemic process, it was found that BMI was efficient upon emotional eating. In a study in Italy, it was determined that there was a positive relationship between BMI and emotional eating [12]. The emotional eating behaviors of the students participating in this study was determined to increase as their BMI increased. Since individuals' reactions to each emotion were different from each other, individuals with high BMI were more likely to eat to improve their mood in times of stress. In this sense, the study results supported the information and results in the literature.

## CONCLUSIONS AND RECOMMENDATIONS

It has been determined that university students are anxious at different levels, and that their anxiety affects their emotional nutritional status. University students need attention, help and support from society, families and universities regarding their psychological state. By cooperating with the state and universities to solve the problems; It is recommended to provide crisis-focused psychological services and counseling services to university students in a timely manner. Due to the difficult living conditions, telehealth services and distance education programs need to focus not only on the formal education of students, but also on their physical and psychological health. There is a need for studies with larger samples examining the effects of eating habits on young people. Although the living space is limited to a certain extent, some activities for students to achieve control and enjoyment of life, such as appropriate exercise, housework, reading, music to alleviate emotions, etc. listening is recommended. The important thing in this period is to prevent wrong eating behaviors that may occur due to changing mood, to control body weight and to keep the immune system strong.

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