

The examination of the relationship between nursing students' depression, anxiety and stress levels and restrictive, emotional, and external eating behaviors in COVID-19 social isolation process

Yasemin Kalkan Uğurlu RN, MSN¹  | Duygu Mataracı Değirmenci MSN²  |
Hanife Durgun PhD, RN¹  | Hacer Gök Uğur PhD, RN¹ 

¹Department of Nursing, Faculty of Health Sciences, Ordu University, Ordu, Turkey

²Department of Nutrition and Dietetics, Faculty of Health Sciences, Ordu University, Ordu, Turkey

Correspondence

Yasemin Kalkan Uğurlu, RN, MSN,
Department of Nursing, Faculty of Health Sciences, Ordu University, Cumhuriyet Campus 52200 Ordu, Turkey.
Email: yasemin_kalkan24@hotmail.com

Abstract

Purpose: This study was conducted to examine the relationship between students' anxiety, depression, stress levels, and emotional, external, restrictive eating behaviors in the coronavirus disease 2019 (COVID-19) process.

Design and Methods: This study was conducted in included university involving 411 nursing students who completed the Personal Information Form, Depression, Anxiety, Stress Scale, and the Dutch Eating Behavior Questionnaire. Kruskal–Wallis Test, Mann–Whitney U test, and Spearman's correlation test were used to evaluate the data.

Findings: In the correlation between Depression, Anxiety, Stress Scale subscale scores, and the Dutch Eating Behavior Questionnaire subscale scores, there was no significant relationship between only depression and restrictive eating.

Practice Implications: It was determined that the COVID-19 pandemic process affected the mental health of nursing students and their eating behaviors.

KEYWORDS

eating behaviors, mental health, nursing students, pandemic, SARS coronavirus

1 | INTRODUCTION

The coronavirus disease 2019 (COVID-19) outbreak first started in December 2019 in Wuhan, China, with cases of pneumonia whose etiology could not be determined in a group of people identified as having contact with the seafood market and has become a global health threat.¹ The number of cases continued to increase exponentially inside and outside Wuhan and has become the center of the pneumonia epidemic, which attracts a great deal of attention not only in China but also internationally.² The spread of the outbreak to 34 states of China on January 30, 2020, was announced, and on the same day, the World Health Organization (WHO) declared COVID-19 as an international public health emergency.³

Although It is stated that COVID-19 can be transmitted to people from intermediate hosts, such as bats, the actual transmission path is still controversial. It was understood that the virus was transmitted from person to person through droplets, with the presence of a large number of patients having no contact with the animal market in China and cases occurring in healthcare workers.⁴ In the study on the reproductive rate of COVID-19, it was stated that on average, each COVID-19 case would lead to transmission in four new cases.⁵ Because of the virus transmitting rapidly, the isolation of the cases and the ones contacting the cases have become the most important strategy. Since March 11, 2020, the first case in Turkey, the virus has spread to the whole country within about 3 weeks and to delay the spread of the virus,

all schools (Primary, Secondary Education, and University) have been vacated after the first case and the distance education system has been started. With the circular published on March 21, 2020, people with 65 years of age and older who have a low immune system, chronic lung disease, asthma, chronic obstructive pulmonary disease, cardiovascular disease, kidney, hypertension and liver disease, and those who use drugs that impair the immune system were restricted from going out of their homes, walking in the parks and traveling by public transportation, and are not allowed to go out on the streets and open spaces.⁶ A curfew was also declared for individuals under 20 as of April 4, 2020, and it was stated that the remaining age group (aged 20–65) should isolate themselves in their homes.⁷ Thus, mandatory social isolation affected a total of more than 33 million people, and the vast majority of other individuals out of this scope remained in their homes, isolating themselves socially in order not to become infected.

In social isolation, some rights and freedoms of individuals are temporarily restricted for the benefit of the general public. In such situations where the social distance increases, a wide range of psychological problems such as panic disorders, anxiety, and depression are triggered, especially in young adults who need more socialization.^{8,9} “Did universities' discontinuation of formal education and students' distancing from their social environment increase their anxiety, depression, and stress levels?” brought the question to mind. Especially in nursing students with high awareness of health and disease,^{10,11} it is necessary to evaluate how the severity of the pandemic, the presence of individuals over the age of 65 with chronic disease in the family or the environment and these individuals being a more risky group in terms of COVID-19 and the uncertainty of how long the social isolation period will continue, impact on anxiety, depression, and stress levels.

Many studies in the literature have revealed the mechanisms that support various psychosocial disorders such as anxiety, depression, and stress are associated with eating disorders.^{12–18} There are many studies in the literature showing that emotional eating is associated with anxiety, depression, and stress.^{13,19–21} This study was conducted to examine the relationship between nursing students' anxiety, depression, stress levels, and restrictive, emotional, and external eating behaviors during the COVID-19 social isolation process. The main research questions are as follows:

1. How are nursing students' depression, anxiety, and stress levels during COVID-19 social isolation, and what are the factors that affect them?
2. What are the factors affecting nursing students' restrictive emotional external eating behavior in the COVID-19 social isolation process?
3. How is the relationship between nursing students' depression, anxiety, stress levels, and restrictive, emotional, external eating behaviors during the COVID-19 social isolation process?

2 | DESIGN AND METHODS

2.1 | Setting and participants

The research was conducted on students studying in the nursing department of the Faculty of Health Sciences at a public university in Turkey between May 11 and 17, 2020. The universe of the study consisted of 438 students studying in the nursing department and 411 (93.83%) students who agreed to participate in the study and answered all of the survey questions. In the research, no sample was taken and the entire universe was taken as a sample.

2.2 | Measures

The data were collected using the Personal Information Form, the Depression, Anxiety and Stress Scale (DASS-42), and the Dutch Eating Behavior Survey (DEBQ).

2.2.1 | Personal information form

The personal information form was prepared^{2,22,23} by the researchers in line with the literature. In the form, seven questions including the socio-demographic characteristics of the participants (age, gender, class, family type, place of stay in the last 15 days, number of people in the household, and body mass index [BMI]) were asked.

2.2.2 | Depression, Anxiety and Stress Scale

The DASS-42 used to determine the participants' psychological responses was developed by Lovibond and Lovibond²⁴ and adapted to Turkish by Bilgel and Bayram.²⁵ The scale, which was designed as a 4-digit Likert type, consisted of 42 items in total, 14 items in depression, 14 items in anxiety, and 14 items in stress subdimensions. The total subscale score for depression was evaluated as normal (0–9), mild depression (10–12), moderate depression (13–20), severe depression (21–27), and very severe depression (28+). The total subscale score for anxiety was evaluated as normal (0–6), mild anxiety (7–9), moderate anxiety (10–14), severe anxiety (15–19), and very severe anxiety (20+). The total subscale score for stress was evaluated as normal (0–10), mild stress (11–18), moderate stress (19–26), severe stress (27–34), and very severe stress (35+). The structure validity for the Turkish form was analyzed with exploratory and confirmatory factor analyses. In exploratory factor analysis, a 3-factor measurement tool, which explained 44% of the total variance, was obtained. In confirmatory factor analysis showed that root mean square error of approximation = 0.08, goodness-of-fit index = 0.79, and comparative fit index = 0.75. Cronbach alpha's internal consistency reliability coefficients were 0.92 for depression, 0.86 for anxiety, and 0.88 for stress. The item-total score

correlations of the scale were calculated as 0.48–0.70 for depression, 0.33–0.59 for anxiety, and 0.43–0.70 for stress.²⁵

2.2.3 | Dutch Eating Behavior Questionnaire

The DEBQ was used to determine the eating behavior of the participants. The questionnaire developed by Van Strien et al.,²⁶ was adapted to Turkish by Bozan et al.²⁷ The items in the questionnaire are evaluated with a 5-point Likert scale (1: never, 2: rarely, 3: sometimes, 4: frequent, and 5: very often). The total score of the test is not evaluated. Three subscales (emotional eating behaviors, external eating behaviors, and restricted eating behaviors) are evaluated within itself. There is no breakpoint in the scoring of the test, being high of the total score of the subscales assessed in itself indicates the negativity related to eating behavior. In the Turkish version of the questionnaire, the first 10 questions are the questions that evaluate restricted eating, emotional eating between 11 and 23, and external eating attitudes between 24 and 33. Cronbach's alpha values of subscales with factor loads ranging from 0.52 to 0.90 are between 0.90 (external eating) and 0.97 (emotional eating). The internal consistency coefficient of the entire scale was found to be 0.94. It was stated that the item-total and item-general total correlation values of the subscales were high.²⁷

2.3 | Data collection procedure

Since the government of the Republic of Turkey advised the public to minimize face-to-face interaction and isolate themselves at home, the participants were invited to the study electronically. Participants filled out the questionnaires through the online survey platform.

2.4 | Ethical considerations

This study was conducted in compliance with the principles of the Helsinki Declaration. Before the start of the study, written permission from the COVID-19 Scientific Research Studies Commission of the Ministry of Health of the Republic of Turkey and approval of the Ethics Committee (Dated April 30, 2020, Numbered 2020/74) was obtained from the Clinical Research Ethics Committee of a university. Besides, an informed consent form was added to the first page of the online data collection form, and after the approval of the

student who wanted to participate in the study was provided, it was enabled to continue the data collection form.

2.5 | Data analysis

The analysis of the data was done in the SPSS 20.0 package program. First, the suitability of the data for normal distribution was evaluated by the Kolmogorov–Smirnov test. Since the data did not show normal distribution, nonparametric tests were used in the analyses. Kruskal–Wallis test, Mann–Whitney U test, and Spearman's correlation test were used to evaluate the data. The significance level was taken as 0.05 in the study.

3 | FINDINGS

It was determined that the average age of nursing students in the study was 20.60 ± 1.72 (min: 18; max: 33), 79.3% were girls, 27.0% were third grade, 80.0% were nuclear family, 92.2% lived with his family during the social isolation process, and the average number of people in the household was 4.52 ± 1.48 (min: 1; max: 11). The BMI of 65.7% of students was found to be within the normal (18.5–24.9) range.

In the study, 21.7% of the participants reported moderate depressive symptoms, 17.8% reported mild anxiety symptoms and 29.7% reported mild stress symptoms (Table 1). A statistically significant relationship was found between the age of the students and the mean scores of the DASS-42 depression scale ($p < 0.05$). As the age of students increases, depression levels increase. A statistically significant difference was found between students' gender and DASS-42 stress scale mean scores ($p < 0.05$). The female students had higher stress levels. It was determined that there was a statistically significant relationship between the students' accommodation and the DASS-42 stress scale mean scores ($p < 0.05$). The students who stayed with their family during the social isolation process had higher stress levels. It was determined that there was a statistically significant relationship between the number of people in the household where the students live and the mean scores of the DASS-42 depression scale ($p < 0.05$). As the number of people in the household increases, the level of depression decreases. It was found that there was a statistically significant difference between the BMI of the students and the DASS-42 depression scale mean scores ($p < 0.05$). The students who are slightly overweight have a higher level of depression (Table 2).

Sub-Dimensions	Normal <i>n</i> (%)	Mild <i>n</i> (%)	Moderate <i>n</i> (%)	Severe <i>n</i> (%)	Very severe <i>n</i> (%)
Depression	183 (44.5)	40 (9.7)	89 (21.7)	54 (13.1)	45 (10.9)
Anxiety	202 (49.1)	73 (17.8)	68 (16.5)	29 (7.1)	39 (9.5)
Stress	149 (36.3)	122 (29.7)	91 (22.1)	41 (10.0)	8 (1.9)

TABLE 1 DASS-42 scale score distribution of the nursing students

Abbreviation: DASS-42, Depression, Anxiety and Stress Scale.

TABLE 2 The comparison of the students' socio-demographic features with DASS-42 and DEBQ

Descriptive characteristics	N	%	Depression Median (min-max)	Anxiety Median (min-max)	Stress Median (min-max)	Restrictive eating Median (min-max)	Emotional eating Median (min-max)	External eating Median (min-max)
Age	21.00 (18-33)		21.00 (18-33)	21.00 (18-33)	21.00 (18-33)	21.00 (18-33)	21.00 (18-33)	21.00 (18-33)
	<i>r</i>		0.106*	0.051	0.084	0.028	-0.009	0.067
	<i>p</i>		0.032	0.303	0.089	0.569	0.853	0.175
Gender	326	79.3	12.00 (0-45)	6.88 (0-42)	14.58 (0-36)	24.62 (10-48)	30.21 (13-65)	31.00 (15-50)
	Female							
	85	20.7	8.73 (0-37)	5.14 (0-37)	10.60 (0-34)	21.25 (10-40)	26.57 (13-63)	30.00 (10-46)
	MWU		12,391.500	12,284.500	10,551.500	11,619.500	11,137.000	10,488.000
	<i>p</i>		0.133	0.107	0.001	0.022	0.005	0.001
Grade	108	26.3	8.88 (0.00-45.00)	5.42 (0.00-42.00)	13.33 (0.00-36.00)	22.00 (10.00-48.00)	30.00 (13.00-65.00)	84.18 (33.00-135.00)
	1st Grade							
	95	23.1	9.71 (0.00-45.00)	6.08 (0.00-28.00)	12.20 (0.00-36.00)	24.46 (10.00-47.00)	29.86 (13.00-63.00)	85.00 (54.00-131.00)
	2nd Grade							
	111	27.0	12.00 (0.00-44.00)	6.64 (0.00-36.00)	14.14 (0.00-36.00)	23.57 (10.00-45.00)	27.44 (13.00-65.00)	82.20 (46.00-143.00)
	3rd Grade							
	97	23.6	13.50 (0.00-39.00)	7.71 (0.00-37.00)	15.50 (0.00-34.00)	25.25 (10.00-47.00)	30.90 (14.00-65.00)	91.00 (41.00-143.00)
	4th Grade							
	KW		6.505	1.636	5.250	2.924	3.809	9.568
	<i>p</i>		0.089	0.651	0.154	0.403	0.283	0.023
Family type	329	80.0	11.58 (0.00-45.00)	6.68 (0.00-42.00)	14.04 (0.00-36.00)	24.52 (10.00-47.00)	29.94 (13.00-65.00)	38.83 (310.00-49.00)
	Nuclear family							
	69	16.8	10.50 (0.00-43.00)	7.00 (0.00-33.00)	13.00 (0.00-36.00)	21.20 (10.00-48.00)	27.00 (13.00-64.00)	29.82 (13.00-50.00)
	Extended family							
	13	3.2	9.00 (0.00-37.00)	4.75 (1.00-37.00)	12.00 (3.00-34.00)	18.00 (11.00-34.00)	27.67 (13.00-65.00)	29.00 (23.00-41.00)
	Broken family							
	KW		0.986	1.594	1.170	3.891	1.744	1.684
	<i>p</i>		0.611	0.451	0.557	0.143	0.418	0.431
Residence	379	92.2	12.00 (0.00-45.00)	7.00 (0.00-42.00)	14.00 (0.00-36.00)	24.00 (10.00-47.00)	30.00 (13.00-65.00)	86.00 (33.00-143.00)
	With Family							
	6	1.5	7.00 (1.00-21.00)	5.50 (1.00-10.00)	7.00 (3.00-15.00)	19.00 (12.00-28.00)	25.00 (19.00-64.00)	79.50 (54.00-112.00)
	In a dormitory							
	16	3.9	7.00 (1.00-39.00)	4.50 (0.00-28.00)	6.00 (2.00-36.00)	20.50 (10.00-34.00)	24.50 (13.00-65.00)	69.00 (59.00-122.00)
	Alone at home							

TABLE 2 (Continued)

Descriptive characteristics	N	%	Depression		Anxiety		Stress		Restrictive eating		Emotional eating		External eating	
			Median (min-max)											
With his/her friends at home	10	2.4	7.50 (0.00–28.00)	2.50 (1.00–18.00)	10.50 (1.00–29.00)	22.50 (12.00–48.00)	18.50 (14.00–44.00)	66.50 (51.00–101.00)						
KW			2.931	3.224	7.935	2.314	8.508	7.118						
<i>p</i>			0.402	0.358	0.047	0.510	0.037	0.068						
Number of people in household	4.52 ± 1.48 (Min:1; Max:11)		4.52 ± 1.48 (Min:1; Max:11)											
<i>r</i>			-0.105*	-0.008	-0.032	0.016	0.021	0.034						
<i>p</i>		0.033	0.878	0.515	0.745	0.670	0.487	0.034						
Body mass index	52	12.7	12.00 (0.00–36.00)	6.50 (0.00–27.00)	13.00 (1.00–33.00)	15.00 (10.00–48.00)	27.00 (14.00–47.00)	31.00 (19.00–50.00)						
Underweight (< 18.5)														
Normal (18.5–24.9)	270	65.7	10.00 (0.00–45.00)	6.00 (0.00–42.00)	13.00 (0.00–36.00)	25.00 (10.00–47.00)	29.00 (13.00–65.00)	31.00 (10.00–47.00)						
Slightly fat (25–29.9)	77	18.7	17.00 (0.00–39.00)	7.00 (0.00–37.00)	18.00 (0.00–36.00)	26.00 (10.00–43.00)	33.00 (13.00–65.00)	29.00 (23.00–45.00)						
First degree obese (30–34.9)	12	2.9	13.50 (0.00–34.00)	9.00 (0.00–18.00)	17.50 (7.00–28.00)	29.00 (13.00–33.00)	39.00 (25.00–62.00)	32.00 (23.00–45.00)						
KW			9.775	4.14	7.274	26.101	11.358	23.301						
<i>p</i>			0.021	0.247	0.064	0.000	0.010	0.000						

Abbreviations: DASS-42, Depression, Anxiety and Stress Scale; DEBQ, Dutch Eating Behavior Questionnaire; KW, Kruskal-Wallis test; MWU, Mann-Whitney U test; *r*, Pearson's correlation analysis. **p* < 0.05.

In the study, it was found that there was a statistically significant difference between students' gender and the mean scores of DEBQ restrictive, DEBQ emotional, and DEBQ external eating scale ($p < 0.05$). The female students' restrictive, emotional, and external eating behaviors are higher. It was determined that there was a statistically significant difference between the students' class and the mean scores of DEBQ external eating scale ($p < 0.05$). The external eating behavior is higher in the senior students. It was determined that there was a statistically significant difference between the students' accommodation and the mean scores of the DEBQ emotional eating scale ($p < 0.05$). The emotional eating behavior is high in the students who stayed with their family. A statistically significant difference was found between students' BMI and the mean scores of DEBQ restrictive, DEBQ emotional, and DEBQ external eating scale ($p < 0.05$). The restrictive, emotional, and external eating behaviors of first-degree obese students are higher (Table 2).

There was no statistically significant relationship between the mean scores of the DASS depression scale and the DEBQ restrictive scale of nursing students ($p > 0.05$). A statistically significant relationship was found between the mean scores of the students' DASS depression scale and the DEBQ Emotional Eating and the DEBQ External Eating Scale ($p < 0.05$). The emotional and external eating behaviors increase as the students' depression increases. It was determined that there was a statistically significant relationship between the students' DASS Anxiety Scale and the mean scores of DEBQ Restrictive Eating, DEBQ Emotional Eating, and DEBQ External Eating Scale ($p < 0.05$). As the students' anxiety increases, restrictive eating, emotional eating, and external eating behavior increase. A statistically significant relationship was found between the students' DASS Stress Scale and the mean scores of DEBQ Restrictive Eating, DEBQ Emotional Eating, and DEBQ External Eating Scale ($p < 0.05$). As the students' stress increases, restrictive eating, emotional eating, and external eating behaviors increase (Table 3).

TABLE 3 The relationship between the students' DASS-42 and DEBQ scores

		DEBQ restrictive	DEBQ emotional eating	DEBQ external eating
DASS depression	<i>r</i>	0.064	0.220**	0.194**
	<i>p</i>	0.193	0.000	0.000
DASS anxiety	<i>r</i>	0.097*	0.275**	0.226**
	<i>p</i>	0.049	0.000	0.000
DASS stress	<i>r</i>	0.119*	0.282**	0.303**
	<i>p</i>	0.016	0.000	0.000

Abbreviations: DASS-42, Depression, Anxiety and Stress Scale; DEBQ, Dutch Eating Behavior Questionnaire; *r*, Pearson's correlation analysis.

* $p < 0.05$.

** $p < 0.001$.

4 | DISCUSSION

This study was carried out to examine the relationship between anxiety, depression, stress levels, and restrictive, emotional, and external eating behaviors of the nursing students who stayed at home during the COVID-19 social isolation process that affected all humanity.

In the study, It was found that 143 (34.8%) of the nursing students had moderate to severe depression, 97 (23.9%) had moderate to severe anxiety and 132 (32.1%) had moderate to severe stress symptoms. In the study conducted to examine the rapid psychological effects of the pandemic 14 days after the first case of COVID-19 in China, it was stated that 16.5% of the participants had symptoms of moderate to severe depression, 28.8% had symptoms of moderate to severe anxiety, and 8.1% had symptoms of moderate and severe stress.² In our study, the participants' depression and stress levels were higher and their anxiety levels were lower, It made us think that it may have been caused by the pandemic's late psychological responses because we collected data about 5 months after the first case of COVID-19 occurred.

In the study, when the sociodemographic characteristics of the students and the depression anxiety and stress scale were compared; It was determined that as the age of the students increased, their depression levels increased. In contrast to our study, in the study conducted with a similar age group sample, it showed that the mean depression score of students in the COVID-19 pandemic was higher than the others in the youngest age group (18–20 years).²⁸ In a study conducted with the 18–30 age group in the United States, it was concluded that there was no relationship between age and depression.²⁹ In a study conducted with the general population in our country, it was found that young participants between the ages of 18 and 29 had higher depression scores than others.³⁰ Similarly, in a study conducted in Spain with a wide age range, it was stated that the average stress, anxiety, and depression level was the highest in the 18–25 age group, then in the 26–60 age group and at least 61 age group and above.³¹ Given the relationship between age and depression, studies report that the prevalence of depression decreases with increasing age.^{32,33} It is thought that these findings in the studies are due to the efforts of university students' adapting to the practices of distance education, who make up the majority of the young age group and are not accustomed to it. In our study, it can be said that individuals in the lower age group spend a longer time on social media and that it is easier to access information pollution on social media that causes them not to experience depression. In the study, it was determined that the stress level of the female students was higher than that of the male students. Similarly, studies indicated that women had higher levels of stress, anxiety, and depression during the COVID-19 pandemic process.^{2,34,35} It was stated that women were better informed about the disease during the COVID-19 outbreak than men and paid more attention to recommendations such as avoiding public spaces and wearing masks.³⁶ Women's anxiety about the disease in this process can cause negative emotions such as stress to be seen more frequently in the individual. In the

study, it was found that as the number of people in the household increased, the level of depression decreased. In the study conducted by Wang et al.,² while the household size and DASS subscale scores were not related, Üstün³⁰ stated that the depression scores of the participants who were away from their families and social life and who felt lonely in this process were significantly higher than the other participants.^{2,30} Similarly, the study investigating the negative psychological effects of the COVID-19 pandemic process on individuals concluded that living with the family protected them from negative psychological effects.³⁷ However, in our study, it was found that the students who stayed with their family during the quarantine process had higher stress levels. Contrary to this finding, it was stated in the studies with young adults that the participants who received emotional support from their family, not from their friends or other individuals, had lower levels of depression and stress.^{29,38} Considering the possible tangible needs in the period of the pandemic in young adults, family support may be more meaningful, but it is thought that students have increased stress levels due to their additional responsibilities in the family during this period. It was found that family type and a class of students did not affect depression anxiety and stress level. Similarly, in a study with the general population in Turkey, while it was stated that there was no significant difference between the average depression scores according to the family type, on the other hand, it was stated that in a study with university students in Spain, fourth-year students had significantly lower depression scores compared with first-year students.^{30,39} In the study, it was found that students with mild obesity had higher levels of depression. Khan et al.⁴⁰ stated that there was a positive and statistically significant relationship between BMI and major depression in the study in which they examined the relationship between major depression and BMI. Pahali et al.,⁴¹ in their study where they examined the relationship between psychiatric diseases and BMI, stated that the mean score of depression scale was higher than other individuals and that there was a statistically significant relationship between BMI and depression score. Dolatian et al.,⁴² in their study where they examined the relationship between BMI and depression, stated that individuals with BMI 25 and above had a higher mean depression score than those with BMI below 25. Tashakori et al.,⁴³ in their study where they examined the relationship between BMI and depression, stated that individuals who were slightly obese ($25 \text{ BMI} < 30$) experienced moderate depression and individuals who were obese ($\text{BMI} > 30$) experienced major depression.^{40–43} This finding obtained in the study is similar to the findings made before the pandemic.

In the study, it was found that the female students had higher restrictive, emotional, and external eating behaviors. Emotional eating is overeating behavior that occurs mostly after negative emotions.⁴⁴ Emotional eating behavior occurs in response to negative emotions.⁴⁵ In many studies, it is reported that women have more restrictive, emotional, and external eating behaviors than men.^{46–50} In a study done by McCrone et al.,⁴⁸ it was reported that women's eating behaviors were associated with changing moods rather than starvation. In a study by Nagl et al.,⁴⁹ it was found that restrictive and emotional

eating scores of women were significantly higher than men. In a study conducted by Nolan et al.,⁵⁰ it was observed that women with higher sensitivity to body dissatisfaction and weakness had more restrictive, emotional, and external eating behaviors. In a study conducted by Konttinen et al.⁴⁷ with 2312 male and 2674 female individuals, it was found that depressive emotions and emotional eating scores were higher in women than men. In a study by Keskitalo et al.,⁴⁶ it was found that emotional eating scores were higher than men. In a study conducted by Serin and Koç²⁸ with university students during the COVID-19 pandemic period, it was reported that the emotional and external eating behaviors of the female students were significantly higher than the male students. In the same study, it was stated that the restrictive eating behavior of the female students was higher than the male students, but this difference was not statistically significant.²⁸ In our study, the reason for the restrictive, emotional, and external eating behavior of the female students is higher than the male students, can be explained by the fact that women had higher anxiety and stress levels in the quarantine process and pandemic affected women's emotional state more negatively. External eating behavior is higher in senior students in the study. External eating behavior is a form of uncontrolled food intake and features such as the presence, appearance, and smell of food increase the desire to eat.^{51,52} In external eating behavior, individuals do not experience a real hunger physiologically, they are affected by an external factor such as tissue or smell and they perform eating behavior. External eating behavior occurs especially in cases of stress.^{51,53} It is thought that external eating behavior is seen more in senior students because of the higher awareness of them about the disease and accordingly their more stressful experience. In the study, emotional eating behavior was higher in the students who stayed with their parents. As we have already mentioned, emotional eating is the behavior of overeating caused by negative emotions and which occurs in response to these emotions.^{44,45} The students who lived with their parents are likely to live with their family elders (grandparents, grandparents, etc.) or their family elders may be in the immediate vicinity. The fact that older individuals are a high-risk group in terms of COVID-19 and students' high awareness about this issue may trigger the fear and anxiety of COVID-19 in these students. It is thought that this fear and stress may trigger more emotional eating behavior. In the study, it was determined that the first-degree obese students had higher restrictive, emotional, and external eating behavior. In a study evaluating the relationship between depression and BMI, it was found that the relationship between depression degree and the DEBQ score and BMI was directly proportional.⁵⁴ In another study evaluating the relationship between depression and emotional eating behaviors and BMI, it was found that depression and emotional eating behaviors were related to BMI value.⁵⁵ In a study where Strien et al.⁵⁶ examined the relationship between emotional eating behavior and depression and obesity status, it was found that depressive mood in women was associated with DEBQ and BMI. In a study conducted with 3735 people in Finland, the relationship between depression, emotional eating, and weight gain was evaluated, and it was concluded that depression and emotional eating behavior were positively associated

with BMI and waist circumference measurements.⁵⁷ In another study, it was reported that restrictive eating behavior caused obesity in the future.⁵⁸ Our research finding is similar to the literature. In light of all this information, we can conclude that emotional, restrictive, and external eating behaviors caused by especially negative emotions such as anxiety, stress, anger, sadness, depressed feelings cause an increase in BMI in the long term and hence obesity. In our study, it was an expected result that the first-degree obese individuals with the highest BMI had emotional, restrictive, and external eating behaviors. Since the COVID-19 pandemic process increases stress levels in individuals, the risk of first-degree obese individuals turning to emotional, restrictive, and external eating behavior during this period is quite high. In this process, especially the control of individuals in this group and the regulation of their nutrition can be very important in terms of stopping the progress of obesity.

In the study, it was found that there was no statistically significant relationship between the students' depression level and restrictive eating behavior. In a study by Löffler et al.,⁵⁹ it was reported that restrictive eating behavior increased as the BMI increased. The vast majority of the participants in our study had an ideal BMI. Considering that restrictive eating behavior is generally observed in individuals with high BMI, this result is an expected situation in our study. Also, it was found that emotional eating and external eating behaviors increased as students' depression increased and restrictive eating, emotional eating, and external eating behaviors increased as students' anxiety and stress increased. In a study conducted during the pandemic process, where the eating behaviors and depression situations of university students were examined, a positive and significant correlation was found between the mean scores of depression and restrictive eating behaviors of students.²⁸ There was a statistically significant positive relationship between depression levels and eating behaviors in studies that were examined the relationship between eating behaviors and depression states of individuals before the pandemic.^{26,55,60} Similarly, in the study where the eating behaviors and depression states of university students were examined during the COVID-19 pandemic process, it was determined that there was a significant relationship between depression level and emotional eating behavior, and there was no statistically significant relationship between depression level and external eating behavior.²⁸ Our research finding suggested that students tended to eat to suppress negative feelings they had felt due to social isolation during the COVID-19 pandemic. However, the fact that the study was conducted on nursing students studying in only one faculty in Turkey has limitations in terms of the generalizability of the results.

5 | CONCLUSIONS AND RECOMMENDATIONS

In the study, it was found that emotional eating and external eating behaviors increased as nursing students' depression increased, and restrictive eating, emotional eating, and external eating behaviors

increased as students' anxiety and stress increased. In line with these results; It may be beneficial to develop online psychoeducation and psychotherapy programs and direct young people to these platforms in the process of COVID-19 social isolation.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

ORCID

Yasemin Kalkan Uğurlu  <http://orcid.org/0000-0003-0096-5593>

Duygu Mataracı Değirmenci  <http://orcid.org/0000-0003-2136-1545>

Hanife Durgun  <https://orcid.org/0000-0003-1622-8184>

Hacer Gök Uğur  <http://orcid.org/0000-0002-0371-0556>

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