

## Examining the Relationship Between COVID-19 Fear and Distress and Emotional Eating Behaviour Among University Students: A Post-Pandemic Cross-Sectional Study

### Üniversite Öğrencilerinde COVID-19 Korku ve Sıkıntısı ile Duygusal Yeme Davranışı Arasındaki İlişkinin İncelenmesi: Pandemi Sonrası Kesitsel Bir Çalışma

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#### Abstract

The COVID-19 pandemic and the measures taken during this period have emerged as significant events inducing notable psychological effects on individuals, with emotional eating behaviour being one of the consequential outcomes. The main purpose of this study is to examine the relationship between COVID-19 fear and distress and eating behaviour. The COVID-19 Related Psychological Distress Scale was utilized to assess the psychological effects of COVID-19, while the Emotional Eating Behaviour Scale was employed to measure emotional eating behaviour. This study was conducted among 460 university students with mean age of 20.6 years, 73.9% were female. The mean score for the COVID-19 Related Psychological Distress Scale among participants was found to be 36.2±7.2, whereas the Emotional Eating Behaviour Scale score was determined as 71.1±19.1. Females had a significantly higher CORPD fear anxiety score than males ( $p<0.001$ ). Compared to non-vaccinated study participants, the CORPD fear anxiety score was significantly higher in vaccinated participants ( $p=0.042$ ). The CORPD suspicion score was significantly correlated with the Emotional Eating Behaviour Scale ( $r: 0.250$ ,  $p<0.001$ ). Total score of Emotional Eating Behaviour, indicating that the adverse psychological effects induced by COVID-19 also negatively affect individuals' eating behaviour. In conclusion, our data demonstrated that COVID-19 fear, and distress were associated with eating behaviour in university students. For this reason, especially during pandemic periods, dietitians should be actively involved in the treatment process and stay in touch with individuals.

**Key Words:** COVID-19, emotional eating, fear, pandemic, eating disorders

#### Özet

COVID-19 salgını ve bu dönemde alınan tedbirler, bireylerde psikolojik etkiler oluşturan önemli olaylar olarak ortaya çıkmış ve bunun sonuçlarından biri de duygusal yeme davranışı olmuştur. Bu çalışmanın temel amacı COVID-19 korku ve sıkıntısı ile yeme davranışı arasındaki ilişkiyi incelemektir. COVID-19'un psikolojik etkilerini değerlendirmek amacıyla COVID-19 İlişkili Psikolojik Sıkıntı Ölçeği, duygusal yeme davranışını ölçmek için ise Duygusal Yeme Davranışı Ölçeği kullanılmıştır. Bu çalışma; yaş ortalaması 20,6 olan 460 üniversite öğrencisi ile yürütülmüştür ve katılımcıların %73,9'u kadındır. Katılımcıların COVID-19 İlişkili Psikolojik Sıkıntı Ölçeği puan ortalaması 36,2±7,2, Duygusal Yeme Davranışı Ölçeği puanı ise 71,1±19,1 olarak belirlenmiştir. Kadınların CORPD korku kaygı puanı erkeklerden anlamlı derecede daha yüksektir ( $p<0,001$ ). Aşı olmamış katılımcılarla karşılaştırıldığında, CORPD korku kaygısı puanı aşı olmuş katılımcılarda önemli ölçüde daha yüksektir ( $p=0,042$ ). CORPD şüphe puanı Duygusal Yeme Davranışı Ölçeği ile önemli ölçüde ilişkiliydi ( $r: 0,250$ ,  $p<0,001$ ). Duygusal Yeme Davranışı toplam puanı, COVID-19'un neden olduğu olumsuz psikolojik etkilerin bireylerin yeme davranışlarını da olumsuz etkilediğini göstermektedir. Sonuç olarak, verilerimiz COVID-19 korku ve sıkıntısının üniversite öğrencilerinde yeme davranışıyla ilişkili olduğunu göstermiştir. Bu nedenle özellikle pandemi dönemlerinde diyetisyenlerin de tedavi sürecinde sahada aktif rol alarak bireyler ile iletişim halinde kalması sağlanmalıdır.

**Anahtar kelimeler:** COVID-19, duygusal yeme, korku, pandemi, yeme bozuklukları

**Atif için (how to cite):** Kemaloğlu, E. (2024). Examining the relationship between COVID-19 fear and distress and emotional eating behaviour among university students: A post-pandemic cross-sectional study. *Nuh'un Gemisi Sağlık Bilimleri Dergisi*, 1(2), 11-19.

Gönderi Tarihi: 11.06.2024, Kabul Tarihi: 23.09.2024, Yayın Tarihi: 31.12.2024

## 1. Introduction

The transition from hunter-gatherer lifestyles to agrarian societies and the commencement of communal living marked the onset of the earliest recorded pandemics in history, with numerous pandemics occurring since then (Piret & Boivin, 2021). The Athenian Plague of 430 B.C. was the earliest known pandemic documented in written sources (Huremović, 2019), while the most recent pandemic event is the Coronavirus disease pandemic (COVID-19) (Ciotti et al., 2020). Predicting the frequency and severity of pandemics thereafter is exceedingly challenging. Pandemics, particularly the COVID-19 pandemic, have not only had significant global impacts on healthcare systems, trade, and the economy but have also affected social life by generating paranoid fears and fostering isolation, leading to notable individual repercussions (Mishra et al., 2020). As of February 2024, with cases continuing to be reported and occasional fluctuations in case numbers occurring, the COVID-19 pandemic (WHO, 2024) has resulted in physical and mental health problems across all segments of society, with these sources of stress also giving rise to negative eating behaviours (Al-Musharaf, 2020). Meeting nutritional needs is not only a biological necessity but also crucial from a psychological standpoint, as one's mental state can influence eating behaviours, and conversely, eating behaviours can affect mental well-being (İnalkaç & Arslantaş, 2018; Demir Gökmen & Yılmaz 2021).

Emotional eating behaviour is defined as a type of eating disorder characterized by excessive eating tendencies in response to negative emotions or stress (Strien, 2018). The COVID-19 pandemic period is also a situation that can induce negative emotions in individuals and trigger emotional eating behaviour. Therefore, the main purpose of this study is to examine the effects of COVID-19 fear and distress on eating behaviour after the active pandemic period and to provide researchers with insight into potential new epidemics.

## 2. Method

### 2.1. Study Design and Participants

The data of this observational and cross-sectional study were collected between April and July 2023. The population of the research consisted of 12,193 students studying at the university where the study was conducted. According to the data of a study conducted with university students on the subject, the COVID-19 fear rate among students was found to be 44% (Akdeniz et al., 2020). In line with these data, sample calculations were made using the OpenEpi analysis program. The sample size was calculated as 368 people with a 95% confidence level ( $\alpha=0.05$ ) and 99% power ( $\beta=0.01$ ). Taking into account a 10% margin of error, the sample size was determined as 405 people. In accordance with the CORPD scale, the study participants should be non-infected with COVID-19. Therefore, the study sample was selected from individuals who could represent this population. Volunteers who were not infected with COVID-19, did not have any chronic or psychological illnesses, had not been diagnosed with an eating disorder, were not using medication/nutritional supplements, and were not on a diet were included in the study. Research data were collected using a virtual snowball sampling method via an online form.

### 2.2. General and Sociodemographic Information

The first section included questions about age, gender, smoking and alcohol use, and vaccination status. Additionally, an item questioning the status of having COVID-19 was added to exclude individuals who had COVID-19 from participating in the study.

### 2.3. COVID-19 Related Psychological Distress Scale (CORPD)

CORPD, developed by Feng et al. (2020), was adapted to Turkish by Ay et al (2022). The scale, which aims to determine the fear and anxiety about COVID-19 of individuals who have not had COVID-19, consists of 12 questions with a 5-point Likert structure. The score that can be obtained from the scale varies between 12-60, and the increase in the total score is associated with COVID-19 fear and anxiety. The scale consists of two subscales: fear-anxiety and suspicion. The Cronbach  $\alpha$  coefficient of the scale is 0,88.

### 2.4. Emotional Eating Scale

The Emotional Eating Behaviour Scale was used to measure emotional eating behaviour (Bilgen and Dönmez, 2018). The scale, which consists of 30 questions with a 5-point Likert structure, has four subscales (eating in response to tension, eating to cope with negative emotions, self-control, and controlling eating in the face of stimuli). The scale gives scores ranging from 30 to 150, with higher scores indicating a high level of emotional eating behaviour. The Cronbach's  $\alpha$  coefficient of the scale is 0,941.

### 2.5. Statistical Analysis

Data analysis was conducted using the SPSS 25.0 software package. The normality assumption of quantitative variables was checked using the Kolmogorov-Smirnov test, and data within the range of -1.5 to +1.5 were assumed

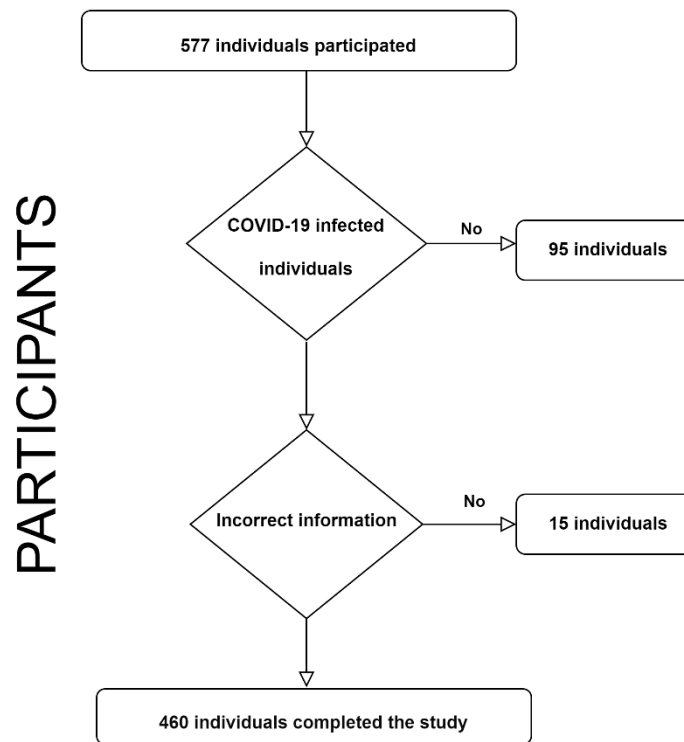
to be normally distributed (Tabachnick, 2013). It was seen that all datasets follow a normal distribution. Descriptive statistics for quantitative variables included mean  $\pm$  standard deviation for normally distributed variables. Descriptive statistics for categorical variables were presented as frequency and percentage. Independent two-sample t-tests were used for comparing normally distributed variables between independent groups. Pearson Correlation Analysis was employed to test the correlation between independent groups. In Pearson Correlation Analysis, the strength of the correlation was interpreted as follows:  $r < 0.2$  very weak or no correlation,  $0.2 \leq r < 0.4$  weak,  $0.4 \leq r < 0.6$  moderate,  $0.6 \leq r < 0.8$  strong and  $0.8 \leq r < 1.0$  very strong. A  $p < 0.05$  were considered as statistically significant.

### 2.6. Ethical Considerations

This study was conducted following the guidelines outlined in the Helsinki Declaration. In the first part of the form, participants were presented with a short text informing them about the research and a section where they could declare their consent to participate research. Ethics commission approval was obtained from the Scientific Research Ethics Committee of Agri Ibrahim Cecen University, with decision number 226, dated 10.11.2022. Additionally, permission to conduct the study was obtained from the university rectorate.

### 3. Results

The study included a total of 460 individuals, of which 340 were female and 120 were male, all of whom were not infected with COVID-19. Figure 1 provides information about the process of including participants in the study.



**Figure 1.** Consort diagram of study participants

The mean score on the CORPD was determined to be  $36.2 \pm 7.2$ , while the mean score on the Emotional Eating Behaviour Scale was found to be  $71.1 \pm 19.1$ . Demographic characteristics of the participants and data regarding scale scores are presented in Table 1.

When the CORPD scale score data were analysed according to gender, both the CORPD fear-anxiety and CORPD total scores were significantly higher for female participants than for males (mean: 17.6 vs 16.1,  $p < 0.001$  and mean: 36.7 vs 34.7,  $p = 0.009$ ). There was no statistically significant difference between the two groups on the Emotional Eating Behaviour Scale (Table 2).

**Table 1.** General Information on demographic characteristics and scale scores (n=460)

	$\bar{x} \pm SD$	
<b>Age</b>	20.6±1.6	
	<b>n</b>	<b>(%)</b>
<b>Gender</b>		
Female	340	(73.9)
Male	120	(26.1)
<b>Smoke status</b>		
Yes	62	(13.5)
No	383	(83.3)
I was using it, I quit	15	(3.3)
<b>Alcohol consumption</b>		
Yes	24	(5.2)
No	430	(93.5)
I was using it, I quit	6	(1.3)
<b>Vaccination status</b>		
Yes	379	(82.4)
No	81	(17.6)
	$\bar{x} \pm SD$	
<b>CORPD Score</b>		
CORPD fear-anxiety	17.2 ± 3.5	
CORPD suspicion	19.0±4.8	
CORPD total	36.2±7.2	
<b>Emotional Eating Behaviour Scale</b>		
Eating in Response to Tension	24.8±8.8	
Eating to Cope with Negative Emotions	21.7±8.3	
Self-Control	15.6±2.8	
Controlling Eating in the Face of Stimuli	8.9±2.5	
Total Score	71.1±19.1	

*CORPD: COVID-19 Related Psychological Distress Scale,  $\bar{x} \pm SD$ : Mean ± Standard Deviation*

**Table 2.** Data on CORPD and Emotional Eating Behaviour Scale by gender

	Female (n=340)	Male (n=120)	p*
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	
<b>CORPD Score</b>			
CORPD fear-anxiety	17.6±3.4	16.1±3.4	<b>0.001</b>
CORPD suspicion	19.1±4.9	18.6±4.7	0.31
CORPD total	36.7±7.3	34.7±7.0	<b>0.009</b>
<b>Emotional Eating Behaviour Scale</b>			
Eating in Response to Tension	24.9±8.6	24.4±9.4	0.548
Eating to Cope with Negative Emotions	22.1±8.3	20.5±8.4	0.82
Self-Control	15.7±2.6	15.4±3.3	0.410
Controlling Eating in the Face of Stimuli	9.0±2.4	8.6±2.5	0.177
Total Score	71.8±18.8	69.0±19.9	0.177

CORPD: COVID-19 Related Psychological Distress Scale,  $\bar{x} \pm SD$ : Mean  $\pm$  Standard Deviation, \*Independent Samples Tests

The data on scale scores by participants' vaccination status are presented in Table 3. Upon examining the data in the table, it was observed that individuals who were vaccinated had higher levels of COVID-19 fear and anxiety (p=0.042).

**Table 3.** Data on scale scores by participants' vaccination status

	Vaccination		p*
	Yes (n=379)	No (n=81)	
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	
<b>CORPD Score</b>			
CORPD fear-anxiety	17.3±3.4	16.4±3.7	<b>0.042</b>
CORPD suspicion	19.0±4.8	18.8±5.1	0.674
CORPD total	36.4±7.1	35.3±7.8	0.209
<b>Emotional Eating Behaviour Scale</b>			
Eating in Response to Tension	24.9±8.7	24,3±9,2	0.616
Eating to Cope with Negative Emotions	21.7±8.4	21,6±8,1	0.925
Self-Control	15.6±2.7	15,9±3,4	0.352
Controlling Eating in the Face of Stimuli	8.9±2.5	8,7±2,5	0.544
Total Score	71.1±18.9	70,6±20,2	0.832

CORPD: COVID-19 Related Psychological Distress Scale,  $\bar{x} \pm SD$ : Mean  $\pm$  Standard Deviation, \*Independent Samples Tests

The data regarding the correlation between COVID-19 distress and emotional eating behaviour are presented in Table 4. Upon examination of the data in the table, it has been observed that there is a very weak positive correlation between participants' CORPD total scores and emotional eating behaviour (r:0.178, p<0.001). In

addition, while CORPD suspicion was found to be associated with the total and sub-dimension scores of the Emotional Eating Behaviour Scale ( $p < 0.05$ ), only the Controlling Eating in the Face of Stimuli sub-dimension score was found to be weakly associated with the CORPD fear-anxiety score ( $r: 0.208, p: < 0.001$ ).

**Table 4.** The correlation between CORPD and Emotional Eating Behaviour Scale

CORPD		CORPD	CORPD	CORPD
Emotional Eating Behaviour Scale		fear-anxiety	suspicion	total
Eating in Response to Tension	r	0.004	0.251	0.169
	p	0.926	<b>&lt;0.001</b>	<b>&lt;0.001</b>
Eating to Cope with Negative Emotions	r	-0.012	0.221	0.142
	p	0.795	<b>&lt;0.001</b>	<b>0.002</b>
Self-Control	r	-0.004	0.122	0.080
	p	0.940	<b>0.009</b>	0.087
Controlling Eating in the Face of Stimuli	r	0.208	0.145	0.197
	p	<b>&lt;0.001</b>	<b>0.002</b>	<b>&lt;0.001</b>
Total Score	r	0.023	0.250	0.178
	p	0.619	<b>&lt;0.001</b>	<b>&lt;0.001</b>

CORPD: COVID-19 Related Psychological Distress Scale

#### 4. Discussion

Our study was conducted with non-infected university students during the COVID-19 pandemic. The majority of participants were female and vaccinated individuals.

Upon evaluating the obtained results, it was found that the CORPD scores of females were higher compared to males. Consistently, similar findings have been reported both in the original version of the scale and its adapted Turkish version, indicating that females experience higher levels of COVID-19 psychological distress (Ay et al., 2022; Feng et al., 2020, Demir Gökmen & Sarıboğa 2021). Numerous studies have also confirmed our findings, suggesting that fear of COVID-19 is more severe among females (Alsharawy et al., 2021; Andrade et al., 2022; Broche-Pérez et al., 2022).

There are two main situations that cause individuals to fear during the pandemic period: the negative effects of the disease and distrust of vaccines (McNeil & Purdon, 2022). This situation has made individuals hesitant about whether to get vaccinated or not. The data we obtained show that the majority of individuals participating in the study were vaccinated. In addition, our study found that individuals with high levels of fear and anxiety about COVID-19 were more willing to get vaccinated. This shows that fear and distrust of the negative effects of the disease are more dominant than vaccine distrust. There are studies in the literature that provide similar results to our findings (Bendau et al., 2021; McNeil & Purdon, 2022).

The data we obtained confirmed our H1 hypothesis and concluded that there is a relationship between COVID-19 psychological distress and emotional eating behaviour even after the pandemic period. In particular, it was concluded that the CORPD sub-doubt dimension score is related to the emotional eating behaviour total score and sub-dimension scores and has an impact on the eating behaviour of individuals. In addition, the positive correlation between the eating in response to stimuli sub-dimension of the emotional eating behaviour scale and the CORPD total score and sub-dimension scores shows that the COVID 19 epidemic is an important stimulus that can affect the emotional eating behaviour of individuals. Many studies on the subject conducted during the pandemic period have obtained results similar to our findings (Dominte et al., 2022; Pak et al., 2022; Yoldas Iktac et al., 2022). Dominte et al., (2022) concluded in their study on adult women that fear of COVID-19 and negative emotional reactions were associated with emotional eating behaviour. Pak et al. (2022), who conducted a study on adults aged 18-67, showed that emotional eating was positively associated with intolerance of uncertainty, fear of COVID-19, and depression. Similarly, a study conducted on adults found a relationship between fear of COVID-

19 and emotional eating behaviour. However, this relationship disappeared when confounding factors were eliminated (Yoldas Ilktac et al., 2022). Although the studies conducted do not directly include the same population as our study, they are similar in terms of being an adult group.

Upon evaluating the data presented above, it can be observed that numerous studies have been conducted regarding the psychological effects of COVID-19 and emotional eating behaviour, yielding similar results. Publications on this topic rapidly increased since the onset of the COVID-19 pandemic, followed by a gradual decline in interest thereafter. The collection of study data two years after the onset of the pandemic, and its similarity to data obtained in the early stages of the pandemic, is significant. This suggests that the effects of the pandemic on psychology and eating behaviour are not short-term, but rather associated with long-term adverse health outcomes of the pandemic.

## 5. Conclusion

Our results showed that COVID-19 fear and anxiety were associated with emotional eating behaviour among university students. Our article also emphasizes that during pandemic periods, individuals are not only in physical danger but also face significant psychological problems. In this context, in future pandemics, the process should be evaluated from every aspect, and instead of only finding solutions to vital problems, the issue should be evaluated more comprehensively and from all aspects and solution suggestions should be offered. In particular, the long-term effects of the measures taken and quarantine practices on individuals should be investigated and the data obtained should be taken into consideration when making decisions.

Having psychologists and dietitians in the field at least as much as doctors and nurses during pandemic and quarantine periods can be an effective strategy in reducing the long-term negative effects of the pandemic. Individual nutrition counselling that can be given to individuals during pandemic periods will be effective in preventing various nutritional problems, especially emotional eating behavior. More importantly, before the pandemic occurs - during routine periods - individuals and the public should be educated and made aware of nutrition. A conscious public that has received nutrition education can exhibit correct nutritional behavior in special situations such as pandemics and contribute to the reduction of active workload during the pandemic period. Future research should further address the long-term psychological effects of the pandemic and its impact on eating behaviours. Such information will contribute to the development of supportive and preventive measures to improve the psychological well-being of individuals during the epidemic.

## Acknowledgments

I would like to thank my student Elif Ebru Çifçi, who helped in the data collection phase of the research.

## Disclosure statement

The author report there are no competing interests to declare.

## Funding details

This work was supported by the TUBITAK under Grant 1919B012111215.

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