Mediterranean Nursing and Midwifery

Mediterr Nurs Midwifery 2023; 3(1): 25-33 DOI:10.4274/MNM.2023.22123

ORIGINAL ARTICLE

The Mental Status of Nursing Students in COVID-19 Pandemic: A Cross-sectional Study

COVID-19 Pandemisinde Hemşirelik Öğrencilerinin Ruhsal Durumları: Kesitsel Bir Çalışma

Filiz Değirmenci, Ahu Aksoy Can, Asiye Çelebi, Duygu Vefikuluçay Yılmaz

Department of Obstetrics and Gynecology Nursing, Mersin University Faculty of Nursing, Mersin, Turkey

Abstract

Objective: The Coronavirus disease-2019 (COVID-19) pandemic has negatively affected the mental health of individuals as well as their physical health. The mental health of nurse candidates is also important in this process. Therefore, it was aimed to evaluate the anxiety and mental states of nursing students during the COVID-19 pandemic in this study.

Method: This descriptive and cross-sectional study was conducted with 323 students in the nursing department of a university. Research data were collected by using "state anxiety inventory" and "mental health continuity scale-short form".

Results: It was found that 78.9% of the nursing students were anxious in this period and there was a moderate inverse correlation between the state anxiety inventory and mental health continuity Scale scores of nursing students (r=-0.564; p<0.05).

Conclusion: It was determined that, as the anxiety levels of nursing students who switched from formal education to online education during the COVID-19 pandemic increased, their mental well-being worsened. In line with these results, it is recommended to organize programs and establish guidance to strengthen students' anxiety management and coping mechanisms in educational institutions.

Keywords: COVID-19, mental health, anxiety, nursing student

Öz

Amaç: Koronavirüs hastalığı-2019 (COVID-19) pandemisi bireylerin fiziksel sağlıklarının yanı sıra ruh sağlıklarını da olumsuz etkilemiştir. Hemşire adaylarının ruh sağlığı da bu süreçte önemlidir. Bu nedenle bu çalışmada hemşirelik öğrencilerinin COVID-19 pandemisi sürecindeki kaygı ve ruhsal durumlarının değerlendirilmesi amaçlanmıştır.

Yöntem: Tanımlayıcı ve kesitsel tipte olan bu araştırma, bir üniversitenin hemşirelik bölümünde öğrenim gören 323 öğrenci ile yapılmıştır. Araştırma verileri "durumluk kaygı envanteri" ve "ruh sağlığı sürekliliği ölçeği-kısa formu" kullanılarak toplanmıştır.

Bulgular: Hemşirelik öğrencilerinin %78,9'unun bu dönemde kaygılı olduğu ve hemşirelik öğrencilerinin durumluk kaygı envanteri ile ruh sağlığı süreklilik ölçeği puanları arasında orta düzeyde ters korelasyon olduğu saptandı (r=-0,564; p<0,05).

Sonuç: COVID-19 pandemisi sürecinde örgün eğitimden online eğitime geçiş yapan hemşirelik öğrencilerinin kaygı düzeyleri arttıkça ruhsal durumlarının kötüleştiği belirlendi. Bu sonuçlar doğrultusunda eğitim kurumlarında öğrencilerin kaygı yönetimi ve baş etme mekanizmalarını güçlendirmeye yönelik programların düzenlenmesi ve rehberlik oluşturulması önerilmektedir.

Anahtar Kelimeler: COVID-19, ruh sağlığı, kaygı, hemşirelik öğrencisi

* The results of this study were presented at the "3rd International Clinical Nursing Research Congress", December 8-10th, 2021 in Australia & Turkey.

Corresponding Author:
Ahu Aksoy Can, aksoyahu91@gmail.com

Received: November 11, 2022
Accepted: January 05, 2023

Cite this article as: Değirmenci F, Aksoy Can A, Çelebi A, Vefikuluçay Yılmaz D. The Mental Status of Nursing Students in COVID-19 Pandemic: A Cross-sectional Study. Mediterr Nurs Midwifery 2023; 3(1): 25-33

Introduction

The novel Coronavirus disease-2019 (COVID-19) is a global public health emergency caused by the severe acute respiratory syndrome-coronavirus (1). Spreading from China, COVID-19 was declared as a pandemic by the World Health Organization on March 11, 2020, after being recognized as a virus-caused epidemic in December 2019 (2). In addition to threatening physical health, COVID-19 has been a major source of stress for humans and has impacted their mental health, in relation with its very high spread rate (3-5). Similarly, many previous studies have revealed that individuals create strong stress responses and experience psychological changes during similar epidemics and other crises (6-8).

However, the policies that countries follow to prevent contagion during the pandemic process may also cause mental problems by restricting social life. In Turkey, preventive measures such as international travel bans, "stay at home" campaigns, and restrictions on social activities, gatherings and transportation were quickly put into practice (9). One of these measures was the transition to online education which has caused more stress, fear and anxiety, especially among students (1,10). In a study, it was determined that the anxiety levels of university students were correlated with daily life restrictions and the delays in commencement of education in schools, colleges and universities across the country (11). In addition, it has been stated that students who loss access to campus life and friends in this process could face mental and behavioral problems, including anxiety, stress, depression, substance addiction, sleeping difficulties, eating disorders and even suicide (12,13). Nursing students will have an important role in combating outbreaks such as COVID-19 that we will encounter in the future.

Considering that professional awareness begins to develop during the university years, there is a need for evidence-based practices to protect and maintain the mental health of nursing students and to develop stress coping mechanisms during the COVID-19 pandemic. In order to develop these measures, data concerning the current situation are needed. Therefore, this study was carried out to determine the possible relationship between nursing students' anxiety levels and mental health in the COVID-19 pandemic.

Main Points

- 78.9% of the nursing students were anxious in Coronavirus disease-2019 pandemic.
- Economic status and respondents' term in nursing school was only associated with anxiety.
- Problems concerning online education, and the type of device used to access online education were associated with both anxiety and mental status.
- There was a moderate inverse correlation between the state anxiety inventory and the mental health continuity scale scores of nursing students.

Material and Methods

Design

The type of this study is descriptive and cross-sectional.

Sample and Setting

The population of the research consisted of students in the nursing department in the spring semester of the 2019-2020 academic year (n=692). All students voluntarily and anonymously participated in this study. Students who did not accept to participate in the study and filled the questionnaire incompletely were not included in the study. Participants were selected by non-probability sampling and the study was completed with a total of 323 students.

Data Collection Procedures

The web-based questionnaire was sent to the academicians in the nursing faculty after ethical approvals were obtained. These faculty members were requested to send the questionnaire to the students they mentored in social media groups. Consent form was added to the first entry page of the questionnaire. In addition, students were informed about the research. Personal information was not included in the questionnaire on the basis of confidentiality. The questionnaire, which the students who signed the volunteer form had to fill, took an approximately 10 minutes. Research data were collected between 5 July-15 July 2020.

Study Variables and Measures

The research data were collected with an online questionnaire consisting of three parts: "Personal information form", "state anxiety inventory (SAI)" and "mental health continuity scale-short form (MHCS)" prepared by the researchers.

Personal Information Form

There were 12 questions regarding the descriptive information of the students: Age, gender, marital status, grade, income status, place of residence, presence of cohabiting persons (if any), presence of a person diagnosed with COVID-19 in their immediate vicinity, whether they were having problems with online education, and the problem(s) experienced in online education and tools used to combat these problems. These items were created with respect to the conclusions of various studies on this topic (10-12,14,15).

SAI

In order to determine the state anxiety level of the students, the SAI developed by Spielberger et al. in 1964 was used. The Turkish validity and reliability studies of the inventory were carried out by Öner and Le Compte (16). The inventory consists of 20 items that determine how the individual feels at a particular moment. Each items in the inventory is answered in a four-point Likert type fashion, and scores vary between 1-4 points ("do not agree/none" to "completely agree", respectively) according to the intensity of the emotions expressed. Ten items (1, 2, 5, 8, 10, 11, 15, 16, 19, and 20) are scored inversely. The lowest score that can be obtained from the inventory is "20" and the highest score is "80". When calculating the total score of the scale, 50 points are

added to the difference between the scores obtained from direct statements and reverse statements. In the evaluation of the inventory, the cut-off score was determined as 40. Accordingly, it was accepted that those who scored below 40 do not experience anxiety, and those who scored above 40 were experiencing anxiety. Test-retest coefficients of the inventory were 0.16-0.54. The coefficients reflecting the internal consistency and test homogeneity, calculated with alpha correlations, were found to be 0.83-0.92 (16).

MHCS

In the study, the short form of the MHCS was used to determine the emotional, mental and social well-being of the students. This scale was developed by Keyes in 2002, and its Turkish validity and reliability study was conducted by Demirci and Akın (17). The MHCS is organized in three dimensions with 14 items which are responded to in a six-point Likert-type scale. The "How often have you felt the following emotions over the past month?" question was evaluated as follows: "Never (0), Once or twice (1), About once a week (2), About 2-3 times a week (3), Almost every day (4), Every day (5)". There is no distracting or inversely-scored items in the scale. The scale has three sub-dimensions: "Emotional Well-being", "Psychological Well-being", "Social Well-being", and the scores for these sections as well as total mental health continuity are quantified the scores obtained. High scores in each sub-dimension of the scale (and the total score) indicate well-being. The Cronbach's alpha internal consistency reliability coefficients of the mental health continuity scale were found to be 0.84 for the emotional well-being subscale, 0.78 for the social well-being subscale, 0.85 for the psychological well-being subscale, and 0.90 for the whole scale (17).

Statistical Analysis

SPSS (Statistical Package for Social Science) version 20.0 software was used in the analysis of the data. Normality and homogeneity assumptions (Shapiro Wilk and Levene test) were checked before the variables were evaluated. While analyzing the data, parametric tests were used. That is, the independent samples t-test (Student's t-test) was used for the comparison of two groups, the One-Way Analysis of Variance test was used for the comparison of the means of more than two groups and the Pearson Correlation Coefficient was calculated for the evaluation of the directional relationship between two continuous variables. Number, percentage, mean and standard deviation values are given as descriptive statistics. A value of <0.05 was accepted as significance level in all tests.

Ethical Consideration

All permissions were obtained from the Republic of Turkey Ministry of Health Directorate General of Health Services on 10/05/2020 and from the Social and Human Sciences Ethics Committee of Mersin University on 03/07/2020 before the data collecting.

Results

The students' mean age is 21.23±1.85 (range 18-34) years and the average number of cohabiting individuals in students' residence is 5.62±2.51 (range 1-17). It was determined that 67.8% of the participants were female, almost all (98.1%) were single, 31% were in the third year of nursing school, 62.2% reported having equal income and expense, 47.7% resided in a provincial center (urban) and 93.8% lived with their family.

It was determined that 16.4% of the participants had an individual diagnosed with COVID-19 in their immediate surroundings, and 43% were experiencing problems with the online education system. It was determined that 54.7% of the participants who stated that they had problems in online education did not find it to be sufficient and/or efficient. It was found that 69.3% of the participants also used smartphones for distance education. Additionally, 78.9% of the participants were anxious.

When the scores of the participants from the scales is examined, it is seen that the total score obtained from the SAI is 49.04±11.09; the score obtained from the MHCS is 26.09±16.41; the score obtained from the emotional well-being sub-dimension was 5.69±3.63; the score obtained from the social well-being sub-dimension is 7.78±6.02 and the score obtained from the psychological well-being sub-dimension is 12.60±8.07 (Table 1).

The distribution of the scores of the SAI, MHCS and sub-dimensions according to some socio-demographic characteristics of the students is presented in Table 2.

Table 1.
Participants' Age, Cohabiting Status, and SAI and MHCS Total and Subdimension Scores

Parameters	Number of items	Minimum	Maximum	$\bar{X}$ ± SD	Cronbach α
SAI score	20	20[a]-21[b]	80[a]-80[b]	49.04±11.09	0.932
MHCS total	14	0[a]-0[b]	70[a]-66[b]	26.09±16.41	0.959
MHCS emotional well-being	3	0[a]-0[b]	15[a]-15[b]	5.69±3.63	0.910
MHCS social well-being	5	0[a]-0[b]	25[a]-25[b]	7.78±6.02	0.892
MHCS psychological well-being	6	0[a]-0[b]	30[a]-30[b]	12.60±8.07	0.942

[a] Theoretical range, [b] Observed range, SD=standard deviation, SAI=state anxiety inventory, MHCS=mental health continuity scale-short form

Table 2.
The Distribution of SAI Scores and MHCS Total and Subdimension Scores with Respect to Various Characteristics of Patients

		SAI Total score		**MHCS Emotional well-being**	
Characteristics	**n**	**$\bar{X}$ ± SD**	**t-test/p**	**$\bar{X}$ (±SD)**	**t-test/p**
Sex[c]					
Female	219	49.30±10.93	0.617/0.538	26.72±16.24	0.999/0.319
Male	104	48.49±11.45		24.76±16.76	
Marital status[c]					
Married	6	48.33±18.09	0.158/0.875	22.50±19.21	0.541/0.589
Single	317	49.05±10.96		26.16±16.38	
Year in nursing school[d]					
1st year	76	46.96±10.20	**5.544/0.001***	28.03±17.37	1.500/0.214
2nd year	75	48.42±10.33		27.80±16.79	
3rd year	100	52.62±10.80		23.4±15.96	
4th year	72	46.91±12.09		25.93±15.40	
Economic status[d]					
Income less than expense	101	50.99±11.79	**4.124/0.017***	24.58±17.41	0.640/0.528
Eqaul income and expense	201	48.61±10.61		26.70±15.60	
Income more than expense	21	43.80±10.35		27.47±19.20	
Place of residence[d]					
Rural	62	50.85±10.48	1.106/0.332	23.72±17.14	0.798/0.451
Provincial district	107	48.28±12.45		26.58±16.54	
Provincial center	154	48.84±10.28		26.70±16.04	
Cohabiting individuals[d]					
Alone	8	50.75±14.00	1.049/0.351	22.25±17.96	2.475/0.086
Friend(s)	12	44.66±9.97		36.81±18.56	
Family	303	49.17±11.05		25.80±16.21	
Individual with COVID-19 diagnosis in immediate surroundings[c]					
Yes	53	50.18±11.28	0.822/0.412	27.71±16.51	0.787/0.432
No	270	48.81±11.06		25.77±16.40	
Experience of problems pertaining to online education					
Yes, previously or currently	139	52.44±11.25	**-4.965/<0.001***	23.29±14.89	**2.743/0.006***
No, neither now nor previously	184	46.47±10.27		28.20±17.21	
Problem experienced concerning online education (n=139)[d]					
Insufficient and/or inefficient	76	52.15±11.74	0.784/0.458	24.72±15.86	0.836/0.436
Connection-related problems	41	51.53±10.68		22.07±14.38	
Lack of device or internet	22	55.13±10.63		20.63±12.15	
Device used to access online education[d]					
Smart phone	224	50.50±10.77	**11.617/<0.001***	24.30±15.70	**7.422/0.001***
Personal computer	92	44.81±10.61		31.21±17.37	
Someone elses device, or internet cafe	7	58.00±11.53		16.00±8.40	
Anxiety status[c]					
Anxiety absent (BCS <40)	68	33.77±10.77	**-0.25.002/<0.001***	40.54±14.14	**9.163/<0.001***
Anxiety present (BCS ≥40)	255	53.11±10.61		22.23±14.76	

*[c] Independent t-test, [d] One-Way Variance Analysis *p<0.05, BCS=birth comfort service, COVID-19=Coronavirus disease-2019, SD=standard deviation, SAI=state anxiety inventory, MHCS=mental health continuity scale-short form*

	Social well-being		Psychological well-being			
	$\bar{X}$ (±SD)	t-test/p	(±SD)	t-test/p	$\bar{X}$ (±SD)	t-test/p
	5.84±3.53	1.062/0.289	7.72±5.86	-0.294/0.769	13.15±8.20	1.777/*0.076
	5.38±3.85		7.93±6.37		11.45±7.71	
	5.16±4.07	0.360/0.719	6.33±7.17	0.597/0.551	11.00±8.43	0.491/0.623
	5.70±3.63		7.81±6.01		12.63±8.07	
	6.28±3.63	**3.876/0.010***	8.51±6.41	2.037/0.109	13.23±8.67	0.348/0.791
	6.34±3.89		8.54±6:19		12.90±7.71	
	4.74±3.36		6.6±5.85		12.09±8.15	
	5.72±3.52		7.86±5.51		12.34±7.77	
	5.27 (±3.85)	0.976/0.378	7.33±6.34	0.420/0.657	11.97±8.46	0.505/0.604
	5.88 (±3.47)		7.98±5.86		12.84±7.67	
	5.90 (±4.08)		8.14±6.23		13.42±9.91	
	4.88 (±3.90)	1.998/0.137	7.19±6.21	0.549/0.578	11.64±8.10	0.609/0.554
	5.77 (±3.51)		8.19±6.14		12.61±8.14	
	5.96 (±3.58)		7.74±5.88		12.98±8.02	
	4.37 (±3.73)		6.37±7.85		11.50±7.42	
	7.83 (±3.78)	2.651/0.072	12.50±7.07	**4.052/0.018***	15.66±8.73	0.956/0.385
	5.64 (±3.61)		7.64±5.87		12.51±8.06	
	5.69 (±3.59)	0.003/0.997	8.35±6.57	0.751/0.453	13.66±8.10	1.039/0.300
	5.69 (±3.65)		7:67±5.92		12.40±8.06	
	4.96 (±3.31)	**3.247/0.001***	6.65±5.53	**3.027/0.003***	11.67±7.65	1.828/0.069
	6.25 (±3.77)		8.64±6.25		13.30±8.32	
	5.32 (±3.45)	1.079/0.343	6.98 (±5.74)	0.541/0.583	12.40±8.32	0.765/0.467
	4.63 (±3.22)		6.60 (±5.48)		10.82±7.26	
	4.31 (±2.98)		5.59 (±4.92)		10.72±5.73	
	5.25 (±3.59)	**10.638/<0.001***	7.43 (±5.86)	**4.755/0.009***	11.61±7.53	6.873/0.001*
	7.01 (±3.46)		9.02 (±6.36)		15.18±8.88	
	2.71 (±1.49)		2.85 (±1.86)		10.42±6.97	
	9.07±2.99	**9.801/<0.001***	12.41±5.92	**7.740/<0.001***	19.05±7.26	8.132/<0.001*
	4.79±3.24		6.55±5.43		10.88±7.39	

Table 3.
The Relationships Between Age, Number of Cohabiting Individuals and Scores Obtained from the SAI and MHCS (n=323)

	SAI	MHCS total	MHCS emotional well-being	MHCS social well-being	MHCS psychological well-being
	r	r	r	r	r
SAI	1	-	-	-	-
MHCS total	**-0.564***	1	-	-	-
MHCS emotional well-being	**-0.632***	**0.870***	1	-	-
MHCS social well-being	**-0.501***	**0.925***	**0.753***	1	-
MHCS psychological well-being	**-0.487***	**0.951***	**0.755***	**0.794***	1

*r=Pearson correlation coefficient, *p<0.05, SAI=state anxiety inventory, MHCS=mental health continuity scale-short form*

In the study, it was found that the SAI score and the emotional well-being sub-dimension score of the MHCS demonstrated significant relationships with the respondents' term in nursing school. Third grade students' state anxiety levels were higher and their emotional well-being levels were lower (p<0.05). The difference between the SAI score averages according to income levels of the participants also showed statistically significant relationships. Accordingly, the state anxiety levels of the participants whose income was lesser than their expense was found to be significantly higher (p<0.05). In addition, the difference was found to be statistically significant between the MHCS social well-being sub-dimension scores of the participants with cohabiting any individuals and participants living with their friends had better mental well-being (p<0.05).

Table 2 shows the distribution of the scores of the nursing students in the SAI and MHCS and its sub-dimensions according to the COVID-19 pandemic (with respect to the online education system utilized in this period). A statistically significant difference was found between the SAI, MHCS total, emotional and social well-being mental health scores of the students with and without problems concerning online education. Accordingly, while the state anxiety levels of students experiencing problems in online education were found to be high, their general mental health and their mental health levels related to emotional and social well-being were found to be lower (p<0.05). When the type of device used to access online education was examined, the distribution of scores obtained from SAI, MHCS and all sub-dimensions of MHCS demonstrated statistically significant differences among the groups. In the study, the state anxiety scores were higher among students who used someone else's device or went to an internet cafe to access online education, and these students also had significantly worse general mental health (<0.05).

We determined that there was a statistically significant difference between MHCS and all sub-dimension scores of MHCS according to the anxiety status of the participants. The MHCS total score and all sub-dimension scores of the MHCS were lower among subjects with anxiety (p<0.05) (Table 2).

In our study, it was determined that there was a significant moderate inverse correlation between the SAI and MHCS scores of the participants; the higher the score from the SAI, the lower the MHCS score (r=-0.564; p<0.05). Similarly, there was a significant strong inverse correlation between SAI and emotional well-being score (r=-0.632), while there was a significant moderate inverse relationship between SAI and social well-being (-0.501) and psychological well-being (-0.487). It was found that the higher the score obtained from the SAI, the lower the scores obtained from the sub-dimensions of MHCS (all p<0.05) (Table 3).

Discussion

In this study, the anxiety levels, mental states and socio-demographic characteristics of nursing students, the effects of the COVID-19 epidemic and online education on these parameters, and the relationships between anxiety levels and mental well-being were investigated in the light of literature. The COVID-19 pandemic is a public health problem that has a significant mental, social and economic impact, as well as its undebatable effects on physical health (18). The determinants of these affected areas can be listed as insecurity, uncertainty, emotional isolation, stigma, economic loss, loss of employment, loss of school access and the lack of sufficient resources for medical health. These situations experienced during the pandemic can turn into a series of emotional reactions and unhealthy behaviors, including stress, anxiety, depression, fear and post-traumatic stress disorder in individuals (19). The pandemic, which has had unprecedented affects on students, has caused many universities worldwide to close and switch to long-distance education through online platforms, thus causing more anxiety among students. In studies conducted with university students in China, it has been reported that COVID-19 and lockdown negatively influenced students' psychological well-being and

increased their anxiety levels (1,10). In a study conducted in Malaysia, it was determined that the COVID-19 epidemic reduced socio-psychological well-being and increased anxiety levels among Malaysian university students (20). Similarly, Gao et al. (21) found that the frequency of depression (48.3%), anxiety (22.6%) and comorbidity of depression and anxiety (19.4%) in the Chinese population was much higher than in previous studies. In our study, the mean score from the MHCS was found to be 26.09±16.41. Considering that the maximum score that can be obtained from the scale is 70, it can be said that the mental status of the students is rather poor. The prevalence of anxiety, one of the important determinants of mental health, has long been in an increasing trend in the youth (22,23). Many factors can affect anxiety such as age, gender, economic status and medical problems (22,24,25). Especially situations such as epidemics and infectious diseases have been shown to increase the anxiety levels of individuals even more (26). In this study, it was determined that 78.9% of the nursing students experienced anxiety according to the cut-off score of the inventory [40 p] and the overall mean score of these students was 49.04±11.09. Sögüt et al. (27), in their study with midwifery students, reported that only 5% of students had moderate or high anxiety levels. Islam et al. (28) found that 18.1% of university students experienced severe anxiety in a study they conducted. An alarming result pertaining to the mental health status of the youth was reported in a decade-old study which had found that approximately one third of young individuals met the DSM-IV anxiety criteria and the frequency of anxiety increased toward the age of 18 (22). As can be seen from such data, young people may have high anxiety levels at any given time, and it is evident that further stress can only worsen the long-standing trend shown in previous and current studies. In parallel with the result of our study, it is expected that nursing students have high anxiety levels in an extraordinary period such as a pandemic. This finding can be explained by the fact that the data collection process of the study took place in the later stages of the pandemic, and therefore, the time spent under pandemic-related restrictions and problems were at an all-time high. It is evident that such stress can cause fear and anxiety about the future, could affect students' prospects, and ultimately lead to uncertainty regarding educational life.

During the COVID-19 pandemic, there has been a general shift from traditional face-to-face teaching to online teaching. Two main estimates of the potential impact of the COVID-19 outbreak on online education have been made. The first is that the education of students will be inefficient, and the second is that patients' financial status will be negatively affected (29).

In our study, anxiety levels were higher in students who had low economic status, those who experienced problems in online education and individuals who had to use someone else's device or needed to go to an internet cafe to access online education. In a review written by Fetzer et al. (30) about coronavirus perception and economic anxiety during the pandemic process (based on two data sets in the USA), the authors emphasized that economic anxiety had increased among individuals since the beginning of COVID-19 and that one of the most important determinants of anxiety was indeed financial status. Cao et al. (11) found that worries about the economic and academic impacts of the COVID-19 pandemic were positively associated with the anxiety levels of university students. Islam et al. (28) found that students attending supplementary classes before the quarantine period and students who were concerned about their academic success were respectively 1.4 and 1.8 times more likely to show moderate or severe anxiety symptoms compared to other students. In a study conducted with medical faculty members in Iran, 62.5% of the participants stated that they preferred to use online and face-to-face education together. In the same study, it was determined that the problems experienced in online medical education during the COVID-19 pandemic were related to communication (59%), the use of technological tools (56.5%), online experience (55%), and anxiety or stress associated with the pandemic (48%) (31). According to a report prepared by Temple University, it was emphasized that university students became financially vulnerable and some students were worried that, after the pandemic, they could no longer afford university education (32).

As it can be clearly understood from both our findings and other studies, the transition from formal education to online education during the pandemic process has had negative effects on both the daily life and mental health of students. In addition, social isolation caused by COVID-19 measures has led to economic crises all over the world. Accordingly, it is an expected result that individuals with lower socio-economic status will be more severely affected by this crisis, both physically and psychologically. Since students with insufficient income may have difficulty in obtaining online education materials and accessing the internet, their anxiety levels may increase and their mental health may be negatively affected to a greater degree.

It was determined that there was a moderately significant negative correlation between the SAI and MHCS scores of the participants, and as the scores they got from the SAI increased, the scores they got from the MHCS decreased. Anxiety is a very important criterion in the assessment of mental health and is considered under the category of emotional disorders (33). The COVID-19 pandemic has also affected students' mental health in many ways, including their anxiety. In this context, the finding obtained in our study is an expected result.

Study Limitations

The first limitation of this study is that the scales used are generally measurement tools used in a clinic. Another limitation is the measurement of anxiety and other mental well-being at a certain time. The last limitation of the study is related to the fact that not all of the students have access to a smart phone or computer, hence online access.

Conclusion

In our study, it was determined that the mean SAI score was 49.04±11.09 in nursing students and 78.9% of them experienced anxiety according to the cut-off score of the inventory. Additionally, the mean total score from the MHCS was 26.09±16.41, indicating poor mental well-being. It was found that students with a low socio-economic status had significantly greater levels of anxiety, while students living alone had worse mental well-being. In addition, it has been determined that students who experienced problems in online education and those who needed to use someone else's device or went to internet cafes to access online education had higher anxiety and worse mental health. Finally, it was determined that there was a moderate inverse relationship between SAI and MHCS scores; that is, as the score obtained from SAI increased (indicating worse anxiety), the score obtained from MHCS decreased (indicating worse mental well-being).

Recommendations and Implications

The COVID-19 pandemic, which has had a profound impact throughout world, affected university students in many ways, which can be listed as follows: Having to switch from the formal education they were accustomed to, getting used to online education which they had never experienced before, unexpectedly and suddenly leaving their social life in the campus environment and friends, and the need for electronic devices to continue their education (causing excess financial burden). These factors appear to have negatively affected the mental state of the students, and therefore, the following recommendations should be evaluated to maintain and protect the mental health of nursing students:

- Establishing the necessary technical infrastructure throughout the country to provide uninterrupted online education,

- Creating online platforms for practice, especially in nursing faculties where applied education is crucial,

- Developing projects and opportunities in order to mitigate the financial problems of students and to support them in providing the necessary tools for online education,

- Organizing public service announcements and large-scale events that will raise awareness on this matter in order to increase the quantity and individual sum of scholarships provided to university students,

- Organizing programs that will enable students to cope with anxiety and mental problems and creating guidance in educational institutions.

Ethics Committee Approval: All permissions were obtained from the Republic of Turkey Ministry of Health Directorate General of Health Services on 10/05/2020 and from the Social and Human Sciences Ethics Committee of Mersin University on 03/07/2020 before the data collecting.

Informed Consent: Informed consent was obtained.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – F.D., A.A.C., A.Ç., D.V.Y.; Design – F.D., A.A.C., A.Ç., D.V.Y.; Analysis and/or Interpretation – F.D., A.A.C., D.V.Y.; Writing Manuscript – F.D., A.A.C., A.Ç., D.V.Y.; Revision – F.D., D.V.Y.; Final Work – A.A.C., A.Ç., D.V.Y.

Declaration of Interests: The authors declare that they have no competing interest.

Funding: The authors declare that this study had received no financial support.

References

1. Bao Y, Sun Y, Meng S, Shi J, Lu L. 2019-nCoV epidemic: address mental health care to empower society. Lancet 2020;395(10224):e37-e38. [Crossref]
2. World Health Organization (WHO), Director-General's remarks at the media briefing on 2019- nCoV on 11 February 2020. Available from: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020. Accessed August 19, 2020. [Crossref]
3. Zolotov Y, Reznik A, Bender S, Isralowitz R. COVID-19 fear, mental health, and substance use among Israeli university students. Int J Ment Health Addict 2020;20(1):230-236. [Crossref]
4. Wu W, Zhang Y, Wang P, Zhang L, Wang G, Lei G, et al. Psychological stress of medical staffs during outbreak of COVID‐19 and adjustment strategy. J Med Virol 2020;92(10):1962-1970. [Crossref]
5. Wang G, Zhang Y, Zhao J, Zhang J, Jiang F. Mitigate the effects of home confinement on children during the COVID-19 outbreak. Lancet 2020;395(10228)945-947. [Crossref]
6. Mak IWC, Chu CM, Pan PC, Yiu GC, Lee VL. Long-term psychiatric morbidities among SARS survivors. Gen Hosp Psychiatry 2009;31(4)318-326. [Crossref]
7. Lee AM, Wong JG, McAlonan GM, Cheung V, Cheung C, Sham PC, et al. Stress and psychological distress among SARS survivors 1 year after the outbreak. Can J Psychiatry 2007;52(4):233-240. [Crossref]
8. Kwek SK, Chew WM, Ong KC, Ng AWK, Lee LSU, Kaw G, et al. Quality of life and psychological status in survivors of severe acute respiratory syndrome at 3 months postdischarge. J Psychosom Res 2006;60(5):513-519. [Crossref]
9. Sağlık Bakanlığı, Halk Sağlığı Genel Müdürlüğü (2020), Yeni Koronavirüs Hastalığı, Türkiye COVID-19 Durum Raporu [Ministry of Health, General Directorate of Public Health (2020) New Coronavirus Disease, Turkey COVID-19 Situation Report]. Available from: https://COVID19bilgi.saglik.gov.tr/tr/ Accessed August 19, 2020. [Crossref]
10. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. Int J Environ Res Public Health 2020;17(5):1729. [Crossref]

11. Cao W, Fang Z, Hou G, Han M, Xu X, Dong J, et al. The psychological impact of the COVID-19 epidemic on college students in China. Psychiatry Res 2020;287:112934. [Crossref]
12. Zhai Y, Du X. Addressing collegiate mental health amid COVID-19 pandemic. Psychiatry Research 2020;288:113003. [Crossref]
13. Sahu P. Closure of universities due to coronavirus disease 2019 (COVID-19): Impact on education and mental health of students and academic staff. Cureus 2020;12(4):e7541. [Crossref]
14. Li S, Wang Y, Xue J, Zhao N, Zhu T. The impact of COVID-19 epidemic declaration on psychological consequences: a study on active Weibo users. Int J Environ Res Public Health 2020;17(6):2032. [Crossref]
15. Liang L, Ren H, Cao R, Hu Y, Qin Z, Li C, et al. The effect of COVID-19 on youth mental health. Psychiatric Q 2020;91(3):841-852. [Crossref]
16. Öner N, Le Compte A. Süreksiz Durumluk/Sürekli Kaygı Envanteri El Kitabı, 1st Ed., İstanbul, Boğaziçi Üniversitesi Yayınları, 1983:1-26. [Crossref]
17. Demirci I, Akın A. The validity and reliability of the mental health continuum short form. Ankara University, Journal of Faculty of Educational Sciences 2015;48(1):49-64. [Crossref]
18. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The socio-economic implications of the coronavirus and COVID-19 pandemic: a review. Int J Surgery 2020;75:185-193. [Crossref]
19. Pfefferbaum B, North CS. Mental health and the COVID-19 pandemic. N Engl J Med 2020;383(6):510-512. [Crossref]
20. Sundarasen S, Chinna K, Kamaludin K, Nurunnabi M, Baloch GM, Khoshaim HB, et al. Psychological impact of COVID-19 and lockdown among university students in Malaysia: Implications and policy recommendations. Int J Environ Res Public Health 2020;17(17):6206. [Crossref]
21. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. PLoS One 2020;15(4):e0231924. [Crossref]
22. Merikangas KR, He JP, Burstein M, Swanson SA, Avenevoli S, Cui L, et al. Lifetime prevalence of mental disorders in US adolescents: results from the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A). J Am Acad Child Adolesc Psychiatry 2010;49(10):980-989. [Crossref]
23. Siegel RS, Dickstein, D.P. Anxiety in adolescents: update on its diagnosis and treatment for primary care providers. Adolesc Health Med 2011;3:1-16. [Crossref]
24. Moghanibashi-Mansourieh A. Assessing the anxiety level of Iranian general population during COVID-19 outbreak. Asian J Psychiatr 2020;51:102076. [Crossref]
25. Priego-Parra BA, Triana-Romero A, Pinto-Gálvez SM, Ramos CD, Salas-Nolasco O, Reyes MM, et al. Anxiety, depression, attitudes, and internet addiction during the initial phase of the 2019 coronavirus disease (COVID-19) epidemic: A cross-sectional study in México. MedRxiv 2020. [Crossref]
26. Pappas G, Kiriaze IJ, Giannakis P, Falagas ME. Psychosocial consequences of infectious diseases. Clin Microbiol Infect 2009;15(8):743-747. [Crossref]
27. Sögüt S, Dolu İ, Cangöl E. The relationship between COVID-19 knowledge levels and anxiety states of midwifery students during the outbreak: A cross-sectional web-based survey. Perspect Psychiatr Care 2021;57(1):246-252. [Crossref]
28. Islam MS, Ferdous MZ, Potenza MN. Panic and generalized anxiety during the COVID-19 pandemic among Bangladeshi people: An online pilot survey early in the outbreak. J Affect Disord 2020;276:30-37. [Crossref]
29. Kamenetz A. 'Panic-gogy': teaching online classes during the coronavirus pandemic. (2020). Available from: https://www.npr.org/2020/03/19/817885991/panic-gogy-teaching-onlineclasses-during-the-coronavirus-pandemic Accessed November 03, 2020. [Crossref]
30. Fetzer T, Hensel L, Hermle J, Roth C. Coronavirus perceptions and economic anxiety. Review of Economics and Statistics 2021;103(5):968-978. [Crossref]
31. Rajab MH, Gazal AM, Alkattan K. Challenges to online medical education during the COVID-19 pandemic. Cureus 2020;12(7):e8966. [Crossref]
32. How Does the Pandemic Affect U.S. College Students? Temple university, philadelphia. Available from: https://www.pbs.org/wnet/amanpour-and-company/video/how-does-the-pandemic-affect-u-s-college-students/) Accessed November 03, 2020. [Crossref]
33. Shackman AJ, Tromp DPM, Stockbridge MD, Kaplan CM, Tillman RM, Fox AS. Dispositional negativity: An integrative psycho-logical and neurobiological perspective. Psychol Bull 2016;142(12):1275-1314. [Crossref]