



# Mental Health of Nursing Students and Associated Factors during the COVID-19 Pandemic: A Cross-sectional Web-based Study

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## Abstract

**Background:** Specific conditions arising from the COVID-19 pandemic may affect the mental health of nursing students.

**Objectives:** This study aimed to investigate the mental health of nursing students and associated factors during the COVID-19 pandemic at Ahvaz and Kermanshah Universities of Medical Sciences in Iran.

**Methods:** This cross-sectional study was conducted on 384 nursing students at Ahvaz and Kermanshah Universities of Medical Sciences in Iran from May 10, 2021, to June 26, 2021. The required data were collected using a web-based questionnaire via social networks, such as WhatsApp and Telegram. Symptom Checklist-25 (SCL-25) was used to measure mental health. Descriptive statistics and stepwise linear regression were used to analyze the data.

**Results:** The mean total mental health score was  $47.48 \pm 16.03$ , and 235 (61.0%) students had good mental health, 124 (32.2%) cases had suspected mental disorders, and 26 (6.8%) respondents had severe mental disorders. Using the stepwise regression method, four variables, including gender, history of mental illness, history of coronavirus infection or being suspected of having coronavirus, and level of trust in statistics about the incidence and mortality rate of COVID-19 had the greatest impact on mental health modeling.

**Conclusion:** In general, the COVID-19 pandemic may have a negative impact on the mental health of nursing students. Therefore, it is very important to identify and consider the factors that can reduce their mental distress.

**Keywords:** COVID-19, Iran, Mental health, Nursing students

## 1. Background

The first cases of pneumonia caused by the new Coronavirus were detected in Wuhan, China, in late December 2019, and in 2020, the disease was declared a global pandemic by the World Health Organization (WHO) (1). In Iran, the Ministry of Health also detected two cases of COVID-19 in Qom, central Iran, on February 19, 2020, which were the first cases of the disease in the country. The disease spread so rapidly in Iran that by March 5, 2020, all 31 provinces in the country were infected with the virus (2). At the time of the present study, more than 100 patients with COVID-19 died daily in the country (3) and by August 25, 2022, the total number of deaths caused by this virus in the country reached 143,612 people. Furthermore, a total of 7,518,974 patients have been diagnosed with the disease until this time (4).

Infectious diseases can threaten human survival, so their spread often has devastating social and psychological consequences. The reasons for this include high mortality rates, inadequate knowledge about emerging infections, the spread of misinformation, and the suffering caused by these

diseases (5). As an emerging infectious disease, COVID-19 has also had an adverse impact on the mental health status of the general population. One of the reasons for this is the quarantine and social distance period, which in itself can cause anxiety, fear, sadness, chronic stress, physical distance from loved ones, and loneliness. Therefore, all of these may have long-term psychological effects (6). This issue was so serious that WHO issued a document on March 18, 2020, expressing its concern about mental health during the pandemic and its psychosocial consequences (7).

Similarly, the results of various studies in Iran that investigated the psychological impact of the outbreak of COVID-19 also showed that the general population of Iran was suffering from some major psychological problems, such as anxiety, stress, and depression at the time of this pandemic (8, 9). As an example, Reskati et al. (2021) in their study aimed at examining the mental health status of the general population of Iran during the COVID-19 pandemic concluded that 22.5% of the individuals showed moderate-to-severe depression, 38.5% of the cases were suffering from moderate-to-severe anxiety, and 47.2% of the respondents were experiencing

moderate-to-severe stress (9).

Among the general population of any society, students are considered a vulnerable population whose mental health status became a serious problem during the COVID-19 pandemic (10). In support of this, the results of the study by Wang et al. (2020) showed that during the pandemic, 48.14% of college students reported a moderate-to-severe level of depression, 38.48% reported a moderate-to-severe level of anxiety, and 18.04% showed suicidal thoughts (10).

As a critical group of the student population, the COVID-19 pandemic may have caused more anxiety and psychological distress to nursing students since even in non-pandemic and normal situations, they are experiencing high levels of anxiety due to the difficulty of instructional resources, the considerable amount of hours of study, as well as heavy emotional and physical workload of nursing programs (11). The results of various studies also support this claim. Tanji et al. (2021) reported the prevalence of psychological distress among nursing students during the COVID-19 pandemic at 58.5% (12). Moreover, the results of a study by Alsolais et al. (2021) showed that during the pandemic, approximately 43.3%, 37.2%, and 30.9% of nursing students experienced degrees of depression, anxiety, and stress, respectively (13). In addition, based on the results of another study, 39.2% and 51.5% of nursing students had experienced moderate to severe anxiety during the COVID-19 pandemic, respectively (11).

Anxiety and psychological distress can have adverse consequences for nursing students. Evidence shows that those students who experience stress are more prone to health problems, sleep disorders, and academic burnout. Sharififard et al. (2020) concluded in their study that nursing students with higher levels of anxiety are more likely to experience academic burnout (14). The results of a study conducted by Tanji et al. (2021) also showed a strong relationship between insomnia and psychological distress in nursing students (12).

Several factors can be related to the mental health of nursing students during the COVID-19 pandemic. The results of various studies have identified some of them so far, among which the following can be noted: gender, having physical or mental chronic diseases, and being worried about himself/herself or family members being infected with the virus. The results of a study carried out by Zukhra et al. (2021) showed that during the COVID-19 pandemic, female nursing students reported more anxiety symptoms than male students (15). According to the results of another study, a generalized anxiety disorder in nursing students was significantly related to having physical and mental chronic diseases (16). In addition, in another study, researchers concluded that nursing students who were more worried about themselves

and their family members being infected with the virus had experienced higher levels of anxiety (11).

Nursing students play a key role in improving the health of the community, so it is highly important to pay attention to their mental health. On the other hand, a review of the literature showed that at the time of the present study, most of the studies conducted in the field of mental health of nursing students during the COVID-19 pandemic were from countries other than Iran. Considering the fact that Iran has a different geographical, economic, social, and cultural situation, compared to other countries, and there are even great cultural, social, and economic differences among different regions of the country, it seems very necessary to evaluate the mental health of nursing students in Iran.

## 2. Objectives

Since poor mental health in nursing students may negatively affect their quality of life, academic performance, and ability to play a professional role, the present study aimed to determine the mental health of nursing students and its associated factors during the COVID-19 pandemic in Ahvaz and Kermanshah Universities of Medical Sciences in Iran.

## 3. Methods

### 3.1. Study design and participants

This web-based cross-sectional study was conducted from May 10, 2021, to June 26, 2021, at Ahvaz and Kermanshah Universities of Medical Sciences, Iran, as research samples were available there. It should be noted that the sampling in the current study started when the country was in the fourth wave of COVID-19, which was more dangerous than the previous waves. Furthermore, the sampling in our study ended when the country had just left the fourth wave of COVID-19. In other words, on May 10, 2021, when the sampling of the study began, the number of new cases of the virus was 18,408 individuals and the number of deaths was 351 people. This statistic was decreasing until the last day of sampling (June 26) with a gentle slope along with ups and downs, so that on June 26, 2021, the number of new cases of the COVID-19 virus reached 7,034 people and the number of deaths reached 123 individuals. In terms of vaccination, during the sampling period in this study, it should be said that until May 10, 2021, which coincided with the start of sampling in our study, 1,469,701 people had received the first dose of the COVID-19 vaccine, and only 290,347 people had received the second dose. Then, on the last day of sampling (June 26), this statistic reached 4,416,982 people for the first dose of the vaccine and only 1,196,157 for the second dose, which is not significant, compared to Iran's population of approximately 84 million people (3).

The study population in this study was all nursing students (regardless of their semester and level of education) of Ahvaz and Kermanshah Universities of Medical Sciences. Morgan's table was used to determine the sample size considering the maximum number of the population in this table, which is 384 individuals. In the present study, quota and convenience sampling method was used.

This means that at first, the contribution of Ahvaz and Kermanshah Universities of Medical Sciences to the total number of research samples was determined. To do this, the total number of nursing students in Ahvaz and Kermanshah Universities of Medical Sciences was obtained from the education officers and according to that, the contribution of each faculty was determined from the total number of samples. Since the total number of nursing students in Ahvaz and Kermanshah Universities of Medical Sciences was estimated to be about 800 and 500, respectively (according to the statements of the education officers of both faculties), Ahvaz University accounted for about two-thirds of the total sample size and Kermanshah University accounted for about one-third. Afterward, among the nursing students studying in each of the mentioned universities, sampling was done by the convenience method. Meaning that at first, by contacting the education officers of Ahvaz and Kermanshah Nursing and Midwifery Schools and explaining the aim of the research thoroughly, nursing students' representative contact numbers at different semesters and academic levels were obtained. After making the necessary arrangements with students' representatives and obtaining their consent, the link to the questionnaire was sent (designed through Google form) with a message from the researchers (including a clear and complete description of the study and its objectives, as well as questionnaire completion guide) to the student groups via social networks, and nursing students were requested to complete the questionnaire if they wish.

During the sampling process, reminder messages were placed in Telegram and WhatsApp groups on several occasions, so that the students who were willing to participate in the research but had not yet participated be able to complete the electronic questionnaire.

### 3.2. Online Questionnaire Part one: Demographic Characteristics and COVID-19 Related Variables

A two-part questionnaire was used to conduct the present study. The first part consisted of demographic characteristics and factors related to COVID-19. Demographic variables included age, gender, marital status, place of residence, economic status, number of family members, education level, year of study, university, residential (dorm) status, and history of mental illness. These questions were developed by reviewing the related literature and in

consultation with three faculty experts. COVID-19-related variables included: (1) history of persons, family members, relatives, or acquaintances with COVID-19 infection or being a suspected case of COVID-19, (2) stay in quarantine, (3) contact with a person who had or was suspected of having COVID-19 during the pandemic, (4) residence (dorm) attendance during the pandemic, (5) attendance in clinical departments during the pandemic, (6) level of satisfaction with health information about COVID-19, (7) level of trust in statistics about the incidence and mortality rate of COVID-19, (8) level of trust in existing treatments for COVID-19, (9) concern about oneself and family members being infected with COVID-19, (10) level of satisfaction with e-learning during the COVID-19 pandemic. These questions were developed based on previous studies and after consultation with three faculty experts.

### 3.3. Online Questionnaire Part Two: Symptom Checklist-25

Symptom Checklist-25 (SCL-25) was the second part of this questionnaire. It is a self-report instrument designed to measure general psychopathology. This questionnaire was developed using the statistical method of factor analysis of the SCL-90 questionnaire. This scale includes 25 items and 9 subscales. These 9 subscales include somatic complaints (6 items), obsessive-compulsive disorders (3 items), interpersonal sensitivity (3 items), depression (2 items), anxiety (3 items), phobia (3 items), paranoid thoughts (1 item), psychosis (3 items), and an additional wording (1 item). Each question is scored on a continuum from 1 (for none) to 5 (mostly). A score between 25 and 50 represents good mental health, between 50 and 75 represents a suspected mental disorder, and a score above 75 represents a severe mental disorder in the individual.

To obtain the score of each subscale, it is enough to add the scores of the related items together and divide by the number of items. Higher scores mean more suffering. Najarian and Davoudi (2010) in their study used the factor analysis method to verify the validity of this scale by using the analysis of a moment structures software, and the results of the tests showed that all the items of this questionnaire had a favorable factor load between 0.55 and 0.83 that is significant at the level of  $P < 0.01$  and indicates the good validity of this checklist. Furthermore, the divergent validity of the SCL-25 checklist in another study was determined by calculating its correlation with Ryff's scale of Psychological well-being (PWS) and Keyes' social well-being scale (SWS). The results showed a negative and significant correlation at the level of  $P < 0.05$  among the subscales of this checklist and the mentioned scales, which showed the appropriate divergent validity of SCL-25. In addition, the reliability of SCL-25 was calculated by Cronbach's alpha and split-half coefficient. These coefficients

were between 0.71 to 0.95 and 0.65 to 0.96, respectively, indicating relatively good reliability of the checklist (17, 18).

### 3.4. Statistical Analysis

The obtained data were analyzed using SPSS software (version 22). Frequency (percentage) and mean (standard deviation) were used for variable description. To compare the mental health mean scores of the participants based on their descriptive characteristics and COVID-19-related variables, independent sample t-test, Mann-Whitney U, and Kruskal-Wallis tests were performed. Dunn's pairwise comparison test was also used for Post hoc comparison. The linear regression analyses were conducted to evaluate factors associated with mental health. The regression model was determined using the stepwise method. The stepwise regression method in this study was actually a combination of two forward and backward methods.

In the forward method, initially, there was no variable in the model, and the first variable that entered the model was the variable that had the highest correlation with the dependent variable (mental health) of the research. If after running the regression model, the significance value and its statistics were acceptable, the variable remained in the model. Next, the second variable that had the highest correlation with the dependent variable was entered into the model, and the regression model was implemented. This process continued until the significant value of the variables in the model did not exceed the desired value. In the backward method, initially, all the variables were present in the model, and step by step the variable that was not at an acceptable level of significance was removed from the model. In this method, the implementation of the model continued until the last variable with the lowest statistic was removed from the model. A P-value of <0.05 was considered statistically significant.

## 4. Results

Table 1 shows the sociodemographic characteristics of the participants and COVID-19-related variables. The mean±SD age of the participants in the present study was 23.26±4.54 years. Most participants were female (56.1%, n=216), single (88.1%, n=339), studied at Ahvaz University of Medical Sciences (60.3%, n=232), lived in urban areas (85.2%, n=328), lived in dormitory (52.7%, n=203), and had good family income (51.9%, n=200). The educational level of most participants (90.1%, n=374) was a bachelor's degree. The mean±SD mental health score of the participants was 47.48±16.03. The distribution of the total mental health score was as follows: good mental health (61%, n=235), suspected mental disorder (32.2%, n=124), and severe mental disorder (6.8%, n=26).

Table 2 shows the nine dimensions of the SCL-25 mental health scale. As shown in the table, the most common mental health problems among the students were related to the dimensions of somatic complaints (with a mean score of 10.45) and obsessive-compulsive disorders (with a mean score of 6.60), respectively. The lowest percentage of students reported paranoid thoughts (with a mean of 1.72).

Mean difference tests were used to determine the relationship between student mental health and the independent research variables. The results of the independent t-test showed a significant gender difference in the mental health of nursing students. This means that female students had a higher mean score on the mental health variable than male students, and therefore, their mental health was in a worse state. The results of the Mann-Whitney U test also showed a statistically significant difference in the mental health of nursing students in relation to variables, such as a history of mental illness; a history of persons, family members, relatives, or acquaintances with COVID-19 infection, or being a suspected case of COVID-19; a history of contact with a person who has or is suspected of having COVID-19; and stay in quarantine.

On the other hand, the Kruskal-Wallis test provided strong evidence of a difference (P<0.001) between the mean ranks of at least one pair of groups regarding level of trust in the statistics provided on the incidence and mortality rate of COVID-19 scores (Table 3). Dunn's pairwise comparison test indicated a significant difference in the mean ranks of Very much and Very low (P=0.005), Very much and Low (P=0.023), Much and Very Low (P=0.001), as well as Much and Low (P=0.012). This indicated that the students whose level of trust in the statistics provided on the incidence and mortality rate of COVID-19 were at very high and high levels had significantly better mental health than students with a very low and low levels of trust.

The results of the Kruskal-Wallis test also showed a significant difference (P<0.001) between the mean ranks of at least one pair of groups for the level of trust in the existing treatment methods for treating COVID-19 scores (Table 3). Thus, Dunn's pairwise test was carried out for the pair groups. The results indicated a significant difference in the mean ranks of Much and Very low (P=0.003). According to the findings, the students whose level of trust in the existing treatment methods for treating COVID-19 were at a Much level had significantly better mental health than students with a Very low level of trust. Furthermore, the results of Kruskal-Wallis test revealed a significant difference (P<0.001) between the mean ranks of at least one pair of groups regarding the level of satisfaction with e-learning scores (Table 3). The results of Dunn's pairwise test indicated a significant difference in the mean ranks of Very much and Very low (P=0.009). This means that

**Table 1.** Socio-demographic characteristics of the participants and COVID-19-related variables

Variable		Mean±SD or n (%)
<b>Age</b>		23.26±4.54
<b>Gender</b>	Female	216 (56.1)
	Male	169 (43.9)
<b>Marital status</b>	Single	339 (88.1)
	Married	46 (11.9)
<b>University</b>	Ahwaz	232 (60.3)
	Kermanshah	153 (39.7)
<b>Place of residence</b>	Urban	328 (85.2)
	Rural	57 (14.8)
<b>Dormitory status</b>	Dormitory	203 (52.7)
	Non-dormitory	182 (47.3)
<b>Education level</b>	BSc	374 (90.1)
	MSc	25 (6.5)
	PhD	12 (3.4)
<b>Year of study</b>	Freshman	61 (15.8)
	Sophomore	143 (37.1)
	Junior	92 (23.9)
	Senior	89 (23.1)
<b>Economic status</b>	Good	200 (51.9)
	Moderate	157 (40.8)
	Poor	28 (7.3)
<b>History of mental illness</b>	Yes	17 (4.4)
	No	367 (95.3)
<b>History of coronavirus infection or suspected of coronavirus infection</b>	Yes	158 (41)
	No	227 (59)
<b>History of coronavirus infection or suspected of coronavirus infection in the family</b>	Yes	163 (42.3)
	No	222 (57.7)
<b>Stay in quarantine</b>	Yes	92 (23.9)
	No	293 (76.1)
<b>Residence (dorm) attendance during the pandemic</b>	Yes	184 (47.8)
	No	201 (52.2)
<b>Attendance in clinical departments during the pandemic</b>	Yes	326 (84.7)
	No	59 (15.3)
<b>Level of satisfaction with health information about COVID-19</b>	Very much	25 (6.2)
	Much	96 (24.9)
	Acceptable	218 (56.6)
	Low	34 (8.8)
	Very low	12 (3.1)
<b>Level of trust in statistics about the incidence and mortality rate of COVID-19</b>	Very much	13 (3.4)
	Much	32 (8.3)
	Acceptable	118 (30.6)
	Low	125 (32.5)
	Very low	97 (25.2)
<b>Concern about oneself and family members being infected with COVID-19</b>	Very much	104 (27)
	Much	131 (34)
	To some extend	126 (32.7)
	Low	20 (5.2)
	Not at all	4 (1)
<b>Level of satisfaction with e-learning</b>	Very much	13 (3.4)
	Much	25 (6.5)
	Acceptable	115 (29.9)
	Low	126 (32.7)
	Very low	106 (27.5)

COVID-19: Coronavirus Disease 2019; SD: Standard deviation.

students who were very satisfied with e-learning had better mental health than students whose satisfaction was at a Very low level.

The stepwise regression analysis showed that among the variables available, four variables, including gender, history of mental illness, history of coronavirus infection or being suspected of having coronavirus, and level of trust in statistics on the incidence and mortality rates of COVID-19 were significantly associated with mental health. In other words, as Table 4 shows, being a female nursing

student predicted poorer mental health ( $\beta=-0.199$ ,  $P<0.001$ ). Nursing students with a history of mental illness were more likely to have lower mental health ( $\beta=-0.151$ ,  $P<0.001$ ). Students with a history of coronavirus infection or being suspected of having coronavirus were predicted to have poorer mental health ( $\beta=-0.201$ ,  $P<0.001$ ). In addition, the less trust the person had in statistics on the incidence and mortality rates of COVID-19, the more likely they were to have poorer mental health ( $\beta=0.175$ ,  $P<0.001$ ). As can be seen in Table 4, these four



**Table 2.** SCL-25 mental health dimensions

Mental health dimension	Mean±SD	Minimum	Maximum
Somatic complaints	10.45±4.19	6	30
Obsessive-compulsive disorders	6.60±3.04	3	15
Interpersonal sensitivity	6.42±2.87	3	15
Depression	3.96±1.91	2	10
Anxiety	6.03±2.67	3	15
Phobia	5.76±2.59	3	15
Paranoid thoughts	1.72±10.02	1	5
Psychosis	4.71±1.86	3	15

SD: Standard deviation

**Table 3.** Comparison of students' mental health scores in terms of different variables

Variable		Mean±SD	Test result
Gender	Female	49.94±16.87	P<0.001 <sup>a</sup>
	Male	44.33±14.32	
History of mental illness	Yes	62.17±15.63	P<0.001 <sup>b</sup>
	No	46.80±15.74	
History of COVID-19 infection	Yes	51.77±16.64	P<0.001 <sup>b</sup>
	No	44.49±14.92	
History of family members infected with COVID-19	Yes	49.74±15.72	P<0.001 <sup>b</sup>
	No	45.82±16.09	
History of relatives or acquaintances infected with COVID-19	Yes	48.81±16.00	P<0.001 <sup>b</sup>
	No	42.15±15.09	
History of contact with a person who has or is suspected of having COVID-19	Yes	49.94±15.59	P<0.001 <sup>b</sup>
	No	44.90±16.12	
Stay in quarantine	Yes	53.53±16.83	P<0.001 <sup>b</sup>
	No	45.58±15.31	
Level of trust in the statistics provided on the incidence and mortality rate of COVID-19	Very much	36.77±13.72	P<0.001 <sup>c</sup>
	Much	40.28±15.54	
	Somewhat	45.84±15.97	
	Low	49.33±16.27	
Level of trust in the existing treatment methods for treating COVID-19	Very low	50.93±14.90	P<0.001 <sup>c</sup>
	Very much	42.12±14.19	
	Much	42.38±15.1	
	Somewhat	47.82±16.82	
Level of satisfaction with e-learning	Low	47.19±13.20	P<0.001 <sup>c</sup>
	Very low	55.85±18.40	
	Very much	40.92±12.65	
	Much	51.42±16.07	
Level of satisfaction with e-learning	Somewhat	45.90±16.17	P<0.001 <sup>c</sup>
	Low	47.51±14.48	
	Very low	50.60±17.51	

The independent t-test

<sup>b</sup>The Mann-Whitney U test<sup>c</sup>The Kruskal-Wallis test**Table 4.** Association between mental health and demographic/ COVID-19-related variables among nursing students

Variable	Unstandardized Coefficients β	Standardized Coefficients β	std. Error	t	P	R	R <sup>2</sup>	Adjusted R <sup>2</sup>
(Constant)	80.220		8.840	9.075	<0.001			0.139
Gender	-6.417	-0.199	1.534	-4.183	<0.001			
History of mental illness	-11.734	-0.151	3.755	-3.125	.002			
History of coronavirus infection or suspected of coronavirus infection	-6.555	-0.201	1.565	-4.187	<0.001	0.384	0.148	
Level of trust in statistics about the incidence and mortality rate of COVID-19	2.683	0.175	.741	3.620	<0.001			

Std. Error: Standard error; COVID-19: Coronavirus Disease 2019

variables explained 13.9% of the total variance observed in the mental health scores.

## 5. Discussion

The main purpose of this study was to determine the mental health status of nursing students and

associated factors during the COVID -19 pandemic. The results showed that at the time of the study, 32.2% of nursing students were suspected of having mental disorders and 6.8% of them had severe mental health problems, which is a relatively high percentage. Although we could not find any study that examined the mental health of nursing students

during the pandemic with the same questionnaire (SCL-25) that we used in our study, the results of many similar studies conducted in this area also suggest that the pandemic seriously affected the mental health of these students (11-13, 15). In general, it seems that the special conditions of the COVID-19 pandemic, such as quarantine and social distancing, the unpredictability of the development of the pandemic, worry about getting infected or transferring the infection to family members with COVID-19, and the problems related to e-learning are associated with negative consequences for students' mental health (19).

In the present study, the dimensions of somatic complaints and obsessive-compulsive disorders were identified as the most common mental health problems among nursing students during the COVID-19 pandemic. In our opinion, the prevalence of somatic complaints and obsessive-compulsive disorders among the students could be due to the fact that they experience higher levels of stress and anxiety because of the sudden changes that the onset of the disease brings to life and frequent hand washing to avoid infection, respectively. In addition, the stepwise regression method revealed that among the available variables, four variables, including gender, history of mental illness, history of getting coronavirus infection or being suspected of having coronavirus, and level of trust in statistics on the incidence and mortality rates of COVID-19 had the greatest impact on mental health modeling. Each of these variables is discussed below.

The results of the present study show that female nursing students had poorer mental health than male students during the COVID-19 pandemic. The results of our study are consistent with a large number of studies in this area (11, 15, 20). Indeed, female students appear to be more emotionally sensitive and fragile, which may make them more vulnerable during the COVID-19 pandemic. Moreover, the results of a number of studies show that women are less able to cope with stressful situations than men. Physiologically, women are subject to greater fluctuations in their female hormone levels, and distress may lead to stronger reactions in them (21, 22). On the other hand, the results of another study suggest no significant gender difference in the level of anxiety and mental health of nursing students during the COVID-19 pandemic (23). However, in contrast to the results of our study, a study from China reported higher rates of post-traumatic stress disorder, stress, depression, and anxiety in male nursing students (24). The possible reason for this discrepancy may be related to different cultures, traditional beliefs, and professional conditions in China, which resulted in male nursing students being exposed to higher psychological pressure.

The present study also showed that during the COVID-19 pandemic, students with a history of

mental illness generally had more severe mental disorders. Consistent with our study, the results of a study in Turkey also suggest that the COVID-19 pandemic had a greater impact on people with a history of mental illness (25). Because people with mental disorders are generally more vulnerable, external stressors, such as quarantine and social isolation caused by the pandemic, may affect these people more. In addition, care for individuals with psychiatric and mental health conditions declined sharply during the COVID-19 pandemic because their health needs were not a priority at that time. Therefore, this condition may be the other cause of more psychological distress in people with mental disorders during the pandemic.

Another finding of our study was that the students with a history of COVID-19 infection generally had lower levels of mental health than students without such a history. Similarly, the results of a study in China showed higher levels of depression, anxiety, and post-traumatic stress disorder in patients with COVID-19, compared to the control group without COVID-19 (26). Indeed, the high level of anxiety, depression, and post-traumatic stress disorder in patients with coronavirus infection is not surprising given the seriousness of COVID-19. As with other similar illnesses, patients have experienced severe psychological consequences, such as at the height of the SARS outbreak (27).

Another finding of the present study was that the more students trust the statistics on the incidence and mortality rate of COVID-19, the better their mental health. Our study is consistent with the findings of a study by Bastani et al. in 2020 (28). Regardless of the type of media from which people obtain the information they need, such as viral morbidity and mortality rates, reliable information is very important to properly deal with the devastating effects that crises can have on human health. This means that the spread of rumors and fake news can cause anxiety, stress, fear, and depressive symptoms in people (28). Nevertheless, Patwary et al. (2021) came to interesting conclusions in their study in Bangladesh.

The results of their study showed that greater reliance on traditional media, such as radio, television, and newspapers, was associated with higher levels of stress and anxiety during the COVID-19 pandemic (29). One possible reason for this discrepancy between our study and Patwary's could be related to the difference in the time when the study was conducted. The study by Patwary was conducted in the early months of the pandemic. Therefore, the frequent dissemination of news and updated information about COVID-19 may have led to increased anxiety in the population because the disease was less known at that time. Based on our findings and the results of the studies discussed, it is generally necessary for the mass media to constantly

respond to people's need for accurate information in critical situations, such as the COVID-19 pandemic so that people in society do not suffer additional stress and anxiety.

In the present study, we had to accept several limitations. First, the data were collected electronically using a web-based questionnaire. Therefore, it was not possible to meet the students in person to clarify their ambiguities regarding the items in the questionnaire. Another limitation of our study is that we did not conduct interviews with the students and only used a questionnaire to assess their mental health.

## 6. Conclusion

In conclusion, the specific conditions resulting from the COVID-19 pandemic may have negative effects on the mental health of nursing students. Therefore, it is very important to identify and consider the factors that can reduce the mental distress of these students. Officials are also expected to take effective measures to improve the mental health of nursing students in critical situations, as they play a key role in providing health care to the members of the community. To this end, regular assessment of students' mental health is particularly important because it enables those working in education to provide the necessary psychological interventions at the right time.

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## Footnotes

**Conflicts of Interest:** The authors declare no conflicts of interest.

**Authors' contributions:** NC conceived the research idea, reviewed the literature, gathered and analyzed data, and drafted the manuscript; SB contributed to data gathering, data analyzing, and manuscript drafting; SB contributed to data analyzing and manuscript drafting; DR supervised the project and contributed to data gathering and analyzing.

**Ethical Approval:** This study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences (ethics code: IR.AJUMS.REC.1399.881). Participants were assured that their information and responses would be kept confidential at all stages of the research process. Participation in this study was also voluntary for all participants, and they were fully informed of the purpose of the study.

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