Nursing and midwifery students' knowledge and concerns about COVID-19: a descriptive-analytical study

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Article Info

ABSTRACT

The coronavirus disease 2019 (COVID-19) pandemic has changed educational trends for all university students, including nursing and midwifery students (NMSs). In the future, these students will play critical roles in healthcare delivery systems. The purpose of the study was to examine knowledge, fear, and anxiety about COVID-19 among NMSs. A cross-sectional descriptive-analytical study involved 600 NMSs were performed through an online survey from February to March 2021 in Iran University of Medical Sciences. Data gathering was done using a demographic questionnaire, the COVID-related Knowledge Questionnaire, The Fear of COVID-19 Scale, and the Corona Disease Anxiety Scale. Instruments were provided to students through WhatsApp, Telegram, or email. The study instruments were completely answered by 415 students. Their age was 24.63±4.97 years, on average. Most participants were female (62.2%) and single (76.9%). The mean scores of their knowledge, fear, and anxiety about COVID-19 were respectively 13.41±1.32 (in the possible range of 0–15), 21.93±6.78 (in the possible range of 7–35), and 19.82±12.77 (in the possible range of 0–54). NMSs have great knowledge, relatively great fear, and mild anxiety about COVID-19. Flexible educational programs, close monitoring of fear and anxiety, and effective need-based education are necessary for NMSs, particularly during pandemics.

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1. INTRODUCTION

The COVID-19 is a contagious disease [1] that spread rapidly throughout the world [2], [3]. COVID-19 management and control are now major global healthcare challenges [1]. So far, COVID-19 has caused more than four million deaths worldwide and more than 123,000 deaths in Iran [3]. Currently, the best strategy for COVID-19 control is prevention at the community level through frequent handwashing, social distancing, avoiding crowded places, and quarantine.

Healthcare authorities in many countries, including Iran, employed strategies such as social distancing and suspension of some businesses and activities in order to slow the spread of the disease [4], [5]. Universities also suspended most of their in-person activities and resorted to remote activities using online communications [6], which many felt had a negative impact on educational progress [7].

Compared with other university students, medical sciences students, including nursing and midwifery students (NMSs), usually experience higher levels of fear and anxiety due to the emotional challenges of working with human life [8], [9]. During their formal university education, NMSs need to attend courses in clinical settings [10]. Such attendance puts them at risk for COVID-19. Fear about contracting COVID-19 has imposed added psychological strain on NMSs [11] and caused them psychological problems such as anxiety [12]. Anxiety, in turn, negatively affects their learning, decision making ability [13], and psychological wellbeing [14]. Studies [15], [16] reported excessive fear and anxiety due to COVID-19 among medical sciences students.

Knowledge about diseases is a significant factor affecting the level of fear and anxiety among medical sciences students [17]. COVID-19 causes considerable occupational health risks to medical students given the extensive contact with infected individuals [18]. Sonam *et al.* [19] shows that poor knowledge in medical students results in diagnosis with delay, wide spread of disease and inefficient disease control methods. As a result, assessing the knowledge of NMSs against such outbreaks is essential, especially given the large amount of updated information on disease transmission and acquisition methods [20]. In-depth knowledge about COVID-19 among these students can significantly reduce their fear and anxiety [9]. It was shown in [21], [22] that a high prevalence of some psychological problems such as fear, depression, anxiety, and stress in previous epidemics. Wang *et al.* [23] reported that university students experienced moderate to severe anxiety due to COVID-19. Two other studies [16], [22] showed that despite having adequate knowledge about COVID-19, students had high levels of fear and anxiety. A great deal of decline in NMSs's quality of life can happen by fear and anxiety. These have a negative impact on quality of life in terms of health and self-reported functional limitations [24]. Taking into account the fast spread of the disease and inadequate studies on it, it is essential to assess fear and anxiety it causes as a way to improve individuals' quality of life [14], [24].

Data derived from prior epidemics shows that knowledge, fear, and anxiety play significant roles in the management of epidemics [25]. NMSs are people with close contact with patients. Without knowledge about this population, there can be an increase in the level of fear and anxiety so that their clinical decision making process might be interrupted [26]. There is a need to perform a basic study on NMS's knowledge and their fear and anxiety due to COVID-19 as the diseases is spreading fast in hospitals around the world. Our searcher found limited studies of NMSs' knowledge, fear, and anxiety about COVID-19. The present study was carried out to narrow this gap, examined knowledge, anxiety, and fear about COVID-19 in NMSs, and help better define relevant educational changes that might ameliorate these adverse mental health effects. The findings can give use an overview of NMSs' knowledge, fear and anxiety about COVID-19; based on which a proper strategy can be adopted for the students.

2.   RESEARCH METHOD

A cross-sectional descriptive-analytical study was conducted in February and March 2021. After the approval of the ethics committee, online questionnaire was sent to the participants. Participants were provided with the ethical approval code of the study, the first author's name and telephone number, and written information about the study aim, study importance, voluntary nature of participation, and confidentiality of the study data. The invitation message also informed participants that their complete response to the instruments would be considered as their consent to participation.

Study participants were all 600 bachelor's, master's, and PhD students at the Faculty of Nursing and Midwifery of Iran University of Medical Sciences, Tehran, Iran. An online questionnaire was sent to all of these students, and sampling continued until two-thirds of them volunteered to answer the questionnaire. Based on previous studies, considering p=q=0.05 and d=0.05 [27], the sample size was selected according to the formula (1) equal to 400 people for the total questionnaire [28].

$$N = \frac{(Z_{1-\frac{\alpha}{2}})^2 p(1-p)}{d^2} = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} \simeq 400 \tag{1}$$

p=q=0.5
d=0.05
N=400

The study setting was the Faculty of Nursing and Midwifery of Iran University of Medical Sciences, Tehran, Iran. At the time of the study, students in the study setting performed most their educational activities through online communications and passed their clinical courses in hospital wards with no COVID-19 patients. Some students worked in different hospital wards as either volunteers or paid healthcare providers.

Sampling was performed online. All NMSs in the study setting were invited to the study using WhatsApp, Telegram, or email. Our inclusion criteria for the participant were using social networks (Telegram, WhatsApp and Email) and during the study, they are studying at the Faculty of Nursing and Midwifery of Iran University of Medical Sciences. Sampling was continued until two-thirds of the students in the study setting completed the study instruments.

Data collection instruments were a demographic questionnaire, the COVID-related Knowledge Questionnaire, The Fear of COVID-19 Scale, and the Corona Disease Anxiety Scale. The demographic questionnaire captured information about participants' age, gender, marital status, academic degree, academic year, field of study, place of residence, history of working in COVID-19 wards, participation in educational programs on COVID-19, and history of cigarette smoking.

The COVID-related knowledge questionnaire has 15 items about basic knowledge of COVID-19, including its causes, symptoms, diagnosis, incubation period, public prevention, transmission routes, medical professionals' specific prevention, and referring suspected cases. As to scoring, the correct answers were equal to 1, incorrect and "I don't know" answers are equal to 0. The scoring range for the questionnaire was 0–15, with higher scores showing greater knowledge as to COVID-19 [29]. Given the tool guide, knowledge scores were changed into a percentile and interpreted as follows: 75 and more: excellent knowledge; 50–75: moderate knowledge; and 50 and less: poor knowledge. Taghriri *et al.* developed this questionnaire in Persian and reported a Cronbach's alpha of 0.80 for it [29]. According to the recommendations of its developers, this questionnaire should be updated based on new knowledge about COVID-19. Consequently, the item "All people should wear a mask," which had been considered as an incorrect statement in the original questionnaire, was considered as a correct statement according to the most recent COVID-19 management protocols. The Kuder-Richardson 21 coefficient of the questionnaire in the present study was 0.6. Permission to use the questionnaire was obtained from its developers through email.

The Fear of COVID-19 Scale was used to measure participants' fear of COVID-19. This scale is designed by Ahorsu *et al.* in Iran and contains seven items scaled on a five-point scale including 1="Completely disagree"; 2="Disagree"; 3="Neither agree nor disagree"; 4="Agree"; and 5="Completely agree". The possible total score of the scale is 7–35, with higher scores representing greater fear. Ahorsu *et al.* confirmed the acceptable reliability and validity of the scale and reported a Cronbach's alpha of 0.82 [30]. Here, the Cronbach's alpha of the scale was 0.907. Permission to use this scale was obtained from its developers through email. The Corona Disease Anxiety Scale is introduced in Persian by Alipour [24]. The scale contains 18 items in two nine-item dimensions: psychological symptoms (items 1–9) and physical symptoms (items 10–18). The scoring of the items is based on a four-point scale (0="Never"; 1="Sometimes"; 2="Often"; and 3="Always". The possible total score of the scale is 0–54, with higher scores showing greater anxiety. This scale has acceptable internal consistency and convergent validity with a Cronbach's alpha of 0.91 [24]. The Cronbach's alpha of the scale here was equal to 0.956. Permission to use the scale was obtained from its developers through email.

For face validity assessment in the present study, 10 master and Ph.D NMSs, an infectious disease specialist, a psychologist, and eight nursing instructors read and commented on the simplicity, readability, wording, and grammar, of the items. Items were revised according to their comments. The content validity of the instruments was assessed by the same 10 specialists. They rated the simplicity and the clarity of the items using a four-point scale and their ratings were used to determine content validity index. The items had a content validity index greater than 0.7 and were considered acceptable [31].

At our request, the staff of the Public Relations Department of the study setting added all students in the study setting to a WhatsApp or Telegram group. An invitation message containing a link to the study instruments was sent to each student. Participants with no access to WhatsApp or Telegram were invited to the study and provided with the link to the study instruments through email. The link was available to each participant for two weeks. Items were forced-choice. Answering the study questions took only 3-5 minutes. Data analysis was done using SPSS (V.16.0) and normal distribution was checked using KS test. As to descriptive statistics, SD, mean, absolute frequency, and relative frequency were utilized for describing the data. The relationships of the mean scores of knowledge, fear, and anxiety with participants' demographic characteristics were tested using the independent-sample t test, the one-way ANOVA, and the Pearson's correlation analysis (0.05).

3. RESULTS AND DISCUSSION

There were 600 students invited to the study; however only 415 students completely answered the questionnaire (response rate: 69%). The mean of participants' age was 24.63±4.97 years. Most participants were female (62.2%), single (76.9%), and bachelor's student (75.7%), studied nursing (81.2%), had no history of working in COVID-19 wards (60.7%), had not participated in educational programs on COVID-19

(81.7%), and reported no history of cigarette smoking (94.7%), and 48.2% of them lived in a university dormitory. Table 1 shows their characteristics.

The mean score of knowledge of COVID-19 was equal to 13.41±1.32 in the 0–15 possible range. Their knowledge about COVID-19 was excellent in 91.1% of cases, moderate in 8.4% of cases, and poor in 0.5% of cases. The highest scored item of the knowledge questionnaire was item 9, "COVID-19 is preventable through handwashing, mask wearing, and personal hygiene." Overall, 98.1% of participants provided a correct answer to this item. The lowest scored item was item 15, which asked about the necessity of seeking medical help if COVID-19 symptoms appear in 14 days after direct exposure to a suspected case of COVID-19. Only 55.7% of participants correctly answered this item as shown in Table 2.

Participants' knowledge about COVID-19 was significantly related to their academic degree (p=0.008). Post hoc analysis revealed that the mean score of PhD students higher than bachelor's students significantly (p=0.047). Knowledge had a significant relationship with a participant's academic standing (p=0.045); third-year students in all academic degrees had significantly higher knowledge scores than first-year students (p=0.024). Participants with a history of working in COVID-19 wards and those with no history of cigarette smoking obtained significantly higher knowledge scores compared with other students (p<0.05). according to the correlation analysis, there was a significant positive correlation between participants' age and the mean score of their knowledge about COVID-19 (p<0.001) as shown in Table 1. Fears of COVID-19—The mean score of participants' fears of COVID-19 was 21.93±6.78 in the 7–35 possible range. The highest and the lowest mean scores were 3.61 and 2.61 which were related to item 2 ("It makes me uncomfortable to think about COVID-19") and item 6 ("I cannot sleep because I worry about getting COVID-19") as shown in Table 3.

Fear about COVID-19 had a significant relationship with participants' academic degree (p=0.025); PhD students had significantly greater fear than master's students (p=0.019). Participants' field of study also had a significant relationship with their fears about COVID-19. Midwifery students had significantly greater fear than their nursing counterparts (p=0.02). The mean score for fear about COVID-19 among participants with no history of participation in educational programs on COVID-19 and those with no history of cigarette smoking was significantly greater than for other students (p=0.002) as shown in Table 1.

The mean score of participants' anxiety of COVID-19 was 19.82±12.77 in the possible range of 0–54. The highest and the lowest item mean scores were 2.25 for item 7 ("I am concerned about transmitting the virus to others around me") and 0.25 for item 14 ("I get goose bumps when I think about COVID-19") that can be seen in Table 4. The mean scores of the psychological and the physical symptoms dimensions of anxiety about COVID-19 were 13.91±7.32 and 5.90±6.19, respectively.

Anxiety about COVID-19 among midwifery students had significantly greater anxiety than nursing students (p=0.026). Participants who lived in a university dormitory had significantly greater anxiety than those who lived with their families (p=0.003). Participants with no history of participation in educational programs on COVID-19 and those with no history of cigarette smoking also reported significantly greater anxiety than other participants (p<0.05) Table 1.

This study assessed knowledge, fear, and anxiety about COVID-19 among NMSs. In our study, knowledge about COVID-19 was excellent. A prior study [29] in the first weeks of the COVID-19 pandemic reported a high level of COVID-19 knowledge among medical sciences students in Iran. The mean score of knowledge here was slightly higher than in the prior study, which implies improvement in students' knowledge about COVID-19. In beginning of the COVID-19 pandemic, COVID-19 management protocols did not consider mask wearing by all people necessary, so the item "All people should wear a mask" in the COVID-related Knowledge Questionnaire a yes answer to this question was considered incorrect. However, later protocols stated that all people should wear a mask and a "yes" answer was considered correct in the present study. Findings showed that more than 96% of participants correctly answered this item, reflecting their up-to-date knowledge about COVID-19 [32].

The highest scored knowledge item here was related to the item, "COVID-19 is preventable through handwashing, mask wearing, and personal hygiene." Close adherence to COVID-19 prevention behaviors such as handwashing, mask wearing, and social distancing is effective in preventing COVID-19 transmission [33]. These results demonstrate the impact of efforts by health and education authorities to sensitize students to COVID-19.

The lowest knowledge item score in this study was related to the item on the necessity of seeking medical help if COVID-19 symptoms develop in 14 days after direct exposure to cases of COVID-19. A prior study in Iran reported the same finding, indicating a lack of knowledge in this area. Seeking timely medical help and early diagnosis and treatment of COVID-19 are very important for both the infected person and others. Delays in seeking help while can lead to serious complications and the unnecessary spread of infection [34], so there is an urgent need for awareness-raising activities. Since medical sciences students

have a significant role in promoting public health, it is important that they be provided accurate education about the need to seek prompt medical attention for COVID-19 symptoms.

Table 1. The participants' demographic characteristics with the mean scores of their knowledge, anxiety, and fear about COVID-19

Characteristics		N (%)	Knowledge		Anxiety		Fear	
			Mean±SD	Test result	Mean±SD	Test result	Mean±SD	Test result
Gender	Female	258 (62.2)	89.43±8.48	t=0.042	20.92±12.75	t=2.265	22.96±6.54	t=4.034
	Male	157 (37.8)	89.46±9.31	P=0.966	18.01±12.62	P=0.024	20.24±6.84	P<0.001
Marital status	Single	319 (76.9)	89.07±8.69	t=1.589	19.61±12.71	t=0.618	21.68±6.88	t=1.388
	Married	96 (23.1)	90.69±9.04	P=0.113	20.53±12.98	P=0.537	22.78±6.38	P=0.166
Academic degree	Bachelor's	314 (75.7)	88.7±8.85	F=4.898	19.76±12.25	F=2.117	21.97±6.82	F=3.704
	Master's	71 (17.1)	91.36±8.53	P=0.008	18.31±13.02	P=0.122	20.64±5.94	P=0.025
	PhD	30 (7.2)	92.66±7.49		24±16.54		24.63±7.53	
Field of study	Nursing	337 (81.2)	89.31±8.79	t=0.617	19.15±12.66	t=2.231	21.44±6.77	t=3.101
	Midwifery	78 (18.8)	90±8.84	P=0.538	22.71±12.88	P=0.026	24.06±6.43	P=0.002
Place of residence	With parents	157 (37.8)	88.53±8.82	F=1.672	17.31±12.13	F=5.628	21.24±6.74	F=1.664
	Dormitory	200 (48.2)	89/76±8.42	P=0.189	21.83±12.9	P=0.004	22.55±6.8	P=0.191
	Private house	58 (14)	90.8±9.81		19.67±12.99		21.71±6.74	
Academic year	First	56 (13.5)	86.9±9.76	F=2.7	18.08±12.52	F=0.955	20.53±6.94	F=2.04
	Second	142 (34.2)	89.34±8.66	P=0.045	20.1±12.81	P=0.414	22.32±6.64	P=0.108
	Third	95 (22.9)	91.08±7.69		21.35±13.21		22.97±6.67	
	Fourth	122 (29.4)	89.45±9.1		19.09±12.48		21.32±6.87	
Working in COVID-19 wards	No	252 (60.7)	88.46±8.84	t=2.846	19.19±12.56	t=1.258	22.01±6.83	t=0.254
	Yes	163 (39.3)	90.96±8.53	P=0.005	20.8±13.05	P=0.209	21.83±6.73	P=0.799
Participation in educational programs on COVID-19	No	339 (81.7)	98.41±8.61	t=0.127	20.72±12.66	t=3.078	22.37±6.72	t=2.78
	Yes	76 (18.3)	89.56±9.63	P=0.899	15.78±12.55	P=0.002	20±6.73	P=0.006
History of cigarette smoking	No	393 (94.7)	89.66±8.76	t=2.197	20.14±12.81	t=2.191	22.18±6.71	t=3.122
	Yes	22 (5.3)	85.45±8.64	P=0.029	14.04±10.59	P=0.029	17.59±6.66	P=0.002
Age (years)	Mean±SD (Range)	24.63±4.97 (19–49)	—	r=0.169 p=0.001	—	r=-0.078 P=0.112	—	r=-0.089 P=0.071

Table 2. The mean score of participants' knowledge about COVID-19 and the frequency distribution of their responses to knowledge items

No.	Items	Correct answer N (%)	Wrong answer N (%)	I don't know N (%)
1	COVID-19 is a respiratory infection caused by a new species of coronavirus family.	396 (95.4)	15 (3.6)	4 (1)
2	The first case of COVID-19 was diagnosed in Wuhan, China.	401 (96.6)	4 (1)	10 (2.4)
3	The origin of COVID-19 is not clear but it seems that it has been transmitted to human by sea foods, snakes or bats.	391 (94.2)	19 (4.6)	5 (1.2)
4	Its common symptoms are fever, cough and shortness of breath but nausea and diarrhea were reported rarely.	389 (93.7)	13 (3.1)	13 (3.1)
5	Its incubation period is up to 14 days with a mean of five days.	364 (87.7)	20 (4.8)	31 (7.5)
6	It can be diagnosed by polymerase chain reaction (PCR) test on samples collected from nasopharyngeal and oropharyngeal discharge or from sputum and bronchial washing.	397 (95.7)	6 (1.4)	12 (2.9)
7	It is transmitted through respiratory droplets such as cough and sneeze.	395 (95.2)	9 (2.2)	11 (2.7)
8	It is transmitted through close contacts with an infected case (especially in family, crowded places and health centers).	387 (93.3)	18 (4.3)	10 (2.4)
9	The disease can be prevented through handwashing and personal hygiene.	407 (98.1)	7 (1.7)	1 (0.2)
10	A medical mask is useful to prevent the spread of respiratory droplets during coughing.	399 (96.1)	12 (2.9)	4 (1)
11	The disease can be prevented through no close contacts such as handshakes or kissing, not attending meetings and frequent hand disinfection.	404 (97.3)	8 (1.9)	3 (0.7)
12	All people in society should wear masks.	378 (96.1)	13 (3.1)	24 (5.8)
13	Only during intubation, suction, bronchoscopy and cardiopulmonary resuscitation, you have to wear N95 mask.	295 (71.1)	72 (17.3)	48 (11.6)
14	The disease can be treated by usual antiviral drugs.	334 (80.5)	31 (7.5)	50 (12)
15	If symptoms appear within 14 days from direct contact with a suspected case, the person should inquire at a nearby public health center.	231 (55.7)	138 (33.3)	46 (11.1)
	Total, Mean±SD (Range)	13.41±1.32 (7–15)		

Table 3. The mean score of participants' fear about COVID-19 and the frequency distribution of their responses to fear items

No.	Fear	Completely disagree N (%)	Disagree N (%)	Neither agree nor disagree N (%)	Agree N (%)	Completely agree N (%)	Mean±SD
1	I am most afraid of COVID-19.	15 (3.6)	64 (15.4)	85 (20.5)	176 (42.4)	75 (18.15)	3.55±1.06
2	It makes me uncomfortable to think about COVID-19.	19 (4.6)	60 (14.5)	53 (12.8)	213 (51.3)	70 (16.9)	3.61±1.06
3	My hands become clammy when I think about COVID-19.	80 (19.3)	149 (35.9)	41 (9.9)	119 (28.7)	26 (6.3)	2.66±1.24
4	I am afraid of losing my life because of COVID-19.	31 (7.5)	74 (17.8)	57 (13.7)	185 (44.6)	68 (16.4)	3.44±1.17
5	When watching news and stories about COVID-19 on social media, I become nervous or anxious.	30 (9.4)	97 (23.4)	57 (13.7)	181 (43.6)	41 (9.9)	3.21±1.18
6	I cannot sleep because I'm worrying about getting COVID-19.	102 (24.6)	137 (33)	28 (6.7)	116 (28)	32 (7.7)	2.61±1.32
7	My heart races or palpitates when I think about getting COVID-19.	88 (21.2)	116 (28)	35 (8.4)	131 (31.6)	45 (10.8)	2.82±1.36
	Total, Mean±SD (Range)			21.93±6.78 (7–35)			

Table 4. The mean score of participants' anxiety about COVID-19 and the frequency distribution of their responses to anxiety items

No.	Anxiety	Never N (%)	Sometimes N (%)	Often N (%)	Always N (%)	Mean±SD
1	Thinking about coronavirus makes me anxious.	71 (17.1)	145 (34.9)	171 (41.2)	28 (6.7)	1.37±0.84
2	I feel tense when I think about the coronavirus threat.	100 (24.15)	123 (29.6)	140 (33.7)	52 (12.5)	1.34±0.98
3	I am seriously worried about the prevalence of coronavirus.	44 (10.6)	122 (29.4)	154 (37.1)	95 (22.9)	1.72±0.93
4	I am afraid of contracting coronavirus.	61 (14.7)	153 (36.9)	106 (25.5)	95 (22.9)	1.56±0.99
5	I fear that I might contract coronavirus anytime.	93 (22.4)	117 (28.2)	109 (26.3)	96 (23.1)	1.5±1.07
6	Minor symptoms make me think that I am contracting the virus, and I start checking myself.	75 (18.1)	127 (30.6)	105 (25.3)	108 (26)	1.59±1.06
7	I am concerned about transferring the virus to others around me.	20 (4.8)	61 (14.7)	128 (30.8)	206 (49.6)	2.25±0.87
8	My anxiety about coronavirus has interfered with my daily activities.	136 (32.8)	78 (18.8)	152 (36.6)	49 (11.8)	1.27±1.04
9	The mass medias focus on coronavirus make me anxious.	111 (26.7)	115 (27.7)	150 (36.1)	39 (9.4)	1.28±0.96
10	Thinking about coronavirus has interrupted my sleep.	212 (51.1)	68 (16.4)	105 (25.3)	30 (7.2)	0.88±1.02
11	I have lost my appetite because of thinking about coronavirus.	256 (61.7)	67 (16.1)	76 (18.3)	16 (3.9)	0.64±0.91
12	I get a headache when I think about coronavirus.	292 (70.4)	75 (18.1)	44 (10.6)	4 (1)	0.42±0.71
13	My body starts jittering when I think about coronavirus.	331 (79.8)	49 (11.8)	30 (7.2)	5 (1.2)	0.29±0.65
14	I get goose bumps when I think about coronavirus.	344 (82.9)	42 (10.1)	23 (5.5)	6 (1.4)	0.25±0.65
15	Coronavirus has become my nightmare.	287 (69.2)	57 (13.7)	59 (14.2)	12 (2.9)	0.51±0.84
16	I have less physical activity because of my fear of coronavirus.	175 (42.2)	91 (21.9)	121 (29.2)	28 (6.7)	1.01±0.99
17	I find it hard to talk with others about coronavirus.	202 (49.2)	68 (16.4)	107 (25.8)	36 (8.7)	0.93±1.04
18	I feel my heart beating when I think about coronavirus.	214 (51.6)	58 (14)	93 (22.4)	50 (12)	0.94±1.1
	Total, Mean±SD (Range)			19.82±12.77 (0–54)		

We also found that students with higher age, higher academic degree and year, and a history of working in COVID-19 wards had more extensive knowledge as to COVID-19. A prior study [16] in Turkey also reported that senior medical students had a more extensive knowledge of COVID-19 than their junior counterparts. Senior NMSs attend clinical settings for their clinical courses and may opt for work in hospital

during their study either as volunteers or as paid healthcare providers; thereby, they can acquire greater knowledge about COVID-19 during their clinical practice.

The mean score of fear about COVID-19 in the present study was relatively high. Efforts are underway around the world to address the impact of COVID-19. Several earlier studies [30], [35], [36] also reported the same finding. However, some studies [37], [38] reported moderate fear about COVID-19 among medical sciences students in Europe. Fear is an emotional reaction and is affected by many different personal, psychological, and sociocultural factors like vulnerability to diseases, intolerance of uncertainty, anxiety, and personality characteristics [39], [40], [41].

Moderate fear about COVID-19 has a significant role in increasing individuals' motivation for adherence to recommended health-related behaviors, while severe fear has destructive psychological effects on students' lives [37]. Continuous monitoring of fear about COVID-19 among medical sciences students is essential during the COVID-19 pandemic in order to minimize its destructive effects.

We also found that PhD students had greater fear about COVID-19 than master's students. Some studies [37], [38] have reported lower fear about COVID-19 among students with higher academic degree and some studies [30], [42] reported no significant relationship between students' fear about COVID-19 and their academic degree. These contradictory results highlight the necessity of further studies in order to produce more certain evidence regarding the relationship of fear about COVID-19 and academic degree among students.

We also found that midwifery students had significantly greater fear about COVID-19 than their nursing counterparts. A prior study [37] reported that compared with other students, medical sciences students had greater fear about COVID-19 due to having more social contacts. Our participants were also NMSs who usually have extensive social contacts. We did not find any study reporting the relationship of students' field of study with their fear about COVID-19. Further studies in this area are needed to determine the reasons for greater fear about COVID-19 among midwifery students. Understanding students' fears about their mental and physical health is a major issue that will be useful for future interventions.

Study findings indicated that the mean score of NMSs' anxiety about COVID-19 was mild. The most important concern of the study participants was related to the possibility of transmitting COVID-19 to others. In line with this finding, a previous study [43] reported that medical and nursing students had experienced some levels of anxiety and fear about transmitting COVID-19 to their families. Such anxiety and fear can result in psychological distress [11]. During their clinical education, medical sciences students are in direct contact with patients and are more likely to transmit COVID-19 to others. Therefore, they experienced greater fear and anxiety about such transmission. The authorities of medical sciences universities need to provide their students with education about how to best protect themselves and others against COVID-19 and should use effective strategies for managing students' fears and anxiety as to COVID-19 transmission to others.

The level of anxiety among midwifery students was also greater than nursing students in the present study. A study in Turkey also reported intensive anxiety about COVID-19 among 972 midwifery students who attended clinical settings [44]. We found no comparative studies on the levels of anxiety and fear about COVID-19 in nursing and midwifery students, so further research in this area is recommended.

Anxiety about COVID-19 among students who lived in university dormitory was significantly greater than for those who lived with their families. A study in China [45] also reported concerns over COVID-19 among students in university dormitories. Students in dormitories are far from their families, may receive less family support, and thus may be more emotionally affected by the COVID-19 pandemic. The findings can be useful as a basis for mental health planning directed at university students and in directing the efforts and programs of health officials and universities to better control COVID-19 and its further spread.

Our findings also found that students with no history of participation in educational programs on COVID-19 had greater fear and anxiety about COVID-19. Previous studies [41], [46] reported the effectiveness of quality education and preventive measures in managing the psychological consequences of anxiety and fear about COVID-19. The authorities of medical sciences universities need to provide students with coherent education about strategies for effective fear and anxiety management, particularly in the COVID-19 pandemic.

It is essential for universities to make effective efforts to design and implement student mental health and educational programs during the epidemic. Providing appropriate psychological support to students can be effective in improving their coping strategies and reducing tensions. The present study is not free of limitations since the data gathering was online. Thus, it is not possible to control self-reporting answers and possible misunderstanding of questions. Another limitation of the study was that only nursing and midwifery students were considered, which could limit the generalizability of the results to other disciplines, and it is suggested that a similar study be conducted in other disciplines of Medical and Non-medical sciences.

4.   CONCLUSION

The findings provide insights on the knowledge, fear, and anxiety of NMSs' during the COVID-19 pandemic. The results indicated that NMSs have excellent knowledge, relatively great fear, and mild anxiety as to COVID-19. These findings highlight some of the factors influencing students' anxiety and fear during this epidemic. NMSs have inadequate knowledge about the necessity of seeking prompt advice after exposure to COVID-19 and have great anxiety about transmitting COVID-19 to others. The results also highlighted the necessity of more flexible educational programs for NMSs on critical conditions such as the COVID-19 pandemic. The authorities of medical sciences universities need to closely monitor their students for fear and anxiety, particularly during epidemics and pandemics, and provide them with safe and effective need-based education. These findings may be used as a basis for establishing educational and mental health programs for NMSs.

We need to be aware of the epidemic's effects on all aspects of education, in order to identify consequences promptly and help students cope with these challenges. Identifying the impact of an epidemic on education and planning for its consequences can be helpful in dealing with future crises and help mitigate the mental health burden. Further research is needed on how best to manage the disaster and assess risk in order to prevent future public health crises. Our findings may be beneficial in defining the course of further research.

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