Fear and stress related to COVID-19 and associated factors among undergraduate nursing students in Qatar

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ABSTRACT

Background: The emergence of the coronavirus disease (COVID-19) has had an impact on nearly every human being with millions of related infections and deaths. The negative impact of the pandemic on individuals' mental health such as fear and stress, particularly among university students, have been reported. While the switch to online teaching and learning played an important mitigating role, it also had presented additional challenges to students' mental health.
Aim: To examine the prevalence of fear and stress among undergraduate nursing students in Qatar and the factors associated with fear of COVID-19.
Method: A cross-sectional design. An online survey was sent to students at the University of Calgary in Qatar.
Results: 135 participants completed the survey. The findings showed differences in fear of COVID-19 and stress and satisfaction with the measures proposed by the academic institution based on participants' demographic and COVID-19 profiles. Furthermore, fear of COVID-19 was associated with the age group (26–35), academic year level, and satisfaction with the measures proposed by the academic institution.
Conclusion: The study found that switching teaching and learning online had a negative impact on participants' fear and stress. Several strategies were suggested to alleviate students' fear and stress and support them during future pandemics.

1. Introduction

The emergence of the coronavirus disease (COVID-19) has impacted nearly every human being. Since the World Health Organization (WHO) declared COVID-19 a pandemic (Abed Alah et al., 2022; Heymann & Legido-Quigley, 2022) in March 2020, millions of infections and deaths related to COVID-19 have been recorded worldwide. To control the spread of the disease, governments worldwide have implemented quarantine, social isolation, travel restrictions and tight border controls, and lockdowns (Heymann & Legido-Quigley, 2022). These measures included academic institutions such as schools and universities where online education was used instead of traditional face-to-face instruction (Adedoyin & Soykan, 2020).

In late 2020, potent COVID-19 vaccines started to be rolled-out globally. These vaccines were found to reduce the severity of the

disease and significantly decrease mortality rates (Heymann & Legido-Quigley, 2022). As a response, several government-imposed restrictions such as lockdowns, travel bans, and social isolation were gradually lifted (Heymann & Legido-Quigley, 2022).

While vaccines reduced mortality and morbidity rates of COVID-19, the psychological impact of the pandemic continued to linger as the pandemic continued to be a threat. Reports continued to emerge about the negative impact of the pandemic on individuals, particularly among university students (Faisal et al., 2022). For example, a large longitudinal study that assessed the psychological impact on college students ($n = 164,101$) in China reported a high prevalence of stress, anxiety, and depression (35 %, 12 %, and 22 %, respectively) during the first COVID-19 wave that occurred between January to March 2020 (Y. Li et al., 2021). In a sample of Jordanian college students ($n = 1300$), depression, anxiety, and stress during the pandemic were reported by 79 %, 68 %,

and 59 % students respectively (Hamaideh et al., 2022). Comparable results were also reported among college students elsewhere, such as in Ecuador (Rodríguez-Hidalgo et al., 2020), and Bangladesh (Faisal et al., 2022).

Among nursing students, a systematic review of the literature that included 17 cross-sectional studies from different nations reported a high prevalence of Covid-19-related mental health problems (Mulyadi et al., 2021). The authors had reported pooled prevalence of fear (41 %), anxiety (32 %), stress (30 %), depression (52 %), and sleep disturbances (27 %). While the contagious state of COVID-19 might have had a significant psychological impact on college students, nursing students were found to face additional challenges. For instance, online teaching and learning during the Covid-19 pandemic was associated with technological burdens (Majrashi et al., 2021; Wallace et al., 2021). Furthermore, factors such as fewer interactions with peers and instructors, and the absence of an experiential learning environment that was important for their professional nursing careers were also found to negatively impact nursing students during the pandemic (Thapa et al., 2021).

While several studies had reported on the extent of mental health issues associated with the pandemic among nurses and other healthcare workers in Qatar (Abed Alah et al., 2021; Nashwan et al., 2021; Wadoo et al., 2021), none were conducted among undergraduate nursing students in Qatar. The worldwide COVID-19 pandemic has significantly impacted every aspect of human life, including education, leading to unprecedented levels of stress and fear, particularly among healthcare students. Nursing students in Qatar, like their counterparts worldwide, have been facing unique challenges, fear of infection, and constant adaptation to changing educational scenarios due to the pandemic. However, there is a noticeable lack of systematic research assessing the prevalence of fear and stress among undergraduate nursing students in this country and identifying the factors related to fear of COVID-19. Conducting a study on this topic is important to gain insights into the emotional well-being of this vulnerable population, identify key stressors, and provide evidence-based recommendations for educational institutions and policymakers. This will allow for the development of targeted interventions and supportive strategies to help students cope with the pandemic's impact. The study could also contribute valuable data to the global understanding of how the pandemic is affecting healthcare students' mental health. Hence, such a study is not only justifiable but necessary in the present context. The study was therefore designed to examine the prevalence of fear and stress among undergraduate nursing students in Qatar and the factors associated with fear of COVID-19. The findings of this study will inform the planning of preventive measures to address and mitigate undergraduate nursing students' fear and stress during similar pandemics or health crises.

2. Methods

2.1. Design and sample

A cross-sectional design was used, and an online survey (Appendix A) was sent to students at the University of Calgary in Qatar. A convenience, non-probability sampling technique was used to recruit participants in this study. Participants were included in the study if they could speak and write in English, were above 18 years of age and over, and were enrolled full-time in UCQ's undergraduate nursing: Bachelor of Nursing Regular Stream (BNRT) or Post-Diploma Bachelor of Nursing (PDBN) programs in Qatar. Exclusion criteria included those who had joined the nursing program after December 2021. The sample size for our study was ascertained through the G*Power (version 3.1.9.2) sample calculation software, employing multiple regression to guide this calculation given its status as the primary statistical test in the study. The parameters utilized for this calculation encompassed a medium effect size (0.15), an alpha level of 0.05, a statistical power of 0.80, and 11 predictors. Based on these inputs, it was deduced that the study required a sample size of 123 participants.

2.2. Data collection

An anonymous online survey was sent to all nursing students at the university. The data were collected between May 2022 and June 2022. The survey link was sent to the potential participants through the Student Services office. Potential participants received three reminder emails within 20-days to encourage their participation in the study. The study questionnaire was distributed using the QualtricsXM web-based survey platform. The potential participants were offered a chance to complete the survey by accessing the link in the email or scanning the QR code and responding on their smartphones.

3. Measures

Two validated instruments were included in the study questionnaire to obtain the necessary information for this study: the Fear of COVID-19 Scale and the Perceived Stress Scale (PSS)., Further, a single item question about satisfaction by the measures taken by the university during COVID-19 was added using a five-point scale ranging from "very dissatisfied" to "very satisfied". Also, the survey obtained background information about participants' age, gender, marital status, academic year level, academic program, vaccination status, and history of COVID-19 infection. Finally, one open-ended question, "What can UCQ do to support you in the event of another pandemic?" was added.

3.1. Fear of COVID-19 scale

The Fear of COVID-19 scale was used to assess the participants' perception of fear of COVID-19 (Ahorsu et al., 2022). The scale is composed of 7-item on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total score ranges from 7 to 35, where higher scores represent higher levels of fear of COVID-19. The scale demonstrated good internal consistency reliability with Cronbach's α of 0.82 (Ahorsu et al., 2022).

3.2. Perceived stress scale

The PSS is a 10-item instrument widely used to assess stress levels in people aged 12 and above (Cohen et al., 1983). The scale items' scores range from 0 (never) to 4 (very often), with overall scores ranging from 0 to 40. Scores <14 indicate low stress; scores ranging between 14 and 26 would consider moderate stress, and scores above 26 would be considered high perceived stress. The PSS showed acceptable internal consistency with Cronbach's $\alpha = 0.70$ (Roberti et al., 2006).

3.3. Statistical analysis

Quantitative data analysis was performed using SPSS version 27. Descriptive statistics were reported for means, standard deviations, frequencies, and percentages of all scales, subscales, and participant variables. Internal consistency reliability was obtained for the multi-item scales. An independent *t*-test and one-way ANOVA were performed to test whether the fear of COVID-19 and stress differed in students' demographic characteristics and vaccine treatment. Welch's *t*-test was chosen when there was a large difference between group sizes. To identify the predictors of fear of COVID-19, multiple linear regression was performed. The level of significance was set to be $P < 0.05$ in all statistical tests.

Participants' responses to the open-ended question "What can UCQ do to support students in similar future pandemics?" were independently analyzed for themes and subthemes by two of the research team members (VK and AM). Following this step, a preliminary list of themes and subthemes were identified by each. Through discussion, the two researchers arrived at a final list of themes and subthemes by consensus.

3.4. Ethical approvals

This project was preapproved by two ethics boards: the Conjoint Health Research Ethics Board (REB21-1957) of the University of Calgary in Canada, and the Independent Ethics Committee of the Primary Health Care Corporation in Qatar (REB21-1957). The participants received an anonymous link which also included a consent to participate in the survey. As a result, the research team could not access the participants' identifying information. All information obtained from participants were coded in the SPSS software and kept in the lead researcher's (VK) computer in a locked office at the university campus with a 24/7 security surveillance.

4. Results

4.1. Recruitment and sample characteristics

A total of 135 nursing students participated in the study. The majority of the participants were females (90 %) and between 18 and 25 years old (85 %). Most participants were single (87 %), and half were junior students (students in years 1 and 2) (51.1 %). Almost half of them had been infected with COVID-19, and two-thirds received three doses of the COVID-19 vaccine. Finally, most participants were in the BNRT nursing program (92 %). See Table 1 for more details.

4.2. Fear of COVID-19

The participants in this study reported having experienced moderate fear of COVID-19 (*Mean* = 18.02, *SD* = 5.99). The results showed that senior students (*Mean* = 19.2, *SD* = 5.45) compared to junior students (*Mean* = 16.9, *SD* = 6.34) reported significantly greater fear of COVID-19, $t(133) = 2.26$, $p < 0.05$. No other significant differences were found based on other demographics or COVID-19 profiles. In addition, the Fear of COVID-19 scale demonstrated good internal consistency reliability with a Cronbach α of 0.87. See Table 2 for more details.

4.3. Perceived stress

The participants in this study reported moderate stress levels (*Mean* = 21, *SD* = 5.91) with 19.3 % reporting high perceived stress. The results showed that single participants (*Mean* = 21.48, *SD* = 5.87) perceived more stress compared to married participants (*Mean* = 17.13, *SD* = 5.59), $t(18.9) = 2.82$, $p < 0.05$. Furthermore, BNRT students (*Mean* = 21.38, *SD* = 5.82) perceived more stress than PDBN students (*Mean* = 16.73, *SD* = 5.53), $t(12.5) = 2.66$, $p < 0.05$. Finally, to assess the difference in perceived stress and age groups, one-way ANOVA was used for data analysis. The findings showed that there was a significant difference between different age groups, $F[2132] = 4.44$, $p < 0.05$. Moreover, *post-hoc* analysis with Tukey's (HSD) revealed that participants with ages between 18 and 25 years (*Mean* = 21.47, *SD* = 5.83) had significantly higher perceived stress compared to participants with ages above 36 years (*Mean* = 15.80, *SD* = 5.69). No other significant differences were found. In addition, the PSS demonstrated good internal consistency reliability with a Cronbach α of 0.79. See Table 3 for more details.

4.4. Satisfaction with the measures taken by the university during the COVID-19 pandemic

The participants in this study reported a high level of satisfaction with measures taken by the university during COVID-19 (*Mean* = 4.03, *SD* = 0.99). However, after assessing the level of satisfaction between different demographical groups and COVID-19 profiles, it was found that participants who were infected with COVID-19 (*Mean* = 3.83, *SD* = 1.08) reported lower satisfaction levels compared to participants with

Table 1
Sample characteristic ($n = 135$).

Characteristic	Category	Frequency	Percentage
Age (years)	Between 18 and 25	115	85.2
	Between 26 and 35	10	7.4
	>36	10	7.4
Gender	Male	15	11.1
	Female	120	88.9
Marital status	Single	117	86.7
	Married	15	11.1
	Others	3	2.2
Academic program	BNRT	124	91.9
	PDBN	11	8.1
Academic year[a]	Junior	69	51.1
	Senior	48.8	48.8
Vaccination	Three doses	89	65.9
	Two doses	43	31.9
History of COVID-19 infection	Yes	60	44.4
	No	75	55.6

[a] Junior = Student in year 1 &2, Senior = Student in year 3&4.

Table 2
Difference in fear of COVID-19 based on participants' demographic and COVID-19 profiles.

Variable	Group	n	Mean	SD	F or t (df)	p
Gender	Male	15	17.33	5.58	0.50 (18.4)	0.62
	Female	120	18.10	6.06		
Marital status	Single	117	18.12	5.98	0.19 (17.4)	0.85
	Married	15	17.8	6.29		
Academic program	BNRT	124	18.1	6.10	0.68 (13.29)	0.51
	PDBN	11	17.0	4.63		
COVID	Yes	60	17.30	6.80	1.22 (108.67)	0.23
Infection	No	75	18.6	5.23		
Vaccination	Three doses	89	18.02	5.42	0.10 (66.06)	0.93
	Two doses	43	18.14	7.16		
Age (years)	Between 18 and 25	115	17.83	5.84	2.30 (2132)	0.10
	Between 26 and 35	10	21.70	7.24		
	>36	10	16.50	5.74		
Academic year	Junior	69	16.90	5.45	2.26 (133)	0.03
	Senior	66	19.20	6.34		

Table 3
Differences in perceived stress based on participants' demographic and COVID-19 profiles.

Variable	Group	n	Mean	SD	F or t (df)	p
Gender	Male	15	20.53	5.30	0.36 (18.80)	0.73
	Female	120	21.05	6.01		
Marital status	Single	117	21.48	5.87	2.817 (18.19)	0.01
	Married	15	17.13	5.59		
Academic program	BNRT	124	21.38	5.82	2.66 (12.05)	0.02
	PDBN	11	16.73	5.53		
COVID	Yes	60	20.5	6.19	0.87 (121.75)	0.39
Infection	No	75	21.40	5.71		
Vaccination	Three doses	89	20.84	6.11	0.45 (90.55)	0.65
	Two doses	43	21.33	5.57		
Age (years)	Between 18 and 25	115	21.47	5.83	4.44 (2132)	0.01
	Between 26 and 35	10	20.80	5.05		
	>36	10	15.80	5.69		
Academic year	Junior	69	20.52	6.18	0.96 (133)	0.34
	Senior	66	21.5	5.33		

no infection history (*Mean* = 4.19, *SD* = 0.90), *t*(114.49) = 2.04, *p* < 0.05. No other significant differences were found in satisfaction with the measures taken by the university during the COVID-19 pandemic. See Table 4 for more details.

4.5. Predictors of fear of COVID-19

Multiple linear regression was performed to assess the factors that might have predicted the fear of COVID-19. After conducting a univariate analysis, only predictors with a *p* value of <0.20 were included in the final model. The results of the regression model explained 16.9 % of the variance in fear of COVID-19. The age group (26–35) (β = 0.20, *p* < 0.05), academic year level (β = 0.18, *p* < 0.05), perceived stress (β = 0.29, *p* < 0.05) and satisfaction with the measures implemented by the university (β = −0.22, *p* < 0.05) were significant predictors of fear of COVID-19 (*F* = 6.62[4130], *p* < 0.001). See Table 5 for further details.

4.6. Qualitative data analysis

Five themes and 11 subthemes emerged from the analysis of the students' narrative responses to the question: "What can UCQ do to support students in similar future pandemics?" While we have identified distinct themes and subthemes, some of these are inter-related as shown below. These responses are described below.

Covid-19 Safety Measures. Students found UCQ's safety measures helpful, and they suggested continuation of such measures throughout. One participant wrote "I think the school have done a great job". Another student stated "UCQ took quite good measures to ensure the safety of their students". However, several students also mentioned some of the measures were challenging. For instance, during their clinical placements they found it challenging to keep so2cial (safe) distancing. For instance, one participant wrote "Some rules do not make sense, like when having rest in lounge room, of course I won't make distance with my friends. It's a shareable couch!"

Online Teaching/Learning. Students expressed mixed views about UCQ's strategy for continuation of students' teaching and learning. While some students valued the online mode of learning, others expressed preference for face-to-face learning. One participant wrote "Allow flexibility in learning, and provide safety to students by making them stay and study at home". On another matter, students commented about their coursework workload during the online learning. They suggested

Table 4
Differences in satisfaction with the university's COVID-19 measures based on participants' demographic and COVID-19 profiles.

Variable	Group	n	Mean	SD	F or t (df)	p
Gender	Male	15	4.00	1.25	0.10 (16.12)	0.92
	Female	120	4.03	0.96		
Marital status	Single	117	4.06	0.99	1.16 (17.43)	0.26
	Married	15	3.73	1.03		
Academic program	BNRT	124	4.01	0.99	0.84 (11.78)	0.42
	PDBN	11	4.27	1.00		
COVID	Yes	60	3.83	1.08	2.04 (114.49)	0.04
Infection	No	75	4.19	0.90		
Vaccination	Three doses	89	4.11	0.90	0.82 (69.33)	0.42
	Two doses	43	3.95	1.11		
Age (years)	Between 18 and 25	115	4.08	0.97	2.22 (2132)	0.11
	Between 26 and 35	10	3.40	1.07		
	>36	10	4.10	1.10		
Academic year	Junior	69	4.17	1.10	1.74 (133)	0.08
	Senior	66	3.88	0.85		

Table 5
Factors predicting fear from COVID-19.

Predictor	B	Std. error	β	t	p
Age (26–35)	4.774	1.869	0.209	2.554	0.012
Academic year level	2.113	0.983	0.177	2.151	0.033
Depression	−0.077	0.179	−0.051	−0.428	0.669
Anxiety	0.103	0.225	0.058	0.459	0.647
Insomnia	0.206	0.106	0.181	1.944	0.054
Stress	0.196	0.120	0.193	1.629	0.106
Satisfaction	−1.248	0.508	−0.206	−2.456	0.015

considerations for decreasing the number of assignments and examinations as a method of assessment of their academic and clinical performance. Another participant wrote "Allow flexibility and decrease expectations". Another student wrote "It would be good to limit the amount of workload given during online classes compared to face to face".

Mental Health Support. This theme and its subthemes were common among most students. They expressed the need for mental and emotional support, counselling, and being taught about how to cope with stress, which they experienced during both their theory classes and clinical placements. They suggested the establishment of support groups. Examples of statements by participants included "Provide mental health individual and group counselling sessions"; "Provide emotional support needs as required or awareness of mental stress which can elevate during a pandemic". Finally, one student wrote "Train instructors with more understanding of students personal situation".

Clinical Placements. In addition to participants' suggestions under the *Covid-19 safety measures*, they also suggested further improvements to their clinical placements. For example, some suggested to make them optional. One participant wrote "Make clinical practicum optional when possible".

Communication. Students expressed the need for continued communication from UCQ and faculty about the pandemic situation to keep them informed and up-to-date about the pandemic situation and necessary public health measures. They felt structured and ongoing communication would sustain their awareness of the risks associated with Covid-19 and continued reminders of adherence to the necessary safety measures. One student wrote "[provide] information to maintain support and resources to protect ourselves better".

Overall, the students expressed a mix of responses to the question about measures that UCQ could adopt in the event of future pandemics of this nature.

5. Discussion

The aim of this study was to examine the prevalence of fear and stress among undergraduate nursing students in Qatar and the factors that were associated with fear of COVID-19. Overall, the participants experienced fear and stress during the COVID-19 pandemic with some variations based on demographic and COVID-19 profiles.

5.1. Fear of COVID-19

Nursing students experienced moderate levels of fear of contracting the COVID-19 virus. This finding is supported by other research studies. For instance, a systematic review of 17 cross-sectional studies from different countries reported that fear of COVID-19 among nursing students was a common concern (Mulyadi et al., 2021). A descriptive correlational study of anxiety and fear among nursing students in Turkey showed that there was a positive correlation between anxiety and fear scores as measured by the Fear of COVID-19 scale (Alici & Copur, 2022). Another finding in our study was that students in the senior years experienced significantly more fear than junior students. This is contrary to the findings of another study in Philippines that first year students were most fearful compared to senior students (Alexis et al., 2021).

These authors attributed this finding to the extensive knowledge and skills senior students had gained from their studies. A plausible explanation for our finding might be that senior students had greater contact with patients due to their clinical practice than junior students.

5.2. Perceived stress

Our participants reported moderate levels of stress. Moderate stress levels were also reported by Aslan and Pekince (2021) in their study of nursing students in Turkey using the PSC (Aslan & Pekince, 2021). As well, other researchers studying stress among college students in Jordan (Hamaideh et al., 2022) found similar findings. Shifting in-person classes to online has been reported to have caused significant levels of stress among students (Masha'al et al., 2020; Sheroun et al., 2020). During the COVID-19 pandemic, one of the measures instituted by UCQ was to adopt online classes as decreed by the State of Qatar. A scoping review of 13 articles about stressors among nursing students showed that the COVID-19 pandemic period had been stressful for nursing students (Majrashi et al., 2021). Further, one systematic review showed high prevalence of stress among the students (Mulyadi et al., 2021). In our study, students who were single perceived significantly more stress than those who were married. A probable explanation for this might be the supportive role spouses may have played in the lives of students. Also, those in the BNRT program experienced significantly higher stress levels than those in the PDBN program. This might be probably explained that BNRT students might have been younger than those in the PDBN program. This might be supported by our finding that younger students reported higher levels of stress than older students.

5.3. Satisfaction with university's measures during the pandemic

Based on our findings, it appears that the level of satisfaction with the university's safety measures was related to a history of being infected with the virus. Those who were infected reported lower satisfaction levels compared to those who had not been infected. A cross-sectional study in Middle Eastern countries reported that being infected with COVID-19 was associated with reduced satisfaction with the measures taken for the prevention of the spread of the disease (Itani et al., 2022). Therefore, a probable explanation for the finding in our study might be that getting infected despite the safety measures, might have lost their confidence in the measures and which might have influenced their satisfaction.

5.4. Predictors of fear

Our findings showed that the age group 26–35, academic year level, and satisfaction with measures implemented by UCQ were significant predictors of fear, but stress was not. Based on the literature, given the nature of fear – that is a response to danger or threat – we expected to find emotional responses to the COVID-19 such as stress or other demographic factors such as marital status as predictors. For example, the study by Alici and Copur (2022) of anxiety and fear among nursing students showed that there was a positive correlation between anxiety and fear (Alici & Copur, 2022). A probable explanation for this variance might be differences in the populations studied. Another probable explanation might be the timing of our study. While the study by Alici and Copur (2022) was conducted immediately after the World Health Organization declared COVID-19 a pandemic in 2020, our study was conducted in the spring of 2022, closer to the tail end of the pandemic and when students had already returned to campus for in-person learning.

5.5. Qualitative data

An analysis of the nursing students' responses to the single question "What can UCQ do to support students in similar future pandemics?"

identified five themes: COVID-19 safety measures with three subthemes, online teaching/learning with two subthemes, mental health support with two subthemes, clinical placements with two subthemes, and communication with one subtheme. In general, while the students were satisfied with the safety measures instituted by UCQ, they also expressed some concerns such as keeping social distancing during clinical placements. While some students expressed concerns about upholding COVID 19 safety guidelines during clinical placements, these are critical for the application of their theoretical knowledge and skills. Improvements in clinical placements guidelines in future pandemic events might mitigate these concerns. They also voiced the ongoing need for mental health support such as counselling and setting up support groups. They also voiced concerns about the online teaching and learning method of studies. They found this mode very stressful due to separation from classmates and instructors. They emphasized the importance of continuous communication by the university and instructors to maintain their awareness of the risks associated with COVID-19 and the necessity for continued adherence to instituted safety measures. A cross-sectional study in nine nursing schools in Belgium had reported similar findings such as the need for more psychosocial supports, the need to establish regular contacts with their instructors during clinical placements, and the need for more space to relax (Ulenaers et al., 2021).

5.6. Strengths and limitations

This study had several strengths including the use of valid and reliable instruments to assess fear and perceived stress in students. Data collection was anonymized, and participation was voluntary. The study also had some limitations that need to be noted. We were only able to attract only about 25 % of the student population. This was due to several factors such as the timing of the study had coincided with term end examinations, and research burden because students had been subjected to other research studies. Another limitation in our study was that we did not examine students' knowledge about COVID-19 and their coping skills. Future studies should examine these important aspects of learning during a pandemic.

5.7. Implications to practice

Fear and stress are serious concerns during pandemics that negatively influence students' fear and stress and consequently the quality of their learning and academic performance. Educators need to be vigilant about such influences and need to implement proactive measures to monitor students closely and to intervene promptly as the need arises. Instructors need to be trained in recognizing stress in students to provide prompt intervention. Counselling and other mental health supports should be made available and accessible to the students. As well, students should be taught coping skills to better manage their stress.

6. Conclusions

The COVID-19 pandemic had a devastating impact on the world's population. It also had a negative impact on undergraduate nursing students. This study highlights the need for higher education institutions to implement effective measures to mitigate the negative effects. Importantly, universities should prioritize mental health support, provide clear communication, and offer flexibility in academic requirements during such crises. Future research could extend to include interventions to manage fear and stress among nursing students during similar health crises.

CRediT authorship contribution statement

Conceptualization of study and design: VK; Methodology: YY; Software, acquisition, analysis of data: YY; Data Curation: VK, YY, FK, AM; Drafting the manuscript: All authors drafted their respective sections;

Writing – review & editing: All authors; Supervision: VK; Submission of the manuscript and corresponding author: MAA.

Declaration of competing interest

The authors declare no conflict of interest.

Appendix A. Fear and stress survey

Demographic characteristics

Demographic characteristics
1. Age: ☐ 18–25   ☐ 26–35   ☐ 36–45   ☐ 46–55   ☐ ≥56
2. Gender: ☐ Male   ☐ Female
3. Marital status: ☐ Single   ☐ Married   ☐ Divorced/separated/others
4. Academic program ☐ BNRT   ☐ PDBN
5. Academic year level ☐ First Year   ☐ Second Year   ☐ Third Year   ☐ Fourth Year
6. Mode of learning at present time: ☐ Face-to-face   ☐ Online   ☐ Mixed/online and face-face
7. Have you taken vaccines of COVID-19? ☐ Yes 2 doses   ☐ Yes 1 dose   ☐ No   ☐ Prefer not to say
8. Confirmed case of COVID-19 since March 2020: ☐ Yes   ☐ No
9. If applicable, were you in clinical placement during the pandemic since March 2020? ☐ Yes   ☐ No
10. If yes, please specify the type of placement setting. >………………………..

Code: BNRT: Bacherlor of Nursing Regular Tract; PDBN: Post Diploma Bachelor Nursing.
Instruments:

Fear of COVID-19 Scale

Instructions:

Please respond to each item by ticking (√) one of the five (5) responses that reflects how you felt, thought or acted toward COVID-19 (termed here 'Corona') or other variants since its onset in March 2020

	Fear of COVID-19 Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I am most afraid of coronavirus-19.					
2	It makes me uncomfortable to think about coronavirus-19.					
3	My hands become clammy when I think about coronavirus-19.					
4	I am afraid of losing my life because of coronavirus-19.					
5	When watching news and stories about coronavirus-19 on social media, I become nervous or anxious.					
6	I cannot sleep because I'm worrying about getting coronavirus-19.					
7	My heart races or palpitates when I think about getting coronavirus-19.					

Source: Ahorsu et al., 2022

Perceived Stress Scale-10

The questions in this scale ask you about your feelings and thoughts since the onset of Covid-19 or other variants in March 2020. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

		Never	Almost never	Sometimes	Fairly often	very often
1	In the last month, how often have you been upset because of something that happened unexpectedly?					
2	In the last month, how often have you felt that you were unable to control the important things in your life?					
3	In the last month, how often have you felt nervous and stressed?					
4	In the last month, how often have you felt confident about your ability to handle your personal problems?					
5	In the last month, how often have you felt that things were going your way?					
6	In the last month, how often have you found that you could not cope with all the things that you had to do?					
7	In the last month, how often have you been able to control irritations in your life?					
8	In the last month, how often have you felt that you were on top of things?					
9	In the last month, how often have you been angered because of things that happened that were outside of your control?					
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?					

Source: (Cohen et al., 1983).

		Very satisfied	Satisfied	Moderately satisfied	Dissatisfied	Very dissatisfied
1	Are you satisfied with the measures taken by UCQ?					

Open-ended question:

What can UCQ do to support students in similar future pandemics?

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