COVID-19–induced anxiety and protective behaviour among nursing students: A survey from western India

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Abstract

Introduction: The COVID-19 Pandemic has caused anxiety and stress among people. Nursing students, being an important link in the delivery of health care services, are always exposed to stressful situations which in turn put a great toll on their mental health. Moreover, the perceived risk of pandemics motivates people to embrace different protective measures so as to reduce any potential threats of an emerging health concern. **Objective:** The aim of this study was to assess the COVID-induced anxiety and protective behaviors among nursing students. **Methods:** Nursing students studying at 02 nursing institutes of Jodhpur, Rajasthan, India were enrolled for the study. The data were collected using COVID-induced anxiety scale and protective behaviors towards COVID-19 Scale. These scales were converted to online google forms, and the link was circulated among 370 nursing students through emails and WhatsApp. A total of 229 students submitted their responses within stipulated time and were included in the final data analysis. **Results:** The response rate of the survey was 62%. Evidently, nursing students had a moderate level of anxiety (mean score 31.28 ± 5.29) due to the COVID-19 outbreak. Overall protective behavior mean score was 56.63 ± 6.4 which reflects that students were following higher quality of protective behaviors. There is a negative linear correlation between anxiety score and protective behavior score. **Conclusion:** The nursing students exhibited a moderate level of anxiety, and routing protective behaviors were frequently performed by these students. There is a timely need to plan and implement interventions for nursing students so as to make them self-capable to resolve psychosocial issues, especially during disease outbreaks.

Keywords: Anxiety, COVID-19, nursing students, protective behavior

Introduction

The whole world is shattered by coronavirus disease (COVID-19). Since the revelation of the outbreak in late December 2019, the burden has continued to increase exponentially across the globe. [1-3] In India, the first case of COVID-19 was reported in January, 2020. Thereafter, two similar cases were reported in February 2020. With the sharp escalation in the number of active cases, India stands on the list of worst-hit countries.[4,5]

On a larger scale, the outbreak of any pandemic is widely perceived by people as a very distressing situation. The current COVID-19 situation is having an enormous psychological and emotional impact on every stratum of society.[6,7] Various research studies conducted across the COVID hit countries indicate that uncertainty and doubt can lead to stress, anxiety, and adverse lifestyle behaviors.[8,9] Furthermore, the lockdown, excessive information broadcasting on various media platforms, home confinement, and restriction of social activities, etc., further tend to produce or exacerbate psychological problems.[2,10,11]

Nursing students are no more different from the current situation. Being an important link in health care delivery, nursing students are always trained in and surrounded by various

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stressful situations. During pandemics, these pupils are exposed to additional stressful factors, which make them extremely vulnerable and put an enormous threat on their psychological health. As the educational nursing institutes across the nation are closed for time being, negative emotions experienced by these young nurses are further compounded.[12]

The current scenario of COVID-19 is putting a great toll on psychological health, there is an urgent need for timely consideration to this aspect. As far as India is concerned, currently, there is very little reported information on the COVID-19 impact on the psychological health of nursing students. Moreover, the perception of people regarding risks associated with a sharp surge in morbidity and mortality persuades them to embrace different preventive behaviors to lower down any potential threats. Various studies demonstrate that a mild level of fear and worry motivates to adopt preventive measures but when this level is on the extreme side, usually people indulge themselves in faulty behaviors.[6,13]

So being considered as a major health concern and paucity of literature at the national level, the researchers are intended to measure COVID-19–induced anxiety and protective behaviors among nursing students. This psycho-behavioral surveillance is directed towards generating baseline data which would be the first step towards the institution of remedial measures.

Materials and Methods

Research design, setting, and sample

This online cross-sectional survey was conducted among nursing students. The data was collected in the month of September 2020–October 2020. Nursing students pursuing postgraduation and graduation in nursing in 02 Nursing Institutes of Jodhpur, Rajasthan, India were enrolled in the study. Inclusion criteria were the availability of students at the time of data collection and willingness of nursing students to participate in the study. The target sample size was determined using the formula N = Z² (1- α/2)(pq)/d² in which Zα =1.96, d = 5%, *P* = prevalence of anxiety = 75.5%.[14] Considering a 30% nonresponse rate, the sample size was estimated to be 370.

Data collection tools

Data collection tools consisted of sociodemographic data questionnaire which collected socio demographic details of the students. COVID-19–Induced Anxiety Scale (CIAS) developed by Riad *et al.*[15] was used to measure COVID-19–induced anxiety among nursing students. It is a 10 items Likert scale that measures anxiety on 5-points i.e. "Totally disagree (score 1)" and "Totally agree (score 5)." Cronbach's alpha coefficient of the scale is 0.78 which indicates good reliability. Anxiety levels were categorized as no anxiety (score 1–10), mild anxiety (score 11–20), moderate anxiety (score 21–35), and severe anxiety (score 36–50). Protective behaviors towards COVID-19 Scale (PBCS) was

used to evaluate nursing students' protective behavior against COVID infection. This is 14-item Likert scale which measures protective behavior on 5 points i.e. "1" refers to "Not at all" and "5" refers to "Always." Protective behaviors against COVID-19 were measured on three subdomains: Routine Protective Behaviors (RPB), Postexposure Protective Behaviors (PPB), and Postexposure Risky Behaviors (PRB). The higher total scores for each subscale and the overall scale refer to the higher quality of protective behaviors. The reliability coefficient is 0.85 which indicates good reliability. Permission from the authors was obtained to use the CIAS and PBCS in this study.

Data collection procedure

The data collection scales were converted to online google forms. A link to the survey form was circulated among nursing students studying at selected institutes through emails and WhatsApp. One week time was given to students for filling and submitting the form. The fully filled forms received within stipulated time period were thereafter coded and analyzed. Agreement to fill online survey was considered as a consent of students to be part of the study.

Ethics statement

Ethical clearance to conduct the study was obtained from Institute Ethics Committee (AIIMS/IEC/2020-21/3214 dated 08/09/2020). Permission was taken from the Principal/Head of the Institutes involved in the data collection process. The students were given a prior explanation about the purpose of carrying this study and assured of their anonymity and confidentiality of data.

Data analysis

Collected data were analyzed using SPSS 21.0 (IBM SPSS, Version 20.0. Armonk, NY: IBM Corp). Descriptive statistics such as frequency, %, mean, and SD were calculated to summarize socio-demographic variables. Inferential statistics such as Chi-square, correlation coefficient, and ranking of items were applied to infer the key variables. For all the associations, *P*-level was set as <0.05.

Results

Demographic details of students

A total of 229 nursing students out of 370 reverted with a filled survey form within the stipulated time. The response rate of this online survey was overall 62%. Nearly 62% of the students were within the age group of 21–25 years with mean age of 21.6 ± 2.8 years. The majority (82%) of the students were female. About 88.7% of students were from B.Sc. Nursing, and about 11.3% of the students were doing M.Sc. Nursing. As far as the year of study is concerned, about 33% of students were from B.Sc. Nursing 2nd year followed by 25.32% who were from B.Sc. Nursing 4th year. About 8% of the study sample was from M.Sc. Nursing 1st year. Nearly 66.8% of the students were studying in government nursing institutions. The majority (93%) of the students at the time of this study data collection were staying at

home. About 28.4% of the subjects' current staying place was falling into a containment zone [Table 1].

COVID-19 pandemic–induced anxiety among nursing students

The level of anxiety among nursing students because of COVID-19 is illustrated in Figure 1. About 75% of the subjects reported a moderate level of anxiety followed by 21.4% who experienced severe anxiety, whereas only 3.5% reported a mild level of anxiety due to the COVID-19 pandemic. The mean anxiety score was 31.28 ± 5.29 which infers that overall nursing students had a moderate level of anxiety due to the COVID-19 outbreak.

Protective behavior towards COVID-19

Table 2 depicts the domain-wise protective behavior mean score, mean %, and ranking. It is strikingly evident from the results that routine protective behavior has the highest mean % (88.92%) followed by post-exposure protective behavior (81.93%), and postexposure risk behavior (65.46%). Table 3 describes the Item-wise lowest and highest mean score under domains of protective behavior. The overall protective behavior mean score was 56.63 ± 6.4 which reflects that students were following higher quality of protective behaviors. Under routing protective behavior, the lowest mean score (3.86 ± 1.22) was reported for item no. 3 i.e. I do not visit any relatives or friends during the outbreak, whereas covering mouth and nose in public was the most used routing protective behavior (mean score 4.83 ± 0.68). For post-exposure protective behavior item no. 10 i.e. I should quarantine myself immediately if I have suspicious symptoms had the least mean score of 3.04 ± 1.409 and item no. 14 i.e. in case of suspicious infection or a confirmed case at home, I should notify the health authorities as soon as possible had the highest mean score of 4.72 ± 0.83. As far as post-exposure risk behavior is concerned, item no. 9 had the lowest mean score of 2.96 ± 1.4, whereas item no. 11 had the highest mean score of 3.82 ± 1.37.

Correlation between students' anxiety and protective behaviors scores

Table 4 reflects the correlation between anxiety and protective behavior mean scores. There is a negative linear correlation between anxiety score and protective behavior score ($r = -0.139$, $P = 0.035$) which is indicative that as anxiety decreases there is an increase in protective behavior practices [Figure 2].

As far as an association of anxiety levels and protective behavior toward COVID-19 with selected demographic variables is concerned, anxiety levels of students were found to have statistically significant association with the age of the students only ($P = 0.001$).

Discussion

With the impact of coronavirus infection on physical health increasingly documented, the impact on mental health cannot be

Table 1: Frequency and % distribution of sociodemographic details of subject (*n*=229)	
Variable	*f* (%)
Age (years)	
≤20	81 (35.4)
21-25	142 (62.0)
≥26	06 (2.6)
Mean age±SD (years)	21.6±2.8
Gender	
Female	188 (82.1)
Male	41 (17.9)
Professional Course	
B.Sc. Nursing	203 (88.7)
M.Sc. Nursing	26 (11.3)
Year of study	
B.Sc. 1st Year	22 (9.6)
B.Sc. 2nd Year	75 (32.8)
B.Sc. 3rd Year	48 (20.9)
B.Sc. 4th year	58 (25.3)
M.Sc. 1st Year	18 (7.9)
M.Sc. 2nd Year	08 (3.5)
Type of Nursing Institute	
Government	153 (66.8)
Private	76 (33.2)
Current stay	
Home	213 (93.0)
Hostel	16 (7.0)
Containment zone	
Yes	65 (28.4)
No	164 (71.6)

Table 2: Domain wise Protective behavior ranking					
Protective behavior	No. of items	Max. score	Mean score±SD	Mean %	Rank
Routine protective behavior	05	25	22.23±3.5	88.92%	I
Postexposure protective behavior	06	30	24.58±4.1	81.93%	II
Postexposure risk behavior	03	15	9.82±3.1	65.46%	III
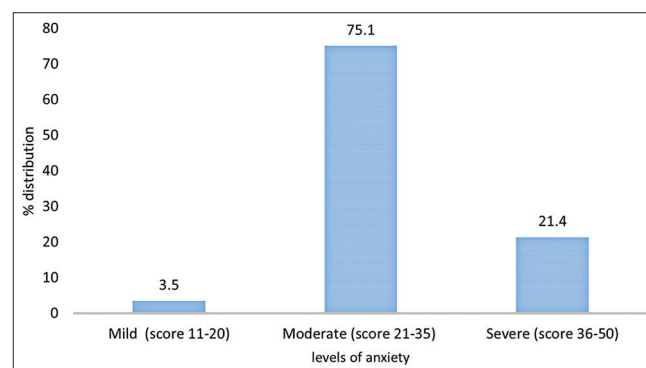
Figure 1: % distribution of subjects as per level of Anxiety

ignored. An increasing number of cases of fear, stress, anxiety, and depression have been documented across the globe.[16] Nursing students are also greatly impacted by this pandemic. With the shutting down of educational nursing institutes, negative emotions experienced by these young nurses are increased manifolds.

	Table 3: Item wise protective behavior mean scores (lowest and highest)	
Item no	Protective behavior	Mean score±SD
	Overall Protective behavior	56.63±6.4
	Routine protective behavior	
4	I do not visit any relatives or friends during the outbreak.	3.86±1.22
5	I cover my mouth and nose whenever I go out or in public.	4.83±0.68
	Post exposure protective behavior	
10	I should quarantine myself immediately if I have suspicious symptoms	3.04±1.409
14	If there is a suspicious infection or a confirmed case at home, I should notify the health authorities as soon as possible.	4.72±0.83
	Post exposure risk behavior	
9	In my opinion, quarantine can be terminated in advance if there are no abnormal symptoms.	2.96±1.4
11	I can take medicine without doctor's suggestion as long my suspicious are still mild.	3.82±1.37

Table 4: Correlation between anxiety and protective behavior mean scores			
Variable	Mean score±SD	Pearson correlation (*r*)	Significance (2 tailed)
Anxiety	31.28±5.29	-0.139	0.035*
Protective behavior	56.63±6.364		

*Significant at $P<0.05$ level
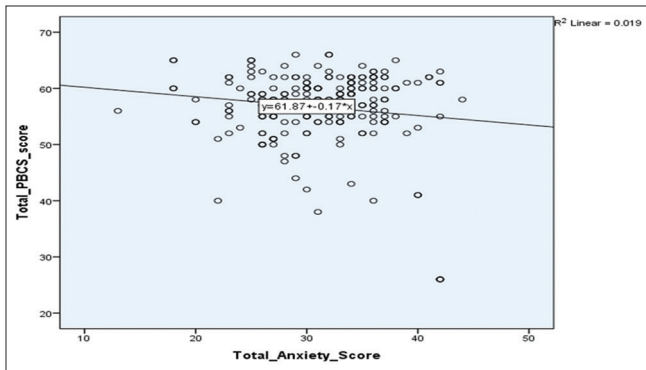
Figure 2: Scatter plot diagram showing the correlation between protective. behavior score and anxiety score

COVID-19 pandemic is a worrisome and anxiety-provoking situation. Worry, fear, and anxiety are usually expected and considered normal reaction during these times. But the unprecedented rise in the cases, associated mortality, non-availability of treatment, etc., put a significant impact on the physical health and in turn, the mental well-being of the population is also impacted to a greater extent.[17-19] The present study results reflects the moderate level of anxiety among nursing students. The results are consistent with the finding of a study conducted in Israel wherein about 43% of nursing students reported having moderate anxiety concerning COVID-19.[12] One of the research conducted in Yemen reported a high level of anxiety among 1/3rd of the study subjects.[20] Contrary to the results of the current study, Nemati *et al.*[17] evidently reported lower anxiety levels among nurses working in health care settings of Iran.

Following protective measures is the key to combat any disease outbreak. Any unprecedented situations such as the COVID-19 pandemic, which is an entirely new worrisome experience for everyone may affect these measures. It is strikingly evident from the results that the majority of the nursing students were following routine protective behavior such as washing hands, avoiding unnecessary travel, and wearing a mask, whereas the least followed measures were postexposure risk behavior. These results are aligned with results reported by Alrubaiee *et al.*[20] as the majority of the participants exhibited frequent practice of preventive measures towards COVID-19. However, these results were seemingly different from the results of a study conducted on Iranian medical students which found that nearly 94.2% of the students reported following all the preventive measures toward COVID-19.[21] Bashirian *et al.*[22] carried a study to identify protective behaviors of HCW against COVID-19 wherein the least used preventive behavior was the use of face masks at any time, whereas the most frequent preventive behavior was hand washing. One of other studies conducted in Myanmar reported that avoiding travel or trip to crowded areas and following respiratory etiquettes were the most emphasized protective behaviors followed by the subjects under study.[23] Contrary to these results, the use of masks was the least followed protective behavior among university students.[18]

Anxiety and use of protective behavior are highly dependent on multiple factors. Students' anxiety level was found to have statistically significant association with the age of the students only. Similarly, Huang and Zhao[24] reported the association of age with the depressive symptoms among people living in China during the COVID-19 epidemic.

Anxiety and use of protective behaviors to tackle this pandemic are correlated to each other. The results of the current study are indicative that a decrease in anxiety tends to better following protective behaviors by nursing students. The results are supported by findings of a study carried out by Alrubaiee *et al.*[20] in Yemen wherein anxiety and preventive behaviors reported to have a significant correlation.

The current study findings are suggestive that the nursing students being part of the health care team are too vulnerable to many psychological health issues that arise in the current

pandemic situation. A moderate level of anxiety has been reported by the students. Routing protective behaviors such as the use of masks and handwashing were the frequently performed measures by these students so as to safeguard themselves from contacting COVID.

Conclusion and Recommendations

The rapid escalation in corona cases across the globe has created panic among people. Nursing students, being in direct contact with the patients in health care facilities, are always at risk to contact the deadly virus. This fear and worry poses a great mental turmoil and impacts the psychological health of the students. The study has generated baseline data with respect to the effect of the COVID-19 on the psychological health of nursing students in the western region of India. Students across the government and private nursing institutes reported high levels of anxiety. Although nursing students are following all the necessary protective behaviors, there is an enhanced need to focus on reinforcement sessions.

Limitations

The results of the present study must be interpreted considering its limitations. The results may not be generalized at a larger scale as the study was conducted at nursing institutes of a single city of Rajasthan, India.

Conflicts of interest

There are no conflicts of interest.

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