

An Online Survey to Assess Knowledge and Preventive Practices of Indian Nursing Students towards Covid-19

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Abstract

The novel Coronavirus disease (Covid-19) remains a significant public health challenge across the world. Research on nursing students' awareness of Covid-19 is limited in India. The present study aimed to assess nursing students' knowledge and preventive practices towards Covid-19. This online cross-sectional descriptive survey among nursing students (n=332) at two universities from South India, data was collected using a structured questionnaire. Most of the nursing students had more knowledge in clinical presentation (M±SD, 8.07±1.53) and prevention and control (M±SD, 3.67±0.81) domains than in transmission routes (M±SD, 1.24± 0.65). However, a majority (72%) of students had good knowledge (M±SD 12.97±2.38) and possessed preventive practices against Covid-19 (89.6%, M±SD 34.96±2.89). The results also showed that there were significant differences (p<0.05) in several demographic variables (perceived knowledge, age, gender, year of education) with the knowledge and preventive practices of students. To conclude, most nursing students had adequate knowledge and good practices towards Covid-19. Yet, a gap in the knowledge on transmission of coronavirus, and maintaining hand hygiene requires careful attention. It is critical to update students' knowledge on Covid-19 and current prevention and control protocols through online educational programmes.

The novel Coronavirus disease (Covid-19) remains a significant public health challenge across the world. The first case of Covid-19 in India was reported on 30 January 2020. The battle against Covid-19 is still continuing in India and around the world. As of 1 June 2021, the Ministry of Health and Family Welfare (MoHFW), Government of India confirmed 2,81,75,044 Coronavirus cases, 25,947,629 (92.09%) recoveries and 3,31,895 (1.18%) deaths in the country (MoHFW, 2021).

The World Health Organisation (WHO) is playing a significant role in creating awareness on Covid-19 among healthcare workers and others. In India, the MoHFW educates the public on Covid-19 by using different communication channels and mobile apps such as Aarogya Setu. Nurses being front line health care workers, play a critical role in protecting the community during the Covid-19 pandemic. Additionally, the WHO supported nurses and midwives by announcing the theme for World Health

Day 2020 as the "Year of the Nurse and Midwife".

Review of Literature

A recent comparative study among nursing students showed that almost all the students (97.7%) have a positive attitude to work for the country if required during the Covid-19 outbreak (Das & Bared, 2020). An online survey among Indian nursing students (n=213) found that 56.8 percent of them had adequate knowledge on Covid-19 infection (Abirami et al, 2021). On the contrary, few studies have reported poor level of knowledge among nursing students (Mundakir et al, 2020; Nwamaka & Chibuogwu 2020). A systematic review reported a need to ensure that students have adequate education in infection prevention and control and the necessary skills to provide care to infected patients during a pandemic (Gonifuste et al, 2021). Also, poor knowledge in nursing students can lead to poor perceptions and delay in handling during a pandemic (Patidar et al, 2021).

Need for the study

In India, the ongoing second wave of the coronavirus pandemic has placed overwhelming demands on health systems. Therefore, the Indian government has decided to rope medical and nursing stu-

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dents for Covid-19 duties under the supervision of their faculty (PMINDIA, 2021). However, adequate knowledge and appropriate practices about Covid-19 among healthcare professionals are necessary to protect themselves and for successful disease control and prevention (Gan et al, 2020). At this critical period, it is crucial to investigate the level of nursing students' awareness of Covid-19 as knowledge influences their preventive practices towards the disease.

Objectives

The main objective of the study was to assess nursing students' knowledge and preventive practices to be adopted towards Covid 19.

Materials and Methods

This cross-sectional descriptive online survey was carried out during May 2021 among nursing students at two universities in South India. The sample was selected conveniently. The data was collected using a structured online questionnaire developed using Google Forms. The questionnaire link was sent via WhatsApp to the student groups. The introductory part of this Google form included brief background, aim, objectives, procedures, voluntary nature of participation, and declarations of anonymity and confidentiality. The volunteered students were instructed to complete the questionnaire by clicking the link. A completed survey was automatically registered online. A total of 332 student nurses responded to the Questionnaire.

The survey instrument had three parts. Part 1 and part 2; it was a modified version of the questionnaire developed by Zhong et al (2020). The first part of the questionnaire included 10 items to collect the participants' background information and their perceptions toward Covid-19. This part included age, gender, university, year of nursing education, awareness of the novel coronavirus second wave in the country, awareness of infected persons in their immediate society, perceived knowledge of Covid-19, perceived knowledge on the prevention and control of Covid-19, sources of Covid-19 information, whether they learned about Covid-19 in the nursing courses and activities and family members working in hospitals.

Part 2 included 18 items to assess participants' knowledge on Covid-19 in three domains: clinical presentation (10 items), transmission route (3 items), and prevention and control (5 items). The items were answered with Yes, No, or Don't know response options. Correct responses were scored as 1, whereas incorrect answers or "Don't know" answers were scored as 0. We added the correct answers to determine the knowledge of the students. The scale measured knowledge of, maximum 18 to

minimum 0.

Part 3 included statements about prevention practices for Covid-19 developed by Albaqawi et al (2020) based on Centre for Disease Control and Prevention (CDC) guidelines. This scale consisted of 13 items with 'Always' (3), 'Some times' (2), and 'Never' (1) responses. The range of scores for this scale includes 13-39. A higher score reflects good practice practices to prevent Covid-19. The English version of the questionnaire was piloted among 30 students, and found feasible.

Ethical considerations

The research proposal was approved by the Nursing Research and Ethical Committee at the College of Nursing. The researchers also obtained formal permission from the concerned authority for data collection. The students were informed that participation or non-participation in this survey would not affect their academics in any way. Online consent was taken from the participants. The participants were requested to click on the Google link consent page after reading and marking on their agreement to complete the questionnaire including demographic details, knowledge and preventive practices to Covid-19.

Statistical Analysis

The data were analysed using appropriate statistical software (SPSS 21 version) and the results were presented in tabular form. Descriptive statistics such as frequency, percentage, mean and standard deviation were performed. Inferential statistics (independent t-test, one-way analysis of variance) were used to examine the relationship between socio demographic variables and participants' knowledge and preventive practices related to Covid-19. The level of significance was fixed at 0.05 levels.

Results

A total of 332 nursing students participated in this online survey. Most of the participants were females (92.8%) with a mean age of 20 years (SD, 1.19). While a majority (80.5%) of the students exposed to clinical areas (second, third and fourth years), 19.5 percent never had a clinical posting (first year). Almost all the participants were aware of the coronavirus outbreak, and 76.8 percent of them knew Covid-19 infected people in their community. Most of the participants agreed that social media (31%) was the primary source of information on Covid-19, followed by newspapers (16%) and television (15%). The participants' mean perceived knowledge on Covid-19 was 7.62 (SD,1.60), and prevention was 6.47 (SD,1.31) on a scale of 0-10. The baseline characteristics of nursing students are presented in Table 1.

Table 2 reports the participants' correct re-

Table 1: Characteristics of the participants (N=332)

S.No	Variable	Group	Frequency	Percentage
1	Age (years)	< 20	180	54.2
		> 21	152	45.8
2	Gender	Male	24	7.2
		Female	308	92.8
3	Education	First year	65	19.5
		Second year	77	23.2
		Third year	50	15.1
		Fourth year	140	42.2
4	Awareness of the novel coronavirus outbreak	Yes	327	98.5
		No	05	1,5
5	Know people in their community infected with Covid-19	Yes, confirmed	255	76.8
		Yes, but not yet confirmed	47	14.2
		No	30	9.0
6	Primary source of Covid-19 information	Television	117	15.0
		Social media	247	31.0
		Friends	96	12.0
		Newspapers	132	16
		Relatives working in the medical field	102	13
		University	104	13
7	Learned about Covid-19 in nursing courses	Yes	193	58.1
		No	139	41.9
8	Family member working in a healthcare facility	Yes	183	55.1
		No	149	44.9
Mean (SD)			Range	
1	Perceived knowledge on Covid-19		7.62 (1.60)	0-10
2	Perceived knowledge on Covid-19 prevention		6.47 (1.31)	0-10

sponses to the knowledge questionnaire. The highest percentage of correct answers recorded to the statement on India's daily positivity rate related to Covid-19 was a serious concern and isolating someone exposed to Covid-19 for 14 days (97.6%), followed by isolation and treatment of Covid-19 infected people are effective ways to reduce the spread of the virus (96.4%), the main clinical symptoms of Covid-19 are fever, fatigue, dry cough, shortness of breath, diarrhoea, and myalgia (96.1%) and oxygen requirement is higher in the second wave of Covid-19 infection (95.5%). The least percentage of correct responses was related to the statement on whether residents can wear general medical masks to prevent the infection by the Covid-19 virus (59.9%). Most of the nursing students responded correctly to the statements on clinical presentation ($M \pm SD$, 8.07 ± 1.53) and prevention and control ($M \pm SD$, 3.67 ± 0.81) subscales, whereas the lowest mean scores reported on transmission routes ($M \pm SD$, 1.24 ± 0.65). However, the total mean knowledge score ($M \pm SD$, 12.97 ± 2.38) indicates that 72 percent of the participants had adequate knowledge of Covid-19.

Majority of the participants endorsed that they

always clean and disinfect frequently touched surfaces daily (91.9%), throw used tissues in the trash (90.1%), wear a facemask (90.1%), avoid touching eyes, nose and mouth with unwashed hands (87.7%), follow the government rules & regulations during this Covid-19 outbreak (83.7%) and wash hands with soap and water for at least 20 seconds after blowing nose, coughing, or sneezing (79.2%). However, most participants agreed that they do not always wash hands with soap and water for at least 20 seconds after being in a public place (65.7%). The mean score on the preventive practices scale ($M \pm SD$, 34.96 ± 2.89) suggests that 89.6 percent of the nursing students possessed preventive practices against Covid-19 infection (Table 3).

Pearson's correlations revealed a positive correlation between participants' actual knowledge of Covid-19 with perceived knowledge ($r=0.22$, $p<0.001$) and preventive practices related to Covid-19 ($r=0.16$, $p<0.003$). One-way ANOVA showed significant differences in Covid-19 knowledge in terms of year of

education ($F=8.61$, $p<0.001$). On analysis of independent t-test, a significant difference observed between gender and knowledge on Covid-19 ($t=2.02$, $p<0.04$) as male participants scored higher than females. Similarly, sociodemographic variables such as students' age ($t=-2.16$, $p<0.03$) and year of education ($F=5.67$, $p=0.001$) significantly differed in preventive practices of Covid-19.

Discussion

The present study showed that most students had adequate knowledge (72%) and followed preventive practices (89.6%) against Covid-19 disease. Further, perceived knowledge on Covid-19 and its prevention practices significantly differed with age, year of education and gender of the participants.

Social media usage increased in the Covid-19 pandemic phase. Unsurprisingly, most of the nursing students in the present study gathered Covid-19 related information primarily through social media. This finding is similar to earlier studies that reported social media was the main source of Covid-19 information for health care workers (Albaqawi et al,

Table 2: Participants' knowledge on Covid-19 (N=332)

Items	Correct answers		Mean (SD)
	Frequency	Percentage	
Clinical presentations (10 items)			
1. The main clinical symptoms of Covid-19 are fever, fatigue, dry cough, shortness of breath, diarrhoea, and myalgia.	319	96.1	8.07 (1.53)
2. Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the Covid-19 virus.	212	63.8	
3. There currently is no effective cure for Covid-19, but early symptomatic and supportive treatment can help most patients recover from the infection.	309	93.1	
4. Not all persons with Covid-19 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases.	253	76.2	
5. India's daily positivity rate is a serious concern.	324	97.6	
6. More young people getting infected in second Covid-19 wave.	288	86.7	
7. Most of the people infected with second Covid-19 wave are asymptomatic.	268	80.7	
8. Most of people admitted in Covid-19 infection showed breathlessness while patients with a sore throat and dry cough were higher in the first wave.	298	89.8	
9. Oxygen requirement is higher in second wave Covid-19 infection.	317	95.5	
10. There is no difference in death rate in first and second wave of Covid-19 infection.	218	65.7	
Transmission route (three items)			
1. Eating or contacting wild animals result in the infection by the Covid-19	211	63.6	1.24 (0.65)
2. Persons with Covid -2019 cannot infect the virus to others when a fever is not present.	232	69.9	
3. The Covid-19 virus spreads via respiratory droplets of infected individuals.	313	94.3	
Prevention and control (five items)			
1. Ordinary residents can wear general medical masks to prevent the infection by the Covid-19 virus.	199	59.9	3.67 (0.81)
2. It is not necessary for children and young adults to take measures to prevent the infection by Covid-19	264	79.5	
3. To prevent the infection by Covid-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportation.	318	95.8	
4. Isolation and treatment of people who are infected with the Covid-19 virus are effective ways to reduce the spread of the virus.	320	96.4	
5. People who have contact with someone infected with the Covid-19 virus should be immediately isolated in a proper place.	324	97.6	
Total mean knowledge Score			12.97 (2.38)

2020; Ogolodom et al, 2020). Through the effective use of social media, nursing students update themselves on Covid-19 infection and preventive measures recommended by national and international agencies.

In the present study, most of the nursing students (80%) had a satisfactory level of knowledge on the clinical presentation of Covid-19 and prevention and control (73%). These findings were somewhat similar to a recent study that reported that Oman nursing students possessed a good level of knowledge on clinical symptoms and transmission routes. However, unlike the present study's findings, Oman

students had a lower level of knowledge on preventive aspects of Covid-19 disease (Salman et al, 2020). Similar to our findings, earlier researches also showed that nursing students had a lower level of knowledge on transmission of Covid-19 (Alshdefat et al, 2021; Adb Hasan, 2021; Modi et al, 2020). In this study, most (72%) of the nursing students had adequate knowledge of Covid-19. However, we were expecting a higher level of knowledge among our participants as the data was collected in April 2021 where India is experiencing the second wave of Corona pandemic. Therefore, our participants might have better information about the coronavi-

Table 3: Participants' responses to preventive practice questionnaire (N=332)

Items	Never n (%)	Sometimes n (%)	Always n (%)	Mean (SD)
1. I wash my hands with soap and water for at least 20 seconds after I have been in a public place.	91 (27.4)	218 (65.7)	23 (6.9)	1.79 (0.55)
2. I wash my hands with soap and water for at least 20 second after blowing my nose, coughing, or sneezing.	03 (0.9)	66 (19.9)	263 (79.2)	2.78 (0.43)
3. If soap and water are not readily available, I use a hand sanitizer that contains at least 60% alcohol.	11 (3.3)	117 (35.2)	204 (61.4)	2.58 (0.56)
4. I avoid touching my eyes, nose and mouth with unwashed hands.	02 (0.6)	39 (11.7)	291 (87.7)	2.87 (0.35)
5. I avoid close contact with people who are sick.	02 (0.6)	99 (29.8)	231 (69.6)	2.68 (0.47)
6. I put distance between myself and other people.	04 (1.2)	86 (25.9)	242 (72.9)	2.72 (0.52)
7. I stay at home if I'm sick, except to get medical care.	05 (1.5)	117 (35.2)	210 (63.3)	2.62 (0.52)
8. I cover my mouth and nose with a tissue when I cough or sneeze or use the inside of my elbow.	14 (4.2)	70 (21.1)	248 (74.7)	2.70 (0.54)
9. I throw used tissues in the trash.	01 (0.3)	32 (9.6)	299 (90.1)	2.89 (0.31)
10. I wear facemask if I am sick.	10 (3.0)	23 (6.9)	299 (90.1)	2.87 (0.42)
11. I clean and disinfect frequently touched surfaces daily.	03 (0.9)	24 (7.2)	305 (91.9)	2.90 (0.32)
12. I clean surfaces that are dirty.	05 (1.5)	93 (28.0)	234 (70.5)	2.69 (0.49)
13. I follow the rules implemented by the government during this Covid-19 outbreak.	02 (0.6)	52 (15.7)	278 (83.7)	2.83 (0.39)
Total practice score				34.96 (2.89)

rus disease. Also, a significant association between the level of knowledge and year of education of our participants supports this speculation.

Similar to an earlier study (Albaqawi et al, 2020), our study also found a positive correlation between participants' perceived knowledge on Covid-19 and actual knowledge scores ($r=0.22$, $p<0.001$). Also, senior students' mean knowledge score was higher than other students and previous corroborating research. The possible explanation for these findings could be that senior students are engaged for eight hours in clinical areas in tertiary hospitals. In our study, male participants had a better level of knowledge on Covid-19 as they scored higher than females ($t=2.02$, $p<0.04$). These findings were dissimilar to a multicentre study from Saudi Arabia, which reported a higher knowledge score on Covid-19 among female participants than male participants. These findings could be attributed to the fact that the sample in our study comprised more female participants (92.8%). However, further studies are required to support it.

Majority of students in this study demonstrated good preventive practices such as cleaning and disinfecting frequently touched surfaces daily (91.9%), throwing used tissues in the trash (90.1%), wearing a facemask (90.1%), avoiding touching eyes, nose and mouth with unwashed hands (87.7%), following the government rules government during this

Covid-19 outbreak (83.7%) and wash hands with soap and water for at least 20 seconds after blowing my nose, coughing, or sneezing (79.2%). However, proper hand hygiene was observed only among 6.9 percent of the students. These findings were in line with an earlier study which reported that only 47.4 percent of nursing students frequently washed their hands (Ranjan & Das, 2020). However, this finding is alarming as washing hands with soap and water for at least 20 seconds after being in a public place is critical to prevent spread of Covid-19 infection effectively. Though they use hand sanitiser, they need to be educated about the importance of hand washing. Also, documented literature showed that hand hygiene is one of the most important measures to prevent and control infectious disease, including Covid-19 (Cheng et al, 2020). Nonetheless, a majority (89.6%) of the nursing students in this study possessed good preventive practices toward the Covid-19. These findings were in support of earlier research carried out among nursing students (Alshdefalt et al, 2021; Ranjan & Das, 2020). The predictors of good preventive practices in this study include students aged above 21 years ($t=-2.16$, $p<0.03$), senior students ($F=5.67$, $p=0.001$) and perceived higher knowledge scores ($r=0.16$, $p<0.003$). These findings were similar to a recent study that reported having higher knowledge scores reflected good preventive practices among Oman nursing

students (Alshdefalt et al, 2021).

Limitations

This survey was limited to two universities and the students who only had internet access. The responses relied primarily on the participants' trustworthiness as they were accessible to online correct Covid-19 information resources. Hence, the generalisability of the findings was limited. The future studies should include a larger sample from different parts of the country.

Nursing Implications

The results of this study offer valuable insights into undergraduate nursing students' awareness and preventive practices towards Covid-19. The findings may have significant implications in developing appropriate evidence-based educational programmes to enhance nursing students' knowledge on novel coronavirus and to promote preventive behaviours.

Recommendations

The findings of this study strongly suggest to conduct webinars and online educational programmes to empower future nurses to update their knowledge and current prevention and control protocols on Covid-19.

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Conclusion

In summary, a majority of the nursing students have had a good level of knowledge and followed appropriate preventive practices during the swiftly rising second wave of the Corona. Yet, a gap in the knowledge on transmission of coronavirus needs to be filled up and hand hygiene should be maintained carefully.

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