Original Research

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Knowledge, Attitudes and Practices of Undergraduate Nursing Towards Novel Corona Virus (COVID 19)

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Abstract

Background: The recent emerging respiratory disease caused by the novel type of Coronavirus has been named as COVID-19. This respiratory illness has received international attention and it is categorized as a high-threat disease in the US by the Center for Disease Control and Prevention. The purpose of the study was to assess the knowledge, attitude and practice of undergraduate nursing students towards COVID-19.

Methods: Descriptive cross-sectional design was used to assess knowledge, practice and attitudes of 255 undergraduate nursing students towards COVID-19. Study participants were recruited from the nursing college to Fakeeh College for Medical Sciences, between April and July, 2020.

Results: The results of study participants showed that undergraduate nursing students had moderate knowledge of COVID-19. Also, participants had high level of knowledge regarding nature of diseases and precautionary measures by health care providers' dimensions however, they expressed limited knowledge towards modes of transmission. Moreover, study participants demonstrated an optimistic attitude toward disease and good practice towards COVID-19.

Conclusion: The study results revealed that the study's participants demonstrated good knowledge with favorable and accepted practice. This study suggests the importance of emphasis on infectious disease in the nursing curriculum.

Introduction

COVID-19 is an emerging respiratory disease caused by the novel type of Coronavirus. This respiratory illness has received international attention and it is categorized as a high-threat disease in the US by the Center for Disease Control and Prevention (CDC).[1] The first case of COVID-19 was diagnosed in Wuhan city, China in late December 2019. The World Health Organization (WHO) announced the disease as a pandemic in February, 2020. Around 62 countries reported 85176 confirmed cases with more than of 3000 death cases.[2] In the Kingdom of Saudi Arabia, the first case was conformed in March, 2020.

The exact method of transmission of the novel Coronavirus is not clear yet. However, there has been a hypothesis that it spreads through direct contact, air droplet, or animal transmission. Also, the virus has 14 days of incubation before the clinical symptoms of illness becomes apparent.[3,4] The symptoms are fever, cough, myalgia, shortness of breath, dyspnea, hypoxemia and respiratory distress.[5] Adults and children are reported to experience less severity of symptoms compared to people who are immunocompromised.[6] A treatment modality for affected individuals is quarantine and isolation in order to protect people who surround them, especially as there is no drug effective against the virus and the treatment is supportive. There is no approved antiviral drug or vaccine although great efforts have been shown from several pharmaceutical companies to discover such a vaccine.

Universities are likely to become explosive, infected, and epidemic epicenters due to their large number of young students, high levels of close social contact and permeable restrictions.[7] It is very important to assess the knowledge and attitudes of university students to the COVID-19 virus,[8] because this can give an idea about what information they have and their attitude towards this crisis.[9] Attitude as defined by Abdelrahman,[10] is something that "represents the positive or negative readiness towards certain things; a person, place, an event. Following the WHO declaration about a global pandemic, the government of Saudi Arabia has monitored the condition of the country's health closely, particularly after the first national case diagnosis confirmation on March 2, 2020. The Kingdom of Saudi Arabia implemented preventive measures to control the spread of COVID-19; these measures included a national curfew to restrict human movement for most of the day and lockdown of schools, universities, national, and international flights, as well as suspended visits for Umrah, and visiting the Prophet's Mosque. The assessment of KAP plays an integral role in identifying behavioral changes, acceptance, and identifying the required type of interventions to achieve the change. In addition, the novelty of the Coronavirus, along with

Table 1 Sociodemographic characteristics of participants

Characteristics	Frequency	Percentage
Age		
18-21	74	29.01
22-26	118	46.27
>26	63	24.7
Gender		
Male	0	0
Female	255	100
Education Level		
Second Year	86	33.72
Third Year	114	44.7
Fourth Year	55	21.56
Living with		
Family	186	72.94
Friend	24	9.41
Alone	45	17.64
Place of Living		
Rural	178	69.8
Urban	77	30.19

its uncertainties make it critical for assessing medical students' knowledge, attitudes and practice (KAP) towards COVID-19. The purpose of the study was to assess the knowledge, attitude and practice of undergraduate nursing students towards COVID-19.

Methods

Design and setting

The study employed describes a cross-sectional survey. All undergraduate nursing students, as well as the nursing interns, who were enrolled in King Abdulaziz University (KAU) in Jeddah and satisfied the inclusion criteria were included in the study, as follows:

(1) The participants must be enrolled in the undergraduate nursing program in KAU.
(2) Able to read and write English language.

Sample size and sampling technique

Based on Cohen's sample power calculation on the minimum required sample size for observational study,[11] with the desired probability of (0.05), and small effect size of (0.05), and the statistical power level of (0.8), the required sample size is 255.

Data collection procedure

The study used several strategies to enhance the response rate of nursing students. The survey was administered online by Survey Monkey forms, Google forms, Facebook, Twitter, and WhatsApp. The research team sent several reminders to encourage all students to complete the survey. The data collection took place between April and July, 2020.

Outcome measures

The outcome measures of the study included 2 parts, the first part was related to the socio-demographic data of the study participants such as age, gender, education level, and marital status. The second part of the scale was a COVID-19 knowledge questionnaire which

was developed by Hassan.[12] It had 5 dimensions which included 7 questions about the nature of the disease, 5 questions concerned the mode of transmission, 13 questions related to action(s) taken to handle suspected or confirmed cases, 4 questions related to precautionary measures by health care providers, and 4 questions related to the treatment of the disease. Each question was answered on a true/false basis with an additional 'I don't know' option. The potential knowledge score ranged from 0 to 33; higher scores indicated better knowledge towards COVID-19. The internal consistency of knowledge items was 0.83. Attitudes towards COVID-19 were measured by 11 questions rated on 5 Likert scales: "Strongly agree to Strongly disagree." Scores ranged from 11 to 55, with high scores indicating positive attitudes. The Cronbach alpha OD attitude subscale was 0.8 Also, the participants' practice towards COVID-19 was assessed by 5 questions rated on a 5-point Likert scale: "Strongly agree to Strongly disagree." Overall score ranged from 5 to 25, with high scores indicating better practices. The internal consistency of practice items was 0.83.

Data analysis

Data were analyzed using the Statistical Program (SPSS) version 24 (IBM Inc., Armonk, NY, USA). The research student coded data appropriately and entered it into the software. Data satisfied statistical assumptions such as normality, linearity, and homogeneity of variance. Descriptive statistics was used to report frequency and percentage, as well as mean alongside standard deviation. Moreover, inferential tests such as independent sample t-test and 1-way analysis of variance were used to compare the differences in study outcomes in relation to sociodemographic data. Pearson correlation test was used to examine the relationship between study outcomes and study participants' characteristics. $P < 0.05$ was considered as statistically significant.

Results

A total of 255 undergraduate nursing students completed the survey questionnaire. Of these, a third of the study participants were between 18 - 21 years old and 100% of study participants were females; 33.72% of students were in their second year in nursing college compared to 21.56% who were in their fourth year. Moreover, almost 2-thirds of study participants resided with their family in the same home in rural areas (70%). Socio-demographic characteristics are shown in Table 1.

A total of 32 questions were used to measure knowledge on the COVID-19 virus. The first dimension has 7 questions, the average of study participants' knowledge regarding the nature of disease showed that they had moderate level of knowledge regarding the nature of diseases. In the present study, the second dimension was measured by 5 questions and the average revealed that they had limited knowledge about the transmission of disease (average 2.14 ± 1.01). Furthermore, dimension 3 was measured by 13 questions in the used scale: the average reflected that study participants had moderate level of knowledge about appropriate intervention to deal with suspected or confirmed cases with COVID-19 (average 8.65 ± 2.27). Additionally, study participants had adequate knowledge about the precaution measures to control COVID-19 spread in the community. However, the results of the survey indicated that study participants expressed moderate level of knowledge towards treatment of COVID-19 cases. Overall, average knowledge scores of participants were 20.54. This reflects limited level of knowledge about the pandemic disease, as described in Table 2.

Table 2 Overall knowledge scores and its dimensions of study participants

Subscale	Potential Range of Scores	Mean	Standard Deviation
Dimension 1: Nature of Disease	*0-7*	*4.60*	*1.86*
Dimension 2: Transmission of Disease	0-5	2.14	*1.01*
Dimension 3: Actions in Dealing with Suspected, Probable and Confirmed Cases	0-13	8.65	2.27
Dimension 4: Precautionary Measures by Health Care Providers	0-5	4.35	*1.14*
Dimension 5: Treatment of the Disease	0-5	3.01	1.16
Overall Knowledge Scale	0-33	20.54	4.67
Attitudes Scale	1-55	43.78	5.74
Practice score	1-25	18.67	3.45

Table 3 Study participants responses on knowledge scale about Coronavirus

Knowledge Questions	True	False	Don't Know
Dimension 1: Nature of Disease			
The symptoms of Corona Virus are fever with/without chilling, cough, and dyspnea	173 (67.8%)	66 (25.8%)	16 (6.2%)
Recommended diagnostic approach in human is sampling of upper and lower airways secretions and PCR (polymerase chain reaction) examination	174 (68.2%)	47 (18.4%)	34 (13.3%)
The causative agent of corona infection is coronavirus	203 (79.6%)	18 (7.0%)	34 (13.3%)
Corona Virus can be eliminated with 70% alcohol	168 (65.8%)	82 (32.1)	5 (1.9%)
Corona Virus can be prevented with the injection of a vaccine	194 (76.0%)	37 (14.5%)	24 (9.4%)
The incubation period of CoV is 2–14 days	187 (73.3%)	7 (2.7%)	61 (23.9%)
The corona virus can survive for 48 h in the environment	90 (35.2%)	111 (43.5%)	54 (21.1%)
Dimension 2: Transmission of Disease			
Corona virus is transmitted through direct contact with respiratory tract secretions	167 (65.4%)	83 (32.5%)	5 (1.9%)
The disease can be transmitted through direct contact with contaminated human's secretions, including urine, saliva, respiratory secretions, and blood	51 (20.0%)	176 (69.0%)	28 (10.9%)
Corona virus is transmissible through hemodialysis	46 (18.0%)	162 (63.5%)	47 (18.4%)
Corona Virus is probably transmissible from infected diseased patients	111 (43.5%)	127 (49.8%)	17 (6.6%)
The disease can be transmitted from asymptomatic patients or those who are in the latent period of the disease	97 (38.0%)	139 (54.5%)	19 (7.4%)
Dimension 3: Actions in Dealing with Suspected, Probable and Confirmed Cases			
The use of personal protective equipment is necessary during aerosol production procedures, such as suction sputum sampling and intubation	182 (71.3%)	49 (19.2%)	24 (9.4%)
It is advisable to sample all respiratory secretions from all patients admitted to the hospital with a primary diagnosis of pneumonia and suspicion of CoV infection	164 (64.3%)	47 (18.4%)	44 (17.2%)
Suspected and probable cases of CoV infection must be reported immediately to the infectious disease control center	179 (70.1%)	38 (14.9%)	38 (14.9%)
A complete list should be provided of all people who have been in contact with the confirmed patient with CoV infection	183 (71.7%)	39 (15.2%)	33 (12.9%)
The use of N95 masks is necessary when sampling of induced sputum from patients suspected of CoV infection	181 (70.9%)	43 (16.8%)	31 (12.1%)
Visitors to patients with suspected, probable and confirmed cases of CoV infection should be limited both in hospital and at home	172 (67.4%)	68 (25.6)	15 (5.8%)
The number of caregiving personnel for suspected, probable and confirmed cases of CoV infection, including physicians and nurses, should be limited and certain.	148 (58.0%)	76 (29.8%)	33 (12.1%)
If no isolation room is available, patients with a diagnosis of CoV infection can be put in the same room with beds 1 m apart	169 (66.2%)	59 (23.1%)	27 (10.5%)
After confirming the diagnosis of CoV infection, patient's contacts in the past 14 days must be checked and controlled	179 (70.1%)	68 (25.6)	8 (3.1%)
After diagnosis of CoV infection, it is necessary to find possible patients among those who have been in contact with the patient	177 (69.4%)	57 (22.3%)	21 (8.2%)
The N95 mask is required to be put on when entering the room of a patient with CoV infection and caring at a distance of 2 m from the patient	158 (61.9%)	75 (29.4%)	22 (8.6%)
A person with mild symptoms of CoV must remain at home until resolution of clinical symptoms and negative results of the PCR test	178 (69.8%)	48 (18.8%)	29 (11.3%)
Patients with CoV infection admitted to an isolation room should use a surgical mask when moving and leaving the room for diagnostic and therapeutic procedure	159 (62.3%)	76 (29.8%)	20 (7.8%)

(Continued)

Table 3 (Continued)

Knowledge Questions	True	False	Don't Know
Dimension 4: Precautionary Measures by Health Care Providers			
Droplet precautions should be followed by health care providers in dealing with suspected, probable and confirmed cases of CoV infection	197 (77.2%)	51 (20.0%)	7 (2.7%)
Contact precautions should be followed by health care providers in dealing with suspected, probable and confirmed cases of CoV infection	193 (75.6%)	28 (10.9%)	34 (13.3%)
Standard precautions should be followed by health care providers in dealing with suspected, probable and confirmed cases of CoV infection	187 (73.3%)	38 (14.9%)	30 (11.7%)
Airborne precautions should be followed by health care providers in dealing with suspected, probable and confirmed cases of CoV infection	224 (87.8%)	18 (7.00%)	13 (5.0%)
Dimension 5: Treatment of the Disease			
Oxygen therapy should be given to all cases of severe CoV with acute respiratory infection	161 (63.1%)	72 (28.2%)	22 (8.6%)
Antibiotic therapy is required for the treatment until of pneumonia of suspected cases of CoV infection	136 (53.3%)	105 (41.7%)	14 (5.4%)
Ventilation with an endotracheal tube must be carried out in patients with confirmed or suspected CoV with clinical manifestations of acute respiratory distress syndrome	137 (53.7%)	91 (35.6%)	27 (10.5%)
High doses of systemic corticosteroids should be avoided in patients with confirmed or suspected CoV infection and clinical manifestations of viral pneumonia	82 (32.1%)	142 (55.6%)	31 (12.1%)

The number and percentage of true, false and 'I don't know' answers of study participants regarding the knowledge dimensions are shown in Table 3. As it can be seen, a higher percentage of correct answers were noted under the nature of the disease and precautionary measures by health care providers. Additionally, the study participants' responses revealed that they had moderate level of knowledge regarding the actions in dealing with suspected, probable and confirmed cases. However, the lowest percentages were observed in transmission and treatment of disease. Notably, the study was conducted before vaccines became widely used or the virus' variants spread.

The results of study participants regarding attitudes towards COVID-19 revealed that they had negative attitudes. For instance, only 27% of study participants agreed to work in a place with patients confirmed with COVID-19, in addition, the majority of students (67.2%) expressed that they were hesitant to care for such patients. Around 50% of participants believed disease transmission could be controlled by using protective measures, and more than 52.8% of study participants were in agreement of COVID-19 being a highly transmissible disease. Moreover, 50% of participants also agreed that COVID-19 would be successfully controlled by locking down crowded places such as schools. However, the remaining 50% of participants were unsure whether the virus could be controlled by lockdown measures. Only 9.7% of participants believed that health education was an effective measure to prevent the occurrence of COVID -19 and 47% were convinced that COVID-19 was a dangerous disease (see Table 4).

There was a total of 4 questions to assess practice among the participants Also, most of them expressed unfavorable practices when they were asked about the efforts of different authorities for disease prevention and control; wherein 33.4% agreed that responsible authorities take the necessary measures for disease control, 55.9% agreed that Coronavirus has a deleterious impact on the economic status of the affected country. Among participants, 55.2% believed that COVID-19 is a preventable disease. Meanwhile, 45% of participants performed practices like wearing a mask is a correct way to control disease transmission while majority of the participants were certain that a reported case

discovered to the health authority was a successful method of restricting disease spread (Table 5).

Discussion

To the best of our knowledge, there are no previous studies examining KAP among undergraduate nursing university students toward COVID-19. However, there are limited studies examining general community perception towards the pandemic.

It has been reported that the KAP for an infectious disease relies on several factors such as the prevalence and incidence of cases as well as mortality rate of affected people. Ever since the announcement of COVID-19 as a pandemic by the WHO, the knowledge, attitude, and practices toward COVID-19 has been growing day by day.[13,14] The fact that COVID-19 is a highly contagious disease makes the control of its spread a challenge, therefore, the effective strategy to control the spread of infectious diseases is by adopting strict sanitation measures as well as proper measures of handwashing. The Ministry of Health in Saudi Arabia implemented strict safety measures, for instance, wearing facemasks and gloves, and frequent handwashing.

The results of the study indicated that nursing students had moderate level of knowledge towards COVID-19 (average 20.54 ± 4.67). Looking at the table results reflected that some knowledge items towards COVID-19 were received by a high percentage compared to other items which were received by a low percentage. This suggests a higher number of participants had more knowledge and the other part (lower part) had less knowledge about the phenomenon. The finding of a higher rate of COVID-19 knowledge found among study participants can be related to the nature of their discipline (Nursing) even though the study was conducted at an earlier stage of the pandemic crisis. Also, the largest proportion of study sample was at an advanced education level, those students were more likely to actively learn information about the virus from a variety of authentic sources.

Regarding the nature of disease dimension, students appeared to have sufficient knowledge about the disease as most of them provided correct answers to questions related to symptoms, diagnostic

Table 4 Participant's attitude about Coronavirus infection

Attitude Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I am afraid of working in places where patients suspected of CoV infection are admitted/cared for are admitted/cared for	31 (12.1%)	38 (14.9%)	82 (32.1%)	66 (25.8%)	38 (14.9%)
I am afraid of caring for a patient with CoV infection	40 (15.6%)	43 (16.8%)	67 (26.2%)	65 (25.4%)	40 (15.6%)
Despite the use of personal protective equipment and observing infection transmission the risk of CoV infection is high among health care staff	88 (34.5%)	52 (20.3%)	46 (18.0%)	28 (10.9%)	41 (16.0%)
I think that the equipment and facilities required to protect health care workers from CoV have not been sufficiently provided in the care settings	30 (11.7%)	35 (13.7%)	75 (29.4%)	64 (25.0%)	51 (20%)
Higher pay should be received when caring for patients with CoV infection	76 (29.8%)	44 (17.2%)	52 (20.3%)	43 (16.8%)	40 (15.6%)
I am afraid that a family member of mine may be affected by CoV infection	88 (34.5%)	27 (10.5%)	58 (22.7%)	46 (18.0%)	36 (14.1%)
In case of CoV outbreak, schools and workplaces should be closed	157 (61.7%)	32 (12.5%)	38 (14.9%)	20 (7.8%)	8 (3.1%)
Corona Virus is highly transmissible in hospital	78 (30.5%)	57 (22.3%)	62 (24.3%)	34 (13.3%)	24 (9.4%)
Health education has no effect on the prevention of CoV infection	10 (3.9%)	15 (5.8%)	63 (25.3%)	59 (23.1%)	108 (42.3%)
I think that training on CoV is effective in protecting me from the disease in case of likely exposure	71 (27.8%)	47 (18.7%)	54 (21.7%)	39 (15.2%)	44 (17.2%)
Caring for patients with CoV infection may be a threat to health care personnel	63 (24.7%)	61 (23.9%)	65 (25.7%)	38 (14.9%)	28 (11.3%)

Table 5 Participant's practice about Coronavirus infection

Practice Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Public health agencies can control Outbreak of CoV	31 (12.1%)	57 (22.3%)	84 (32.9%)	37 (13.6%)	46 (18.0%)
Corona Virus can have a negative effect on the economies of the countries involved	89 (34.9%)	51 (20.0%)	34 (13.3%)	35 (13.8%)	31 (12.2%)
It is important to report suspected cases to health authorities	102 (40.0%)	41 (16.0%)	53 (20.8%)	34 (13.3%)	21 (8.2%)
Corona Virus is preventable	59 (23.1%)	55 (22.1%)	86 (33.7%)	38 (14.9%)	28 (10.9%)
It is imperative to use a surgical mask when working with the patient with Co V	88 (34.5%)	27 (10.5%)	55 (22.1%)	35 (13.7%)	46 (18.0%)

criteria, and techniques as well as virus incubation period. In this study, the findings regarding the knowledge about COVID-19 among the students reflect a good relationship between their deep understanding and the information available about COVID-19 in literature and the media.[13,15] For example, most of the study participants defined frequent clinical manifestation of the disease (i.e., fever, dry cough, and dyspnea) and lack of effective approved treatment against COVID-19. This could be attributed to the seriousness of the COVID-19 disease, the number of new cases, as well as the mortality rate announced daily by the World Health Organization. This result is consistent with those reported elsewhere that students had adequate knowledge towards symptoms and preventive measures.[16,17] This could be explained by the fact that the Ministry of Health in Saudi Arabia conducted an official talk daily where the Health Minister and MoH used specified education channels to inform the public about the COVID-19 virus. Moreover, several reports are made available from the World Health organization and Center for Disease Control and Prevention.

With regard to the mode of transmission, the study participants demonstrated poor knowledge towards the recent transmission of the Coronavirus, this was evident from the average (2.14 ± 1.01). The percentage of correct answers was low when compared to that of non-correct answers, this could be explained by the novelty of the virus and several inconsistent information about the method of transmission by close contact (65%), air droplet (20%), or through haemo-dialysis (18%). Comparison of the findings with those of other studies confirms that students showed limited knowledge about COVID-19 mode of transmission.[12,18] It could be attributed to the spread of myths and misinformation driven by fear, blame and stigma. This may be a reflection of need to have more emphasis on the modes of transmission in the future educational campaign.

In terms of actions in dealing with suspected, probable and confirmed cases, the results of survey showed that participants reported the importance of social distance, and the importance of using surgical masks in prevention of disease spread. Similarly, the result of Al-Hanawi and Angawi[18] showed that students of KAU showed a good knowledge towards the importance of frequent handwashing, mask and social distance in controlling the COVID-19 spread. The current study confirmed the fact that students of health colleges are more knowledgeable compared to other specialties and this result is in accordance with the documentation.[19] In relation to public knowledge, general population stresses the importance of mask in prevention of disease spread.[20,21] Several studies conducted in other Asian countries have indicated high levels of COVID-19 knowledge among the general population and healthcare workers.[17,22] Differences in measurement and scoring systems do not make it possible for accurate comparisons of knowledge levels across these studies.

Also, study participants had moderate knowledge about the appropriate treatment approach for COVID-19. The participants indicated oxygen, antibiotics, antivirals, or vaccination as management actions. This could be attributed to the fact that there are no approved drugs or vaccines against COVID-19.[14] This also accords

with our earlier observations, which showed that participants expressed a wide range of views towards COVID-19 management by drugs, traditional treatment or vaccination.[15,16,18]

In terms of student attitude toward Coronavirus, the study showed that participants had optimistic attitudes towards the pandemic. Around 27% of study participants stated they were hesitant to provide care for patient diagnosed with COVID-19. Furthermore, 54% of students reported that even if they use face masks, the risk of COVID-19 was still high. The results showed that the most of students applied precautionary measures in order to control COVID-19 spread. These measures included avoiding crowded places or wearing medical masks. These were consistent with strict measures as were implemented by the government. Approximately 75% agreed that gathering places should be locked down to successfully control COVID-19 spread. This finding is consistent with a recent study conducted in China, where the majority of participants were convinced that the disease is curable and that their country will combat the disease.[17] However, these results contrast with other findings that suggest people tend to express negative emotions, such as anxiety and panic during a pandemic that could affect their attitude. In terms of practice, study participants showed good practice towards COVID-19. This is evident from their agreed responses. This result is supported by earlier studies which indicated that participants who had good knowledge of COVID-19 transferred it into practice.

It is worth noting that there was a significant difference in the mean of knowledge, attitudes, and practice scores according to the characteristics of study participants. For instance, students who were 22 years or older showed more knowledge, optimistic attitudes, and positive practice. In addition, educational level demonstrated significant difference in all dimensions of knowledge, attitudes and practice. This could be related to the fact that advanced students received more specialized nursing courses alongside epidemiology courses. This positive result was also echoed in students who lived in rural areas. This might be related to availability of information, strictness in application of governmental preventive measures. These results corroborate the findings of a great deal of the previous work in Alzoubi, Alnawaiseh,[23] and Hassan,[12] who stated that age and education level influenced participants knowledge, attitudes and practices towards COVID-19.

Despite its exploratory nature, this study offers some insight into assessing undergraduate nursing students' attitudes KAP towards COVID-19. However, the study had threats such as study participants being recruited from 1 government university which limits the generalizability of the study findings; moreover, almost all of the study participants were female.

Conclusion

Our findings suggest that undergraduate nursing students had good knowledge, positive attitudes, and good practices toward COVID-19. The results of the study should help stakeholders pay more emphasis to infectious disease and the nursing role in controlling its spread.

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