Original Article

Knowledge, attitude, and practices regarding COVID-19 among college-degree students in Southern district of India

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Abstract

Background and aims: A case of coronavirus disease 2019 (COVID-19) was identified first in Wuhan, China in December 2019. To prevent the rampant spread of COVID-19, the behavioral change of people was crucial. This study aimed to determine the knowledge, attitude, and practice (KAP) toward COVID-19 among college-degree students in the southern district of India.

Methods: A cross-sectional, online study was conducted from January to February 2021 among 400 college-degree students. Snowball sampling technique was adopted for collecting data using a semi-structured questionnaire. Data were entered in Excel and analyzed using Epi Info version 7.2.

Results: Out of 400 participants, 107 (26.75%) were male and 293 (73.25%) were female. Out of all the men in the study, 107 (100%) had good knowledge regarding COVID-19 infection, whereas 276 (94.2%) of women had good and 17 (5.8%) had average knowledge ($P<0.01$). A total of 262 (89.4%) and 31 (10.6%) women had a positive attitude and neutral attitude toward COVID-19 infection, respectively, whereas in men, the majority (86, 80.4%) had a positive, followed by (14, 13.1%) negative and (7, 6.5%) had neutral attitude ($P<0.001$). All the students 400 (100%) had good practice 400 (100%) regarding COVID-19 infection.

Conclusion: The male students had better knowledge about COVID-19 infection, but the positive attitude towards COVID-19 was higher among women. The practice regarding COVID-19 infection was satisfactory among all the students.

Keywords: Knowledge, Attitude, Practices, COVID-19

Introduction

Several cases of pneumonia of unknown etiology were reported on December 31, 2019, in Wuhan, Hubei province, China (1). On January 7, 2020, the causative agent for this unknown disease was identified as a new type of coronavirus (2). On January 30, 2020, the World Health Organization (WHO) declared this epidemic as a Public Health Emergency of International Concern (PHEIC) under International Health Regulation (2005) due to its erratic growth (3). On March 11, 2020, the WHO declared the COVID-19 outbreak a pandemic (4). On March 15, 2021, 119 603 761 cases have been confirmed globally, of which 11 385 339 were reported from India (5) (including 980 898 cases in Karnataka, with 8512 dead and 412 266 treated) (6).

To achieve a victory over COVID-19 in India, effective planning and implementation of preventive measures was essential. The government of India has released various guidelines to create awareness regarding COVID-19 infection to protect all citizens. In addition, prevention and containment of the disease are possible only with a change in the behaviors of the society.

India comprises a large younger population, and students are part of it. Students are a powerful source of change. Creating awareness can encourage students to become advocates for disease prevention at home and in their community by communicating with others about how to prevent the spread of coronavirus (7).

After the first lockdown in India, instructions were given to institutions and students to continue the temporarily banned offline education with severe preventive measures, such as (*a*) washing hands regularly with soap and water or cleaning them with an alcohol-based hand rub, (*b*) maintaining at least a 2-m distance between people coughing or sneezing, (*c*) avoiding touching the face, (*d*) covering the mouth and nose when coughing or sneezing with a tissue and discarding immediately, (*e*) staying in a home if unwell, (*f*) refraining from smoking and other activities that weaken the lungs, (*g*) practicing physical distancing by avoiding unnecessary travels, and (*h*) staying away from large groups of people (5).

Therefore, it was crucial to examine students' knowledge, attitude and practice (KAP) regarding COVID-19. Since only a few studies have been conducted in India to assess the KAP among college-degree students, the present study was conducted to assess the KAP of COVID-19 among college-degree students in the Southern district of India.

Methods

A cross-sectional, online study was conducted in 400 college-degree students in a southern district of India from January to February 2021 to study their KAP of COVID-19. The three science and commerce college-

degrees were randomly selected in the Kodagu district, and they were (*a*) Government Junior College, (*b*) Aided Field Marshal Cariappa College, and (*c*) Private Cauvery College-degree.

The college-degree students were chosen for the study due to

1. The colleges were about to reopen after the lift of the first lockdown, but the transmission of COVID-19 was still present.
2. The colleges consisted of different degree branches, and the number of students was high.
3. Because of the large number of students in the college, maintaining social distancing would be difficult, and a lack of knowledge about COVID-19 might lead to high transmission of infection and increase clusters of COVID-19.

The college heads were presented with the significance of the study. Permission from the heads was obtained to conduct the study. Due to social distancing measures and restricted movement and lockdowns, a few students volunteered to participate in the study. Google forms links with informed consent forms were shared to participate in the study after assuring confidentiality as mentioned in informed consent form. We employed a snowball sampling technique to potentially recruit more respondents from their college-degree friend's circle. The respondents were motivated to refer study links to their contacts for participation. The participants were auto-directed to the survey by clicking the link. Participation was voluntary, with no incentives.

Study tool

The questionnaire was created by reviewing the literature and similar studies published. The questionnaire was reviewed and evaluated by all the members of the research tram separately. The pre-validated and semi-structured questionnaire was used in the study (8-12). The pilot study was carried out, and the questionnaire was finalized.

The KAP questionnaire of COVID-19 had seven knowledge, seven attitude and eight practice items. The knowledge items were concerned with clinical presentations, transmission routes, prevention and control of COVID-19. These questions were answered on a true/false basis with an additional "I do not know" choice. A correct answer was assigned 1 point, and an incorrect/unknown answer was assigned 0. The total knowledge score ranged from 0 to 7, with a higher score denoting a higher knowledge of COVID-19. Attitudes towards COVID-19 were measured using a Likert scale (agree, undecided, disagree). A score of 1 was given to agree, 0 to undecided, and -1 to disagree. The total score ranged from -7 to 7, with a higher score denoting a more positive attitude towards COVID-19. The number of the practice items was eight and they were answered on a true/false basis. A correct answer was assigned 1 point, and an incorrect/unknown answer was assigned 0. The total practice score ranged from 0 to 8, with a higher score

denoting better practice toward COVID-19 (8,10,11,13).

Cronbach's alpha was used to assess the internal reliability of the questionnaire. The Cronbach's alpha coefficient of the knowledge subscale was 0.854, the attitude subscale was 0.437, and the practice subscale was 0.27.

Data were entered in Excel and analyzed using Epi Info ver7.2. The quantitative variables were presented in a median and inter-quartile range. Chi-square test was applied to investigate the association. To examine the difference between two independent groups, Mann-Whitney U test was used. The *P* value of < 0.05 was considered significance level.

Results

Sociodemographic details

This study was conducted among 400 students studying in science and commerce college-degrees (1st year to 3rd year). Out of 400 participants, 107 (26.75%) were male and 293 (73.25%) were female. The majority of the students were studying in 1st-year degree 164 (41.0%), followed by third year 129 (32.25%) and second year 107 (26.75%). A total of 345 (86.3%) students were pursuing BSc in various science subjects and remaining 55 (13.7%) were Bachelor of Commerce. A total of 265 (66.25%) respondents were from rural areas and 135 (33.75%) were from urban areas. Most (388, 97.0%) students were unmarried, and a few (12, 3.0%) of them were married (Table 1).

Knowledge regarding COVID-19 infection

Out of 400 participants, all the men (107, 100%) had good knowledge regarding COVID-19 infection whereas 276 (94.2%) women had good and 17 (5.8%) of them had average knowledge. The men had good knowledge score about COVID-19 infection compared to men, and the association between gender and knowledge score was statistically significant (*P* = 0.01). All the third-year (129,

Table 1. Sociodemographic distribution of participants based on gender (N = 400)

Variables	Number (N = 400)	Percent
Gender		
Males	107	26.7
Females	293	73.3
Education		
1st year degree	164	41.0
2nd year degree	107	26.7
3rd year degree	129	32.3
Field of study		
Science degree	345	86.3
Commerce degree	55	13.7
Residential locality		
Urban	136	33.7
Rural	264	66.2
Marital status		
Married	25	3.0
Unmarried	375	97.0

100%) and second-year (107, 100%) degree students had good knowledge scores regarding COVID-19 compared to first-year students, 147 (89.6%) had good knowledge, and 17 (10.4%) had average knowledge. The students of third and second-year degrees had better knowledge scores of COVID-19 than the first-year students, and this association between education and knowledge score was statistically significant (*P*<0.0001). All 55 (100.0%) commerce students had good knowledge, whereas among science students, 328 (95.1%) had good and 17 (4.9%) had average knowledge. Among 265 students living in rural areas, 248 (93.6%) had good knowledge, 17 (6.4%) had average knowledge, and all the students staying in urban areas had good knowledge of COVID-19 infection. The students staying in urban areas had good knowledge than students from rural areas, and this association was statistically significant (*P*=0.002, Table 2).

The median (IQR) knowledge scores among men and women were the same 6 (6-7) (*P*=0.18). The median (IQR) attitude scores among men and women were 7 (6-7) and 7 (5-7), respectively (*P*=0.44, Table 3).

Attitude towards COVID-19 infection

Out of 293 female students, a majority of them (262, 89.4%) had a positive attitude, and 31 (10.6%) had a neutral attitude towards COVID-19 infection, whereas in male students, a majority of them (86, 80.4%) had a positive attitude followed by 14 (13.1%) with negative attitude and 7 (6.5%) with neutral attitude. The female students had no negative attitude but male students had, and this association between gender and attitude score toward COVID-19 infection was statistically significant (*P*<0.0001). The majority of first-year 145 (88.4%) and second-year 74 (69.2%) degree students and all the third-year students had a positive attitude towards COVID-19 infection. The majority [299 (86.7%) and 49 (89.1%)] of science and commerce students had positive attitudes followed by neutral attitudes [32 (9.3%) and 6 (10.9%)], and negative attitudes [14 (4.0%) and 0 (0%)]. The majority [129 (95.6%) and 219 (82.6%)] of students staying in urban and rural areas had positive attitudes followed by neutral attitudes [6 (4.4%) and 32 (12.1%)] and negative attitudes [0 (0%) and 14 (5.3%)] respectively. The students from rural areas had a negative attitude towards COVID-19 infection compared to those from urban areas who had no negative attitude. The residential location of stay was significantly associated with attitude scores of students (*P*=0.0007, Table 4)

Practice toward COVID-19 infection

All the students (400, 100%) had good practices regarding COVID-19 infection, such as wearing a mask always (400, 100%) frequently washing hands using sanitizer or water and soaps (400, 100%) and obeying COVID-19 rules laid by the government (400, 100%). All the students reported that they knew about the proper way of wearing a mask (covering both nose and mouth) 400 (100%).

Table 2. Relationship between socio-demographic characteristics and knowledge score of COVID-19 infection (N=400)

Socio-demographic characteristics		Knowledge score		Total	Chi-square (*P* value)
		Good	Average		
Gender					
Male	No.	107	00	107	
	%	100.0	0.0	100.0	
Female	No.	276	17	293	6.48 (>0.01)
	%	94.2	5.8	100.0	
Total	No.	383	17	400	
	%	95.8	4.2	100.0	
Education					
1st Year degree	No.	147	17	164	
	%	89.6	10.4	100.0	
2nd Year degree	No.	107	00	107	25.5 (<0.0001)
	%	100.0	0.0	100.0	
3rd Year degree	No.	129	00	129	
	%	100.0	0.0	0.0	
Total	No.	383	17	400	
	%	95.7	4.3	100.0	
Field of study					
Science degree	No.	328	17	345	
	%	95.1	4.9	100.0	
Commerce degree	No.	55	00	55	1.74* (0.15)
	%	100.0	0.0	100.0	
Total	No.	383	17	400	
	%	95.7	4.3	100.0	
Residential locality					
Urban	No.	135	00	135	
	%	100.0	0.0	100.0	
Rural	No.	248	17	265	9.04 (0.002)
	%	93.6	6.4	100.0	
Total	No.	383	17	400	
	%	95.8	4.2	100.0	

* Fisher Exact test.

A total of 202 (50.5%) respondents consumed herbal medicine (turmeric, ginger, pepper, and tulsi) to prevent COVID-19. The majority of 339 (84.7%) students said that they would always ask their friends to wear masks, and 61(15.3%) would ask occasionally.

Discussion

The present study was conducted in science and commerce college-degree students. In our study, 293 (73.25%) respondents were female and 107 (26.75%) were male. Similarly, the cross-sectional studies conducted by Shabadi et al (14) in Mysuru, Paudel et al (8) in Nepal, Hatabu et al (15) in Japan, Naseef et al (16) in Birzeit reported that the number of female students were more than the male students [130 (50.8%) vs. 126 (49.2%), 191 (52.8%) vs. 171 (47.2%), 402 (52.5%) vs. 364 (47.5%) and 488 (73.4%) vs. 177 (26.6%) respectively]. In our

Table 3. Distribution of median scores of knowledge and attitude towards COVID-19 infection and gender of the study participants (N=400)

Gender	Knowledge score		Mann-Whitney U test	Attitude score		Mann-Whitney U test
	Median	IQR		Median	IQR	
Male (n=107)	06	6-7		07	6-7	
Female (n=293)	06	6-7	14405.5, P=0.18	07	5-7	14961.5, P=0.44
Total (N=400)	06	6-7		07	5-7	

Table 4. Relationship between Socio-demographic characteristics and attitude score towards Covid-19 infection (N=400)

Socio-demographic characteristics		Attitude score			Total	Chi-square (P value)
		Positive	Neutral	Negative		
Gender						
Female	No.	262	31	00	293	
	%	89.4	10.6	0.0	100.0	40.42 (<0.0001)
Male	No.	86	07	14	107	
	%	80.4	6.5	13.1	100.0	
Total	No.	348	38	14	400	
	%	87.0	9.5	3.5	100.0	
Education						
1st Year degree	No.	145	12	07	164	
	%	88.4	7.3	4.3	100.0	
2nd Year degree	No.	74	26	07	107	
	%	69.2	24.3	6.5	100.0	*
3rd Year degree	No.	129	00	00	129	
	%	100.0	0.0	0.0	0.0	
Total	No.	348	38	14	400	
	%	87.0	9.5	3.5	100.0	
Field of study						
Science degree	No.	299	32	14	345	
	%	86.7	9.3	4.0	100.0	
Commerce degree	No.	49	06	00	55	2.39 (0.30)
	%	89.1	10.9	0.0	100.0	
Total	No.	348	38	14	400	
	%	87.0	9.5	3.5	100.0	
Residential locality						
Urban	No.	129	06	00	135	
	%	95.6	4.4	0.0	100.0	
Rural	No.	219	32	14	265	14.32 (0.0007)
	%	82.6	12.1	5.3	100.0	
Total	No.	348	38	14	400	
	%	87.0	9.5	3.5	100.0	

*Fisher's exact test=Not applicable due to small subsample.

study, most students were from rural areas (265, 66.25%) compared to urban areas (135, 33.75%). Similarly, the cross-sectional study carried out by Angelo et al (13) at Mizan Tepi University reported that the majority of respondents (232, 54.97%) were from rural areas and 190 (45.1%) from urban areas. In contrast the studies conducted by Shukla and Deotale (17) in Maharashtra, and Reuben et al (18) in North-central Nigeria, reported that the majority of participants were from urban areas compared to the rural area [467 (81.6%) & 105 (18.4%) and 331 (56.2%) & 258 (43.8%)] respectively.

In our study, all men 107 (100%) had good knowledge regarding COVID-19 infection, whereas 276 (94.2%) females had good and 17 (5.8%) had average knowledge (P>0.01). A similar finding was found in a study done in undergraduate students by Peng et al (19), i.e. women had higher knowledge scores than men. The median (IQR) knowledge score among men and women was the same 6 (6-7) (P=0.18). Similarly, the cross-sectional study carried out by Shabadi et al (13) in Mysuru showed that the median (IQR) knowledge scores among men and women were 5 (4-5) and 5 (4-6), respectively (P=0.057). Whereas in the study of Sazali et al (20) and Srivastava and Reddy (21), men had a higher median knowledge score [men 78.5 (13.0) vs. women 77.0 (12.0)] and the mean scores respectively (P>0.05). This deference in our study may be due to more access to electronic gadgets and the internet in men than in women. In the present study, all the third-year 129 (100%) and second-year 107 (100%) degree students had good knowledge scores regarding COVID-19 compared to first-year students, and 147 (89.6%) had good knowledge, and 17 (10.4%) had average knowledge (P<0.0001). The cross-sectional study conducted by Shabadi et al (14) in Mysuru reported that median (IQR) knowledge scores for the first, second, third and fourth years were 5 (4-5.25), 4 (3-5), 5 (4-6) and 5 (4-6) respectively. This difference may be due to increased awareness and maturity among students as they academically progress.

In the present study, more women (262, 89.4%) had positive attitude toward COVID-19 infection compared to men (86, 80.4%) (P<0.0001). A similar finding was reported by Peng et al (19). The median (IQR) attitude scores among men and women were 7 (6-7) and 7 (5-7), respectively (P=0.44). Similarly, the cross-sectional study carried out by Shabadi et al (14) in Mysuru showed that the median (IQR) attitude scores among males and females were 4 (2-5) and 4 (2-5), respectively (P=0.699). However, the studies of Sazali et al (20) and Srivastava and Reddy (21), showed that men had slightly higher median attitude scores [49 (5.25) vs. 48.5 (5.25)] and the mean score. In this study, the majority of first-year (145, 88.4%) and second-year (74, 69.2%) degree students had positive attitude scores toward COVID-19 infection, followed by neutral [12 (7.3%) and 26 (24.3%)] and negative attitudes [7 (4.3%) and 7 (6.5%)]. The cross-sectional study conducted by Shabadi et al (14) in Mysuru revealed that median (IQR) attitude scores for the first, second, third

and fourth years were 3 (2-5), 4 (2-5), 4 (2-5) and 4 (2.5-5) respectively.

In the present study, all the participants (N = 400) had good practices against COVID-19 infection. In contrast, the study by Peng et al (19) stated that women had better practice than men. Whereas the study by Srivastava and Reddy (21), reported that always practicing appropriate COVID-19-related behaviors among the students was between 54.21% and Kumar et al (22) reported as 0.22% to 60.54%. The good practices in our study could be due to the government's consistent efforts to deliver the dos and don'ts about COVID-19 infection through all the media and platforms. However, COVID-19 practices could not be observed because of lockdown; hence we tried to determine the practices using a self-administered questionnaire.

Conclusion

In our study, the male students had better knowledge about COVID-19 infection, but the positive attitude towards COVID-19 was higher among female students. The practice regarding COVID-19 infection was satisfactory among all the students.

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