Original Research Article

A Study on Assessment of Knowledge and To Create Awareness Regarding COVID-19 Infection and Its Preventive Measures among Health Care Students and Non-Health Care Students

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ABSTRACT

Background: The World Health Organization (WHO) declared covid-19 as a pandemic on 11th march 2020. Since no treatment is available, following preventive measures is only the effective way to stop the spread of covid-19. This study aimed to assess knowledge regarding covid-19 and its preventive measures and to create awareness about covid-19 among healthcare students and non-healthcare students.
Methods: An online cross sectional study was conducted in 2 months i.e., from 1st Aug. 2020 to 30th Sept. 2020 among healthcare students and non-health care students. To determine the scoring of questionnaire, mean of knowledge scores and standard deviation were calculated.
Results: A total of 766 students were participated in this study. The age of participants ranged from 18 to 23. Males were 496 and females were 270. Health care students were 423 and 343 students are non-health care students. Overall knowledge about covid-19 infection was good among 480 students, average among 183 students and was poor among 103 students. The mean knowledge score of healthcare students (8.41) is higher than non-health care students (6.11) towards covid-19 infection and its preventive measures.
Conclusion: This study reveals that majority of the students were knowledgeable about covid-19 infection and its preventive measures. The mean knowledge score of healthcare students (8.41) is higher than non-health care students (6.11) indicating that the health care students have more knowledge. Though the overall knowledge on covid-19 was good enough among health care students and non-health care students, still there is a need for education to increase knowledge especially among non-health care students.

Keywords: SARS-COV 2 virus, Covid-19 infection, health care students, non-healthcare students, knowledge, awareness, India.

INTRODUCTION

A novel coronavirus is a new strain of the infectious disease that was not previously identified in humans [1] that causes a coronavirus disease 2019, is an emerging disease that was first identified in Wuhan (China) on December 2019, so named as COVID-19.

The World Health Organization (WHO) declared COVID-19 as an international public health emergency and requests all countries for collaborative efforts to break the chain of spreading. [2]

In December 2019, there was an increase in pneumonia cases of unknown reason over the world. World Health Organisation named this disease as COVID-19 (Corona virus Disease 2019) on 11th February 2020. This novel corona virus is to be believed to get spread from the bat and later on a human to human transmission. [3] Coronavirus disease (COVID-19) is caused by SARS-COV 2 virus.

Coronavirus is one of the major pathogens that mainly targets the human respiratory system (lungs). Previous outbreaks of coronaviruses include Middle East respiratory syndrome (MERS)-Cov and the severe acute respiratory syndrome (SARS)-Cove which have been previously characterized as agents that are a great public health threat. [4]

Researchers across the globe are working continuously on transmission routes, treatments, and outcomes of COVID-19. [5,6]

Covid-19 is a single-stranded RNA virus. The nucleocapsid protein formed the capsid outside the genome and the genome is further packed by an envelope and is associated with structural proteins. It primarily infect human lung cells through a receptor for an enzyme called Angiotensin Converting Enzyme 2 (ACE2).[7,8]

Covid-19 patients may be asymptomatic or they may have flu-like symptoms. There is no specific treatment for Covid-19 infection, so health care providers treat the symptoms with supportive care. [9]

The incubation period is thought to be within 14 days following exposure, with most cases occurring between four to five days of infection. [10] This period may be different according to the age and the immunity of the patient which can unmatch the frame of time.

The most common symptoms at onset of covid-19 illness are fever, cough, fatigue and others include sputum production, headache, haemoptysis, diarrhoea, dyspnoea. During March 2020, anosmia (loss of smell) was reported in some cases. [11]

Clinical features revealed by CT scan presented as Pneumonia, in some cases the multiple peripheral ground glass opacities were observed in sub pleural regions of both lungs. [12]

Individual- to -individual transmissions happens principally employing when the infected person came directly in touch with the non-infected person or when the infected person cough or sneeze then the droplets are leads to the transmission. [13]

COVID- 19 IN INDIA

The Government of India has taken stringent preventive and precautionary measures against covid-19 to control its spread, safeguard citizens and ensure their well-being. Arogya Setu (literally, bridge for disease freeness) a mobile application to connect essential health services with the people of India was developed by government of India. [14]

The first case in India was reported in the state of Kerala in January 2020 in student returning from china due to the lock down in the Wuhan city due to the virus outbreak.

After 14 hours voluntarily public curfew named as *Janata Curfew*, India immediately announced the implementation of a national wide complete lockdown, which only allowed essential services to operate over so million people of India.

COVID-19 has reached the pandemic state and it's necessary to follow preventive measures to eradicate the spread of disease. [15] It is also necessary for the public to know about covid-19 infection. For this reason we aimed to investigate the knowledge towards the present emerging health crisis among students (both health care and non-health care students).

The aim of the current cross sectional study is to assess the knowledge and to create awareness about covid-19 infection and its preventive measures among students (both health care and non-health care students)

MATERIALS AND METHODS
Study design: Prospective cross sectional study
Study duration: This study was conducted in 2 months i.e., from 1st Aug. 2020 to 30th Sept. 2020 among healthcare and non-health care students
Study population: 766 students were participated in this study.

Source of data and materials: This study was conducted during the days of lockdown. Due to corona virus outbreak it was difficult to do community based study, so an online study was designed. So a Google form containing questions was created and shared it to social media like gmail, WhatsApp, Facebook, Instagram etc.

Study tool: Questionnaire composed of participant demographic details and questions regarding knowledge about covid-19. The questions were framed using information from WHO guidelines, ICMR guidelines, CDC guidelines and other government websites and standard publications.

The questions assessing knowledge regarding covid-19 infection were given with True, False and I don't know options. Each correct answer was scored with "1" point and an incorrect answer with "0" point. An overall score range of 0 to 10 is marked with greater than 8 points shows good knowledge.

Ethical consideration: The consent of participant was taken at the beginning of the survey. Participants who gave consent to participate in the survey would click the 'yes' button and they are directed to complete the questionnaire regarding covid-19 knowledge

STATISTICAL ANALYSIS

Statistical analysis were performed on the data, simple percentages were calculated. The recorded data was compiled in spreadsheet (Microsoft Excel). To determine the scoring of questionnaire, mean of knowledge scores and standard deviation were calculated.

RESULTS
DEMOGRAPHIC DETAILS:

Age: A total of 766 students were participated in this study. The age of participants ranged from 18 to 23 (Mean-20.5, Std.Dev- 1.87). Among 766 students, 17 students are of 18 years of age, 132 students are of 19 years, 90 students are of 20 years, 252 students are of 21 years, 211 students are of 22 years and 64 students are of 23 years of age. Most of the students participated in this study are of 19, 21 and 22 years of age.

Gender: Among 766 students, male students are 496 and female students are 270. Most of the students participated in this study are males.

Education: Among 766 students, 423 students are health care students and 343 students are non-health care students. Most of the students participated in this study are health care students.

Table 1: Demographic details of the participants

Synod	Demographic Variables	Sub Groups	No. of Students	Percentage
1.	Age	18	6	0.7
		19	132	17.2
		20	90	11.7
		21	263	34.3
		22	211	27.5
		23	64	8.3
2.	Gender	Male	496	64.8
		Female	270	35.2
3.	Education	Health Care Student	423	55.2
		Non-Health Care Student	343	44.8
4.	Health Care Student	MBBS	53	12.5
		Pharm.D	105	24.8
		Bds/Mds	61	14.4
		B.Sc Nursing	61	14.4
		B.Pharm	89	21
		Others(Physiotherapy etc)	54	12.8
5.	Non-Health Care Student	B.Tech/M.Tech	113	32.9
		Degree	112	32.6
		Agricultural	71	20.6
		MBA	47	13.89

Among 423 health care students, 53 students are from MBBS, 105 students are from Pharm.D, 61 students are from BDS/MDS, 64 students are from B.Sc

Nursing, 89 students are from B.Pharm, and remaining 54 students are from other health care courses such as physiotherapy, veterinary. Most of the health care students participated in this are from Pharm.D.

Among 343 non-Health care students, 113 students are from B.Tech/ M.Tech, 112 students are from Degree, 71 students are from agricultural courses and 47 students are from MBA course. Most of the non-health care students participated in this study is from B.Tech/ M. Tech.

KNOWLEDGE REGARDING COVID-19 AMONG HEALTH CARE AND NON HEALTH CARE STUDENTS

The questionnaire assessing knowledge was answered on a True/ False basis and an additional I don't know option. 10 questions were asked about covid-19 infection and its preventive measures. An additional five general questions were asked to know their attitude and practice towards covid-19 infection, vaccination and lock down which were not given any score.

Table 2: Knowledge regarding Covid-19 among Healthcare students and Non-Health care students

Questions	True		False		Don't know		Correct answer	
	Health care (%)	Non-health care (%)	Health care (%)	Non-health care (%)	Health care (%)	Non-health care (%)	Health care (%)	Non-health care (%)
1. COVID-19 means corona virus disease-2019 & it is caused by SARS-CoV2.	410 (96.9)	310 (90.4)	7 (1.7)	13 (3.8)	6 (1.4)	20 (5.8)	410 (96.9)	310 (90.4)
2. The current estimated incubation period of COVID 19 is 2-14 days (COVID-19 symptoms appear within 2 - 24 days).	376 (88.9)	245 (71.4)	20 (4.7)	35 (10.2)	27 (6.4)	63 (18.4)	376 (88.9)	245 (71.4)
3. COVID-19 infection spread through Respiratory droplets of infected person, Close contact with the infected person, Touching a surface or object contaminated with virus, Hand shaking.	380 (89.8)	253 (73.8)	18 (4.3)	47 (13.7)	25 (5.9)	43 (12.5)	380 (98.8)	253 (73.8)
4. The main clinical symptoms of COVID-19 are fatigue, fever, dry cough, myalgia, shortness of breath & headache.	356 (84.2)	230 (67.1)	19 (4.5)	42 (12.2)	48 (11.3)	71 (20.7)	356 (84.2)	230 (67.1)
5. Washing hands, wearing mask, avoid going to crowded places, disinfecting contaminated surfaces, maintaining social distance (3 feet) from others are the preventive measures of COVID-19.	366 (86.5)	278 (81)	17 (4)	32 (9.3)	40 (9.5)	33 (9.6)	366 (86.5)	278 (81)
6.Older adults and those with severe chronic illness such as lung or heart diseases, Hypertension, Diabetes etc. are at high risk of getting infected with covid-19.	354 (83.7)	229 (66.8)	28 (6.6)	52 (15.2)	41 (9.7)	62 (18.1)	354 (83.7)	229 (66.8)
7. Isolation & treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of COVID-19 virus	347 (82)	252 (73.5)	31 (7.3)	43 (12.5)	45 (10.6)	48 (14)	347 (82)	252 (73.5)
8. Currently there is no specific treatment for COVID-19, but early symptomatic & supportive treatment can help most patients recover from the infection.	355 (83.9)	240 (70)	42 (9.9)	55 (16)	26 (6.1)	48 (14)	355 (83.9)	240 (70)
9. People who have contact with the person infected with COVID-19 virus should be immediately isolated in proper place	353 (83.5)	256 (74.6)	39 (9.2)	43 (12.5)	31 (7.3)	44 (12.8)	353 (83.5)	256 (74.6)
10. It is not necessary for children and young adults to take measures to prevent the COVID-19 infection	138 (32.6)	116 (33.8)	263 (62.2)	184 (53.6)	22 (5.2)	43 (12.5)	263 (62.2)	184 (53.6)

On asking about Covid-19 caused by SARS-CoV2, 410 health care students and 310 non- health care students said correct answer which indicates most of the students were aware of covid-19 cause.

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For the question related to incubation period of covid-19, 376 health care students and 245 non-health care students said correct answer and for spreading of covid-19 infection question, 380 health care students and 253 non-health care students said correct answer.

On questioning about Covid-19 symptoms, correct answer was said by 356 health care students and 230 non-health care students.

On questioning about Covid-19 preventive measures, the correct answer is true which is said by 366 health care students and 278 non-health care students.

On asking about risk of covid-19 infection in older adults and other diseased patients, 354 health care students and 229 non-health care students answered correctly.

On questioning about effective ways to reduce covid-19 spread, the correct answer was said by 347 health care students and 252 non-health care students.

On asking about covid-19 treatment, 55 health care students and 240 non-health care students said correct answer.

When questioning about isolation of patients infected with covid-19, 353 health care students and 256 non health care students gives correct response.

For the question, it is not necessary for children and young adults to take measures to prevent the covid-19 infection; the correct answer is False and is said by 263 health care students and 184 non health care students. Most of the students were failed to answer this question correctly.

ATTITUDE AND PRACTICE TOWARDS COVID-19, VACCINATION AND LOCK DOWN

When questioning the participants about their attitude and practices towards covid-19 infections, most of the students said that they were following covid-19 rules and they will inform to healthcare officer if they got symptoms related to covid-19.

Most of the students got information related to covid-19 from news channels and TV followed by government hospitals and websites, social media, family and friends.

Table -3: Attitude and Practice towards Covid-19, Vaccination and Lock Down

Questions	Healthcare students (%)	Non-health Care students (%)
1. Are you following COVID-19 preventive measures like washing hands, wearing mask, social distance.		
Yes	332(78.5)	242(70.6)
No	39(9.2)	53(15.5)
Sometimes	52(12.3)	48(14)
2. If you are suffering from any of the symptoms of COVID-19, will you go to hospital/ inform to the health care officer		
Yes	315(74.5)	230(67.1)
No	42(9.9)	41(12)
May be	66(15.6)	72(21)
3. Where did you get the information related to COVID-19		
News Channels, TV	182(43)	142(41.4)
Govt hospitals & websites	107(25.3)	96(28)
Social media	54(12.8)	58(16.9)
Family & friends	80(18.9)	47(13.7)
4. What is the name of the company located in Hyderabad that has been trying to develop vaccine against COVID-19		
Bharath Biotech	310(73.3)	225(65.6)
Novartis	47(11.1)	66(19.2)
Dr.Reddy's Laboratories	43(10.2)	31(9)
Hetero	23(5.4)	21(6.1)
5. Do you agree that lock down in India will be useful for controlling COVID-19 infection		
Yes	309(73)	223(65)
No	57(13.5)	46(13.4)
Don't know	57(13.5)	74(21.6)

When questioning the participants about the vaccination i.e., name of the company located in Hyderabad that has been trying to develop vaccine against

COVID-19, most of the students said Bharath Biotech, followed by Novartis, Dr. Reddy's Laboratories and Hetero. The correct answer is Bharath biotech and it is said by 310 health care students and 225 non health care students.

When questioning the participants that lock down in India will be useful for controlling covid-19 infection, 309 healthcare and 223 non-health care students said yes. 57 health care and 46 non-healthcare students said no. Remaining 57 health care students and 74 non health care students said they don't know.

LEVEL OF KNOWLEDGE

Level of Knowledge was assessed about covid-19 infection and its preventive measures. Knowledge is categorised into good, average and poor.

The participants who scored 8 to 10 points, considered them as having good knowledge, who scored 6 to 7 points as having average knowledge and those scored less than 5 as having poor knowledge.

Overall knowledge about covid-19 infection and its preventive measures was good among 480 students, average among 183 students and was poor among 103 students.

Among the 480 students who were having good knowledge, 318 students were health care students and 162 students were non-health care students.

Among the 183 students who were having average knowledge, 78 students were health care students and 105 students were non-health care students.

Among the 103 students who were having poor knowledge, 27 students were health care students and 76 students were non-health care students.

Table -4: Level of knowledge among healthcare students and non-health care students

Level of knowledge	Health care (%)	Non health care (%)	Total students (%)
Good knowledge (8-10points)	318 (75.1)	162(47.3)	480 (62.6)
Average knowledge (6-7points)	78(18.4)	105(30.6)	183 (23.9)
Poor knowledge (below 5 points)	27(6.38)	76(22.1)	103(13.5)
Total	423 (100)	343(100)	766 (100)

MEAN OF KNOWLEDGE SCORES

The mean knowledge score of students aged 23 was high followed by students of aged 21, 22, 19, 20, and 18. When compared to males, females have somewhat high mean knowledge score.

There is no significant difference between means of males (7.26) and females (7.61), but females have somewhat higher mean of knowledge score than males.

The mean knowledge score of healthcare students (8.41) is higher than non-health care students (6.11) indicating that the health care students have more knowledge towards covid-19 infection and its preventive measures than non-health care students.

Table- 5: Mean and standard deviation of knowledge scores of students according to their age, gender and education

S.No	Demographic variables	Sub groups	Mean(standard deviation) of knowledge scores
1.	Age	18	6.5 (1.37)
		19	7.25 (2.12)
		20	7.24 (2.14)
		21	7.44 (2.08)
		22	7.33 (2.13)
		23	7.8 (1.97)
2.	Gender	Male	7.26 (2.10)
		Female	7.61 (2.08)
3.	Education	Health care student	8.41 (1.65)
		Non-Health care student	6.11 (1.88)

DISCUSSION

Covid-19 is rapidly spreading in India. Currently there is proven treatment, prevention is the most important measure that can be taken. For that people need to be

educated about the covid-19 infection and its preventive measures.

The identification and isolation of a suspected case is the most important step in curbing the spread of covid-19.

India is having lockdown measures since 25th march 2020. During this period all students were at their home. Whatever level of knowledge and awareness they were having during this survey, possibly it might have been gained through previous orientation and training during the course study and presently by social media, internet, news channels, official web sites etc.

We present here a study of assessment of knowledge of covid-19 among healthcare and non-health care students. This study provides an insight into the knowledge and awareness of healthcare and non-health care students on covid-19 at the time of outbreak in 2020.

Among the students who participated in this study, most of the students are healthcare students followed by non-health care students. Their age ranged from 18 to 23. Most of the responses are received from males followed by females. The overall responses to the study were satisfactory because, overall a correct response of knowledge about covid-19 and its preventive measures was recorded at 78%.

While assessing the knowledge about covid-19, it was found that health care students have more knowledge than non-health care students. The mean knowledge score of health care students is higher than mean knowledge score of non-health care students.

Most of the students (62.6%) scored 8 to 10 points indicating that all these students are aware of covid-19 infection and its preventive measures. 23.9% students were having average knowledge and 13.5% were having poor knowledge, indicating that these students are unaware of covid-19 infection and preventive measures and they have to be counselled about covid-19 and its preventive measures.

Health education programs aimed at improving covid-19 knowledge are necessary to present positive attitudes and maintain appropriate practices. This study reveals the level of knowledge regarding covid-19 outbreak among students.

When questioning about cause of covid-19, incubation period, symptoms, spread, and risk of infection in adults, treatment and preventive measures, majority of the students (health care and non-health care) are answered correctly.

Most of the health care and non-health care students are answered incorrectly when they asked about preventive measures in children.

While assessing the attitude and practice towards covid-19, most of the students were following covid-19 rules and they were all said yes if they got symptoms related to covid-19, they will definitely inform to health care professional.

Most of the students got information related to covid-19 is from news channels and TV followed by government hospitals and websites, social media, family and friends.

While assessing the knowledge related to covid-19 vaccine, most of the students said correct answer indicating that they are aware of vaccine and were following updates on covid-19 vaccine.

Most of the students answered yes to the question that lockdown in India will be useful for controlling covid-19 infection, which indicates they have positive attitude towards lockdown and they are following covid-19 preventive rules.

By doing this study we tried to improve the knowledge about covid-19 infection and its preventive measures among those who had poor knowledge.

CONCLUSION

The Covid-19 pandemic has affected the world in various ways. The deficiency of information, the need for accurate information, and the rapidity of its dissemination are important, as this

pandemic requires the cooperation of entire populations.

Despite many awareness programs conducted by government and other agencies, there are certain false beliefs among the students (both health care and non-health care) towards the transmission, prevention and treatment of covid-19.

The mean knowledge score of health care students is higher than mean knowledge score of non-health care students indicating health care students have more knowledge than non-health care students.

A considerable fraction of students (both health care and non-health care students) were having poor knowledge towards the transmission of new corona virus, prevention and treatment.

Though the overall knowledge on covid-19 was good enough among health care students and non-health care students, still there is a need for education to increase knowledge especially among non-health care students

Most of the students following precautions to prevent spread of covid-19 infection. Most of the students are positive towards the lockdown and they were believing that lockdown in India will be helpful for controlling spread of covid-19 infection.

To conclude, the present study revealed that health care students have more knowledge towards covid-19 infection and its preventive measures than non-health care students.

The results of this study suggest that higher attention should be given to non-healthcare students.

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Ethical Approval: Approved

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