Knowledge, Attitude and Practice towards Coronavirus Disease 2019 (Covid19) Among Medical Students in a Medical College in Chennai: A Cross-Sectional Study

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ABSTRACT

OBJECTIVE: To assess knowledge, attitude, and practice of medical students towards coronavirus disease 2019 (COVID-19).

METHODS: A self-designed questionnaire was developed and given to the students of ESIC Medical College and PGIMSR, Chennai . The demographics, mean knowledge, attitude, and practice of the participants were investigated, and the scores were calculated. *t*-test and ANOVA were used for statistical analysis.

RESULT: Out of the 485 participants, 36.9% were males while the rest were female (63.1%); the majority of them were 21-23 years old while only 10.1% were >23 years old. Almost 80.4% of the participants belonged to the religion of 'Hindu' while only 2.3% belonged to the other religions. the high percentage of the students (74.6%) agreed that media coverage (e.g. newspaper, television, online) give much exposure to news about COVID-19 virus. In addition, the majority of the participants (74.5%) supported the lockdown of the major cities. A high percentage of the participants (70.9%) avoided unnecessary travel or outing during the outbreak. Maintaining social distance during the outbreak was the second most prevalent behavior reported by the participants. Also, a high percentage of participants used hand sanitizer, washed their hands, used a mask, covered a cough and sneeze with a tissue, which represented a good practice of the participants towards COVID-19. The knowledge scores of the male were slightly higher than that of females, although the difference was not significant (P>0.05). Higher scores of males were observed in the attitude and practice as compared with that of females, the difference was significant (P<0.05). In addition, the difference in practice score was not significant between different genders (P>0.05), therefore, it is recommended that females should pay more attention to practice towards COVID19. Secondly, the KAP score for the age-category of > 23 was higher than the other categories based on the practice score, although have more difference and significant difference among the age groups (P<0.05).With respect to the religions, participants belonging to the Islam religion had more knowledge in comparison with the Hindu, Christian, and others, although the difference was not significant (P>0.05). Also, the same trend was observed in the attitude scores, this difference was not significant (P>0.05). with respect to academic year of student participants belonging to CRRI had more knowledge and practice in compare with the others, although the difference was significant (p < 0.05).

Conclusions: The majority of the participants had good knowledge, positive attitude, and sufficient practice. Females and males have significantly different practices. Although the results are very positive, it is suggested that people should continue to strengthen knowledge, attitude, and practice towards COVID-19, so that India can win the battle against the disease.

KEYWORDS: Coronavirus Disease, self-designed questionnaire, ESIC, CRRI, KAP

INTRODUCTION:

Coronavirus disease 2019 (abbreviated "COVID-19") is is highly infectious, and its main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea.(1) The 2019 novel coronavirus (2019-nCoV) or the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2).The current decade further ascended with the emergence of the first outbreak of pneumonia of unknown-origin (3). In response to this serious situation, the World Health Organization (WHO) declared it a public health emergency of international concern(4)

A coronavirus (CoV) was recognized as the cause of PUO and being different from the previous human coronavirus, SARS-CoV, (5). CDC recommends, coronavirus spreads mainly from personto-person by close contact (within about 6 feet) with infected peoplevia respiratory (coughs or sneezes) or transmitted by touching asurface or object that the virus on it[6].

Subsequently, the International Committee on Taxonomy of Viruses(ICTV) proposed its name as Severe Acute Respiratory Syndrome-Coronavirus-2 (SARSCoV-2) (7).This nosocomial spread say be explained by basic virology: is found primarily in the lower respiratory tract, rather than in the upper airway. (8)

There have been 111,762,965 confirmed cases of COVID-19, including 2,479,678 deaths, reported to WHO as of February 2021(9).

There have been 11,030,176 confirmed cases of COVID-19 with 156,567 deaths reported as of February 2021(10).

MATERIALS AND METHODS
Participants and data collection
This cross-sectional survey was conducted among the medical students from ESIC Medical College and PGIMSR, Chennai, As we all know, social-distancing is the best way of prevention from COVID-19, therefore, instead of conducting a community-based survey, this study collected the data using Google form platform as an online survey. The link of Google form was posted and circulated using various social media platforms like Whatsapp Group and e-mail address of the students. The study participants were informed about the details of the study objectives for filling the questionnaire and confidentiality at the beginning of the survey, and informed consent was obtained from each participant. It has been disclosed to all the participants that their identification will be kept confidential and the results will be used only for research purposes.

Questionnaire
A self-designed questionnaire was prepared, which comprised two parts to collect demographic details of the participants along with KAP towards COVID-19. The questions were established on the basis of some published literature[12,13] and the authors' experience of KAP. After the preparation of the questionnaire, it was sent to some experts to consult their opinions regarding the validity of the questionnaire.

The first part of the questionnaire covered demographic information of the participants and the second part contained questions for KAP assessment. Demographic variables included age, gender, and religion. The self-designed questionnaire comprised 11 questions regarding knowledge, 4 for attitude, and 8 for practice. Knowledge questions mainly dealt with the participants' knowledge regarding clinical symptoms, transmission routes, prevention, and control of COVID-19. These questions were responded on a true/false basis with an additional "I don't know" option. The true answer was assigned with 1 point and false/I don't know answers were assigned with 0 point. Higher scores represented a better knowledge of COVID-19. Similar options were assigned for the questions related to attitude while only two options namely 'Yes' and 'No' were assigned for the questions related to practice towards COVID-19.

Statistical analyses were performed using SPSS, version 22. Knowledge, attitude, and practice scores were tested for normality of distribution using a one-sample Kolmogorov Smirnov test. Measurement data were expressed as mean±SD and categorical data were expressed as frequency and percentage. Parametric tests (*t* and ANOVA) were used for comparison between different subgroups of the participants pre-intervention. Comparisons of KAP scores among the students with respect to gender, religion, and age-category are done using independent samples *t*-test and one-way analysis of variance (ANOVA), as appropriate. The statistical significance level of the test was expressed as α=0.05.

RESULTS AND ANALYSIS:
Demographic characteristics
Frequency and percentage of all the demographic characteristics like gender, age, and religion are represented in Table 1 Frequency and percentage of all the demographic characteristics like gender, age, Academic Year of Student, and religion are represented in [Table 1]. Out of the 485 participants, 36.9% were males while the rest were female (63.1%); the majority of them were 2123 years old while only 10.1% were >23 years old. Almost 80.4% of the participants belonged to the religion of 'Hindu' while only 2.3% belonged to the other religions.

	CATEGORY	NO OF RESPONDENTS	PERCENTAGE
GENDER	Male	179	36.9
	Female	306	63.1
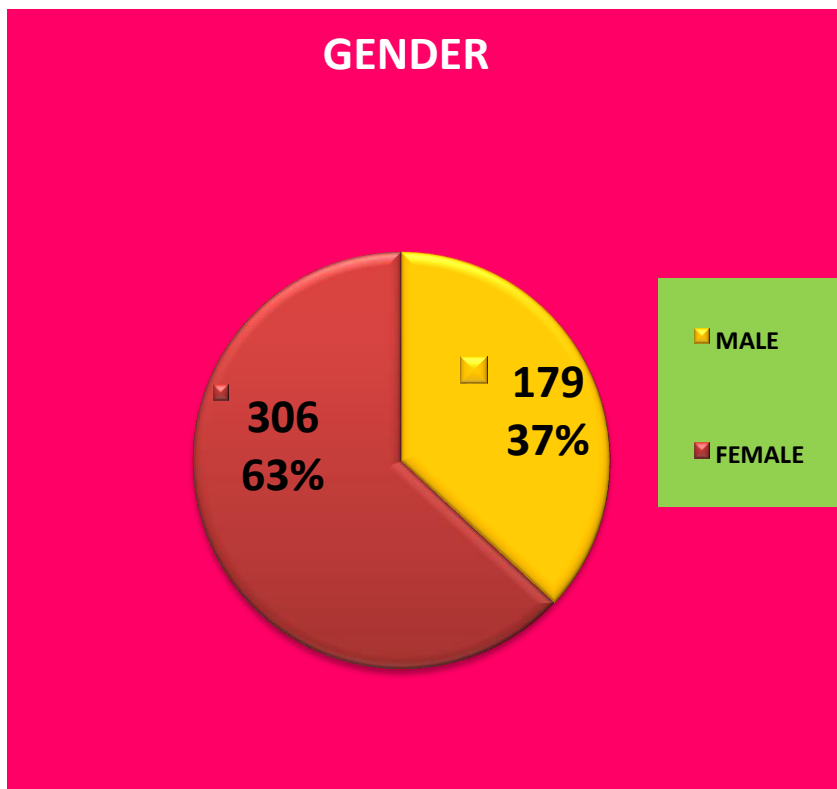
FIG.1: PERCENTAGE AND FREQUENCY DISTRIBUTION OF GENDER

AGE CATEGORY	CATEGORY	NO OF RESPONDENTS	PERCENTAGE
	18-20 Years	154	31.8
	21-23 Years	282	58.1
	> 23 Years	49	10.1
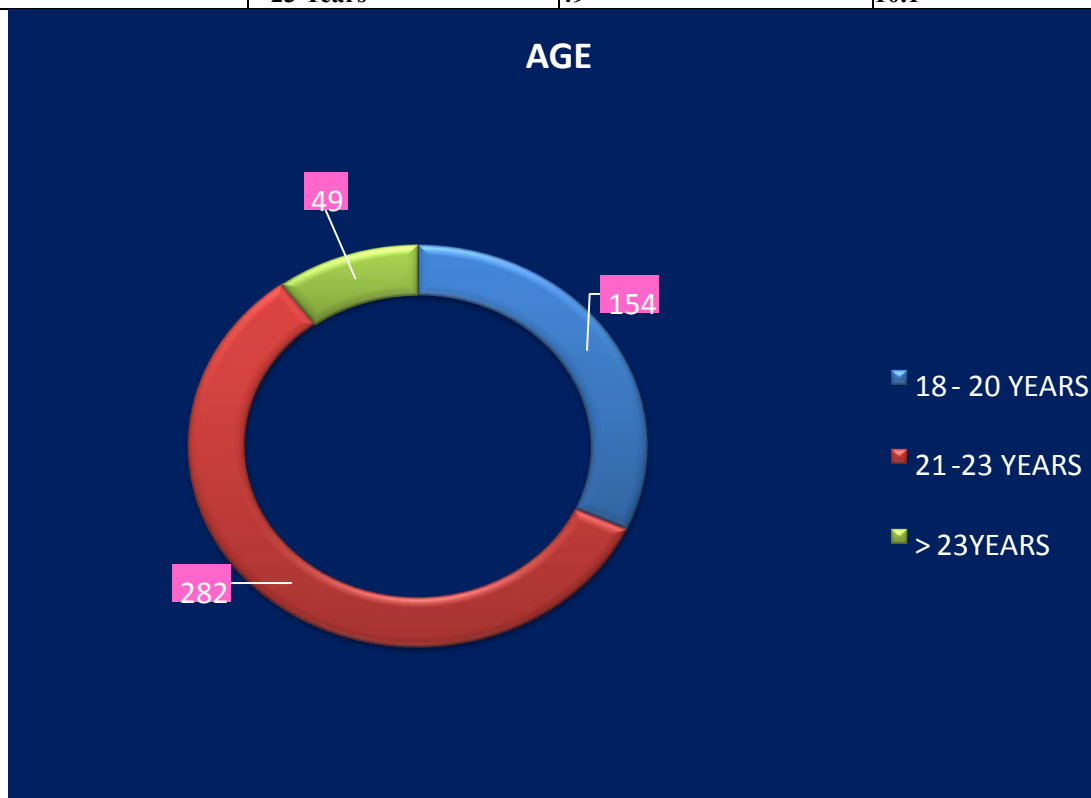
FIG.2: PERCENTAGE AND FREQUENCY DISTRIBUTION OF AGE CATEGORY

	CATEGORY	NO OF RESPONDENTS	PERCENTAGE
Academic Year of Student	**1st Year**	**101**	**20.8**
	2nd Year	**105**	**21.6**
	Final Year	**89**	**18.4**
	CRRI	**91**	**18.8**
	Pre-Final	**99**	**20.4**
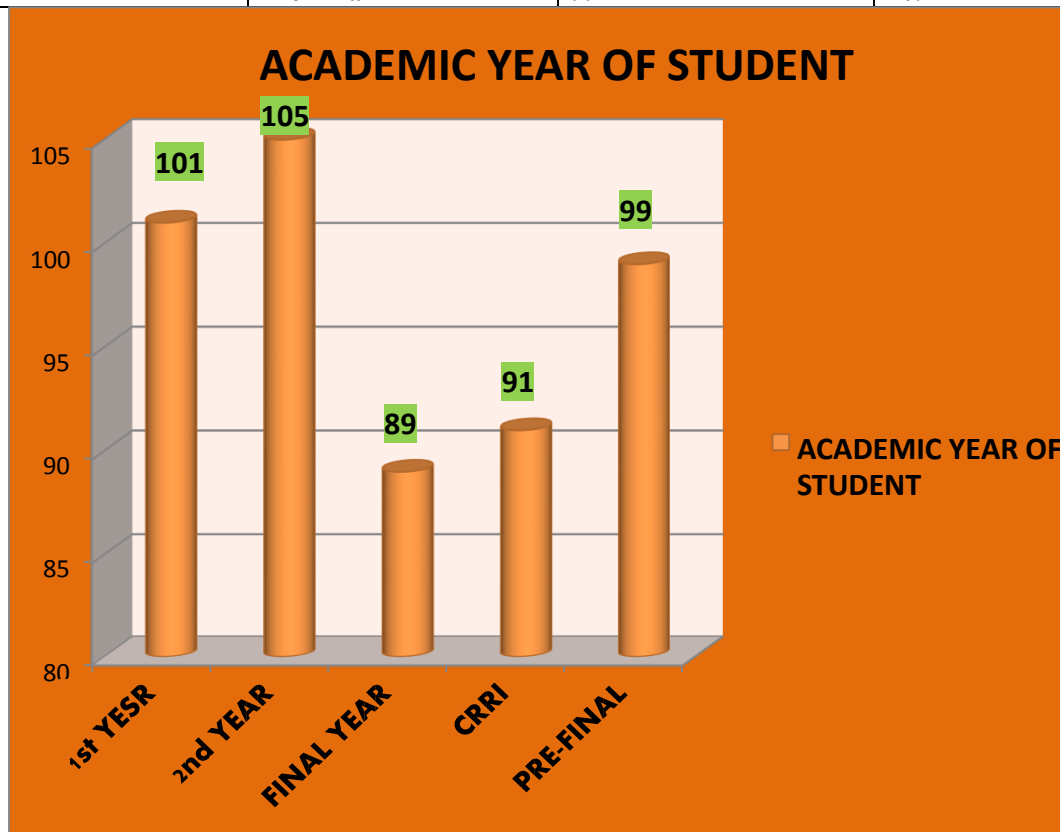
FIG.3: PERCENTAGE AND FREQUENCY DISTRIBUTION OF ACADEMIC YEAR OF STUDENT

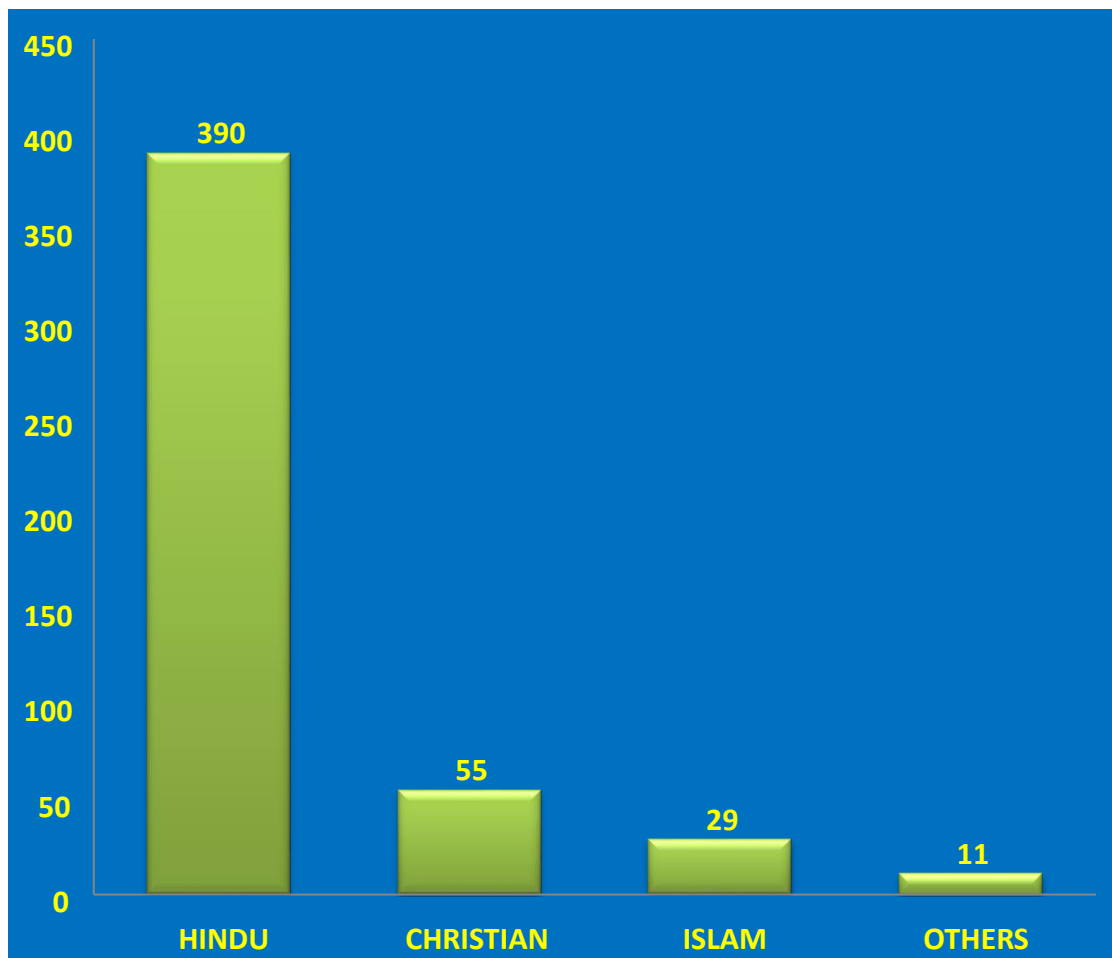|	CATEGORY	NO OF RESPONDENTS	PERCENTAGE
RELIGIONS	**Hindu**	**390**	**80.4**
	Christian	**55**	**11.3**
	Islam	**29**	**6.0**
	Others	**11**	**2.3**

FIG.4: **PERCENTAGE AND FREQUENCY DISTRIBUTION OF RELIGION** Table 1A: Results of the knowledge about on line survey (n=485)

Questions	Yes N (%)	No N (%)
Have you attended any training or webinar on COVID 19?	**122(25.2)**	**363(74.8)**
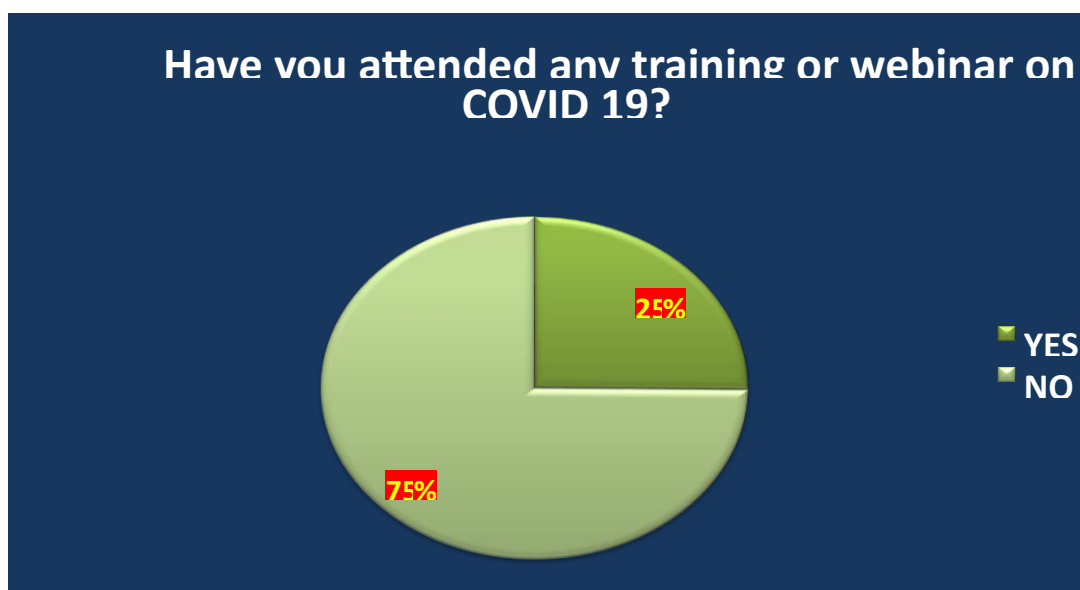
FIG.5: PERCENTAGE OF HAVE YOU ATTENDED ANY TRAINING OR WEBINAR ON COVID 19?

Questions	Yes N (%)	No N (%)
Did anyone known to you developed COVID-19 illness?	386(79.6)	99(20.4)
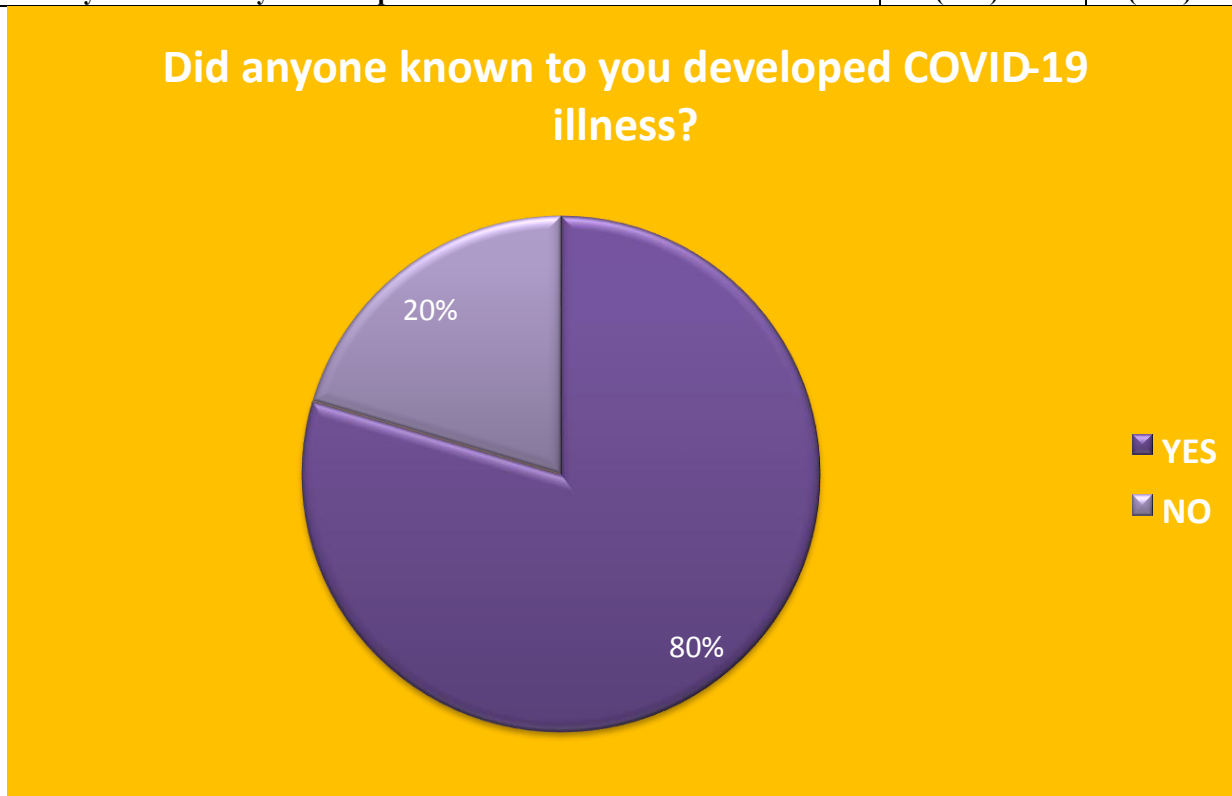
FIG.6: PERCENTAGE OF DID ANYONE KNOWN TO YOU DEVELOPED COVID-19 ILLNESS?

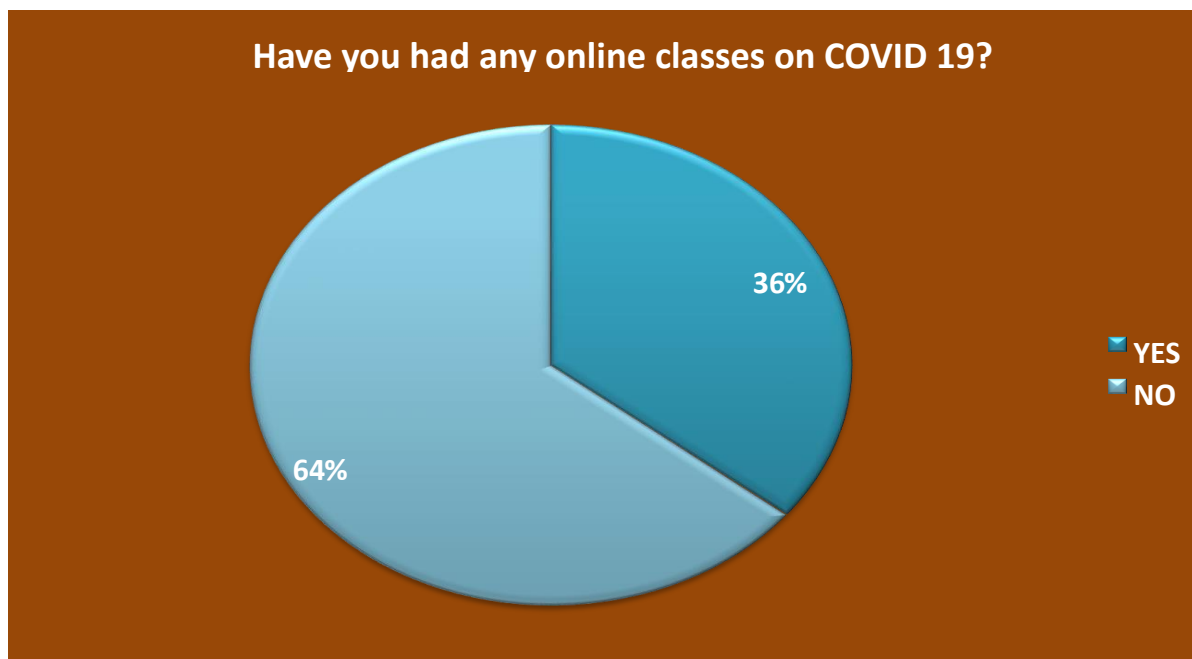| Questions	Yes N (%)	No N (%)
Have you had any online classes on COVID 19?	173(35.7)	312(64.3)

FIG.6: PERCENTAGE OF HAVE YOU HAD ANY ONLINE CLASSES ON COVID 19?

Table 2: Results of the knowledge survey (n=485)

Q1. Which of the following is NOT a main symptom of COVID 19?	Cough N (%)	MyalgiaN (%)	SneezingN (%)	Fever N (%)
	9 (1.9)	167 (34.3)	300 (61.9)	9 (1.9)
Q2. Which of the following drugs has been proven to be effective against COVID 19?	Remdesivir N (%)	Favipiravir N (%)	Tocilizumab N (%)	Others N (%)
	294 (60.6)	58 (12)	32 (6.6)	101(20.8)
Q3. Which of the following is NOT a risk factor for severe COVID 19 infection?	Smoking N (%)	School going age N (%)	Diabetes N (%)	Elderly age N (%)
	62 (12.8)	402 (82.9)	13 (2.7)	8 (1.6)
Q4. Which of the following animals is said to be the source for the SARS-CoV2 virus?	Bats N (%)	Mice N (%)	Fish N (%)	Camels N (%)
	443 (91.3)	14 (2.9)	17 (3.5)	11 (2.3)
Q5. Which of the following statements regarding transmission of SARS CoV2 is correct?	An asymptomatic person is the most potent transmitter N (%)	The virus is transmitter predominantly through human to human physical contact N (%)	The virus is transmitted predominantly through aerosols N (%)	The virus is transmitted predominantly by contaminated water N (%)
	99 (20.4)	81 (16.7)	296 (61)	9 (1.9)
Q6. Which of the following is NOT an effective strategy to prevent COVID 19?		Wearing masks N (%)	Avoiding non-vegetarian foods N (%)	Meticulous hand hygiene N (%)
		6 (1.2)	476 (98.1)	3 (0.6)
Q7. Which of the following is NOT a method for healthcare providers to protect themselves from COVID 19?	Wearing surgical scrubmade of synthetic material N (%)	Wearing PPE N (%)	Wearing medical mask N (%)	Rigorous hand hygiene N (%)
	400 (82.5)	4 (0.8)	51 (10.5)	30 (6.2)
Q8. Which of the following statements is true about the COVID 19 vaccine?	The COVID 19 vaccine is a serum obtained from convalescent individuals N (%)	The COVID 19 vaccine is an mRNA vaccine N (%)	The COVID 19 vaccine is a surface antigen vaccine N (%)	The COVID 19 vaccine is a live attenuated vaccine N (%)
	58 (12)	243 (50.1)	67 (13.8)	117 (24.1)
Q9. Which of the following statements regarding contact tracing is true?	Contact tracing is the process of identifying all people who came in contact with the infected person N (%)	Contact tracing means identifying those who did not come in contact, so that they can be allowed to go free N (%)	Contact tracing means identifying those who did not come in contact, so that they can be allowed to go free N (%)	Contact tracing is the process of identifying all people who came in contact with the infected person N (%)
	461 (95.1)	14 (2.9)	2 (0.4)	8 (1.6)
Q10. Which of the following facts about isolation is true?		Isolation is done in spacious well-ventilated rooms with adequate spacing N (%)	Isolation is done in dormitories, as all people admitted have the infection N (%)	. Isolation is done in schools and colleges, as they have open playgrounds N (%)
		427 (88)	37 (7.6)	21 (443)

Table 3: Results of the attitude survey (n=485)

Attitude Questions	Strongly Agree N (%)	Agree N (%)	Disagree N (%)	Neither agree nor disagree N (%)	Strongly disagree N (%)
Q11. Media coverage (eg. newspaper, television, online) gives much exposure to win the battle against the COVID-19 virus	100 (20.6)	262 (54)	29 (6)	84 (17.3)	10 (2.1)
Q12. The strict lockdown in India has helped reduce COVID 19 infection and mortality.	91 (18.8)	270 (55.7)	27 (5.6)	84 (17.3)	13 (2.6)
Q13. The damage during this pandemic is more due to the lockdown than due to the disease itself.	62 (12.8)	148 (30.5)	100 (20.6)	155 (32)	40 (2.1)
Q14.COVID 19 cannot be controlled at all.	23 (4.7)	71 (14.6)	216 (44.5)	133 (27.4)	42 (8.8)
Q15.COVID 19 is mainly a social media hoax.	19 (3.9)	54 (11.1)	146 (30.2)	105 (21.6)	161 (33.2)

[Table 3] shows that the high percentage of the students (74.6%) agreed that media coverage (e.g. newspaper, television, online) give much exposure to news about COVID-19 virus. In addition, the majority of the participants (74.5%) supported the lockdown of the major cities.

Table 4: Results of the practice survey (n=485)

Practice Questions	Always N (%)	Often N (%)	Sometimes N (%)	Rarely N (%)	Never N (%)
Q16. Do you practice frequent hand washing?	206 (42.5)	230 (47.4)	45 (9.3)	2 (0.4)	2 (0.4)
Q17. Do you wear a mask when you leave your home?	416 (85.8)	54 (11.1)	12 (2.5)	2 (0.4)	1 (0.2)
Q18. Do you maintain physical distance with other individuals?	125 (25.8)	246 (50.7)	96 (19.8)	13 (2.7)	5 (1)
Q19.Do you have hand sanitizer with you wherever you go?	311 (64.1)	105 (21.5)	41 (8.5)	18 (3.7)	10 (2.1)
Q20.Do you follow the media reports about COVID 19 in India?.	65 (13.4)	194 (40)	163 (33.6)	48 (9.9)	15 (3.1)
Q21.Do you avoid unnecessary outings?	168 (34.6)	176 (36.3)	106 (21.9)	20 (4.1)	15 (3.1)
Q22.Do you avoid going to crowded places?	161 (33.2)	197 (40.6)	100 (20.6)	16 (3.3)	11 (2.3)
Q23.Do you avoid using public transport?	154 (31.8)	143 (29.5)	114 (23.5)	46 (9.5)	28 (5.8)

Q24. Will you come to college if it opened soon?	Yes N (%)	No N (%)	Cannot say N (%)
	371 (76,5)	37 (7.6)	77 (17.9)
Q25. Are you anxious about COVID 19?	182 (37.6)	217 (44.7)	86 (17.7)

[Table 4] presents the health-seeking behavioral intentions and prevention practices of the participants. A high percentage of the participants (70.9%) avoided unnecessary travel or outing during the outbreak. Maintaining social distance during the outbreak was the second most prevalent behavior reported by the participants. Also, a high percentage of participants used hand sanitizer, washed their hands, used a mask, covered a cough and sneeze with a tissue, which represented a good practice of the participants towards COVID-19. However, it is recommended to store helpline number so that they can find help in case of any emergence

Table 5: Comparison of knowledge, attitude, and practice scores among different demographic variables

Variables	Knowledge Score			Attitude Score			Practice Score		
	Mean SD	±t/F Test	p-value	Mean SD ±	t/F Test	p-value	Mean ± SD	t/F Test	p-value
Male	8.49 ± 2.63	1.87	0.062ns	9.64 ± 3.36	2.04	0.042*	9.02 ± 5.31	1.81	0.71ns
Female	8.06 ± 2.27			9.09 ± 2.46			8.20 ± 4.51		
18-20 Years	7.91 ± 2.57	2.80	0.062ns	9.38 ± 2.68	0.598	0.550ns	7.50 ± 4.03	17.43	0.001***
21-23 Years	8.29 ± 2.32			9.19 ± 2.82			8.43 ± 4.76		
> 23 Years	8.80 ± 2.36			9.63 ± 3.35			12.02 ± 5.94		
Hindu	8.25 ± 2.45	0.644	0.587ns	9.28 ± 2.84	0.378	0.769ns	8.61± 4.95	0.810	0.489ns
Christian	7.84 ± 2.38			9.16 ± 2.82			8.38± 4.70		
Islam	8.52 ± 2.25			9.79 ± 2.97			7.17± 3.43		
Others	8.09 ±1.81			9.00 ± 2.57			8.64± 4.32		
1st Year	8.06 ± 2.49	9.897	0.001***	9.38 ± 2.99	0.447	0.775ns	7.16 ± 3.86	34.086	0.001***
2nd Year	7.28 ± 2.15			9.26 ± 2.71			6.79 ± 4.08		
Final Year	8.57 ± 2.44			9.09 ± 2.91			7.53 ± 3.32		
CRRI	9.30 ± 2.49			9.59 ± 2.92			13.10 ± 5.89		
Pre-Final	8.07 ± 2.08			9.16 ± 2.68			8.32 ± 3.89		

ns-Not Statistically significant, *-statistically significant at 95%, *-statistically significant at 99.9%**

[Table 5] describes the scores of knowledge, attitude, and practices towards COVID-19 with respect to demographic variables such as gender, age, academic year of student ,and religion. The knowledge scores of the male were slightly higher than that of females, although the difference was not significant (P>0.05). Higher scores of males were observed in the attitude and practice as compared with that of females, the difference was significant (P<0.05). In addition, the difference in practice score was not significant between different genders (P>0.05), therefore, it is recommended that females should pay more attention to practice towards COVID-19. Secondly, the KAP score for the age-category of > 23 was higher than the other categories based on the practice score, have more difference and significant difference among the age groups (P<0.05).With respect to the religions, participants belonging to the Islam religion had more knowledge in comparison with the Hindu, Christian, and others, although the difference was not significant (P>0.05). Also, the same trend was observed in the attitude scores, this difference was not significant (P>0.05). with respect to academic year of student participants belonging to CRRI had more knowledge and practice in compare with the others, the difference was significant (p < 0.05).

DISCUSSION

In the present study, the knowledge, attitude, and practice of the medical students of the ECIS Medical College towards COVID-19 were assessed. We found that, during the COVID-19 pandemic, 92.7% of the participants had extensive knowledge of COVID-19. In addition, more than 80% of the participants had a positive attitude towards COVID-19.

However, no significant difference was found in mean knowledge or attitude scores with respect to all demographic variables, but gender played a significant role in mean practice scores, and this result is similar to the studies conducted, which also reported that practice scores were affected by gender.It is worth mentioning that sufficient COVID-19 knowledge scores, positive attitude, and adequate practice were found among the students. Considering that the present study assessed only three demographic variables, so it is recommended that more demographic factors should be included in further studies.

Demographic factors, especially the association between gender and KAP towards
COVID-19 are generally consistent with previous studies on COVID-19 and SARS in 2003[12,) The results of this study can help to make public-health policies targeting the specific groups with low KAP and increase their KAP through well-planned, appropriate and tailored strategies. Consequently, health promotion activities are vital in improving KAP towards COVID-19, and it is recommended to conduct interventional studies using the results of this study. Positively, In the near future, India will be able to tackle COVID-19 through joint efforts of the Indian governments and all Indian residents.

The major limitation of the present study is that the sample sizes are limited to the students of a government medical college, and hence the results based on the used sample sizes could not be generalized to all the populations , although it can certainly help the state and the country to enhance the awareness regarding KAP in the general population. Due to the questionnaire being self-answered by the participants, there is also a high chance of errors or misrepresentation of information. Less demographic variables is also a limitations. In view of these, more studies should be conducted in the near future to investigate the KAP for COVID-19 at various states and countries.

CONFLICT OF INTEREST STATEMENT
The authors report no conflict of interest

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