

*Research Article***A cross-sectional survey of knowledge and practices toward COVID-19 among medical students in Northern Sri Lanka**A Paramanatham¹, N Suganthan², N Rajeshkannan³, M Luxman¹*Sri Lankan Journal of Infectious Diseases 2021 Vol.11(2):64-72*DOI: <http://dx.doi.org/10.4038/sljid.v11i2.8359>**Abstract**

The COVID-19 pandemic has created a significant threat to global health, economy and psychosocial life. It is a highly contagious disease transmitted mainly via human to human interactions. As such, control of the pandemic mainly depends on preventive strategies and safe practices. This study is aimed at assessing the knowledge and practices of medical students of the Faculty of Medicine, University of Jaffna, towards the COVID-19 pandemic.

A cross sectional study was conducted among the medical students using a self-administered questionnaire to assess knowledge and practices. Analysis was done using SPSS 26. Of 431 students, the majority (81.4%:95%CI:77.6-84.8%) answered more than 80% of the questions correctly. The most popular source for information on COVID-19 was social media (86.3%) followed by news media (63.8%). The majority of the participants (85.4%) reported they adhered to more than 80% of correct practices assessed in this study. However, only 35.5% of students attended any of the lectures/discussions on the COVID-19 pandemic held at the university and only 37.1% reported they had infection control training during their career.

Organized usage of resources and infection control training, specific to COVID-19 pandemic could be used to fill the gaps in knowledge and practices further.

Keywords: COVID-19, Medical students, Sri Lanka, Key Practices

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Received 9 April 2021 and revised version accepted 22 July 2021.



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Introduction

“Corona virus disease 2019” (COVID-19) is a respiratory illness caused by a novel corona virus (SARS-CoV-2), which was first identified as an outbreak of respiratory illness in Wuhan City in China.¹ It quickly spread in China, followed by increasing number of cases in other countries throughout the world. The World Health Organization (WHO) declared this outbreak as a public health emergency of international concern (PHEIC) on 30th of January 2020 and a pandemic on the 11th of March 2020.^{1,2} In Sri Lanka, the first imported case of COVID-19 was identified on the 27th of January 2020. On the 10th of March 2021, a Sri Lankan national was confirmed with COVID-19 for the first time.¹ In spite of implementing different preventive measures, a second wave started from a cluster of cases in October 2020.

The dominant mode of transmission of this virus is through respiratory droplets and an infected person can spread the virus while coughing, sneezing, or talking. The incubation period of COVID-19 is 2-14 days, with 80% of infected persons developing mild or no symptoms. The main symptoms are cough, fever, shortness of breathing, tiredness, body ache, loss of taste and smell, and loose bowel movements. More adversely, infection leads to respiratory failure, sepsis, and kidney failure.^{3,4} There is no proven antiviral treatment. However, since December 2020, newly developed vaccines were introduced which many countries, including Sri Lanka started to provide to their population.

During the initial days of the pandemic, despite the closure of universities, many medical students actively volunteered in their communities to provide medical assistance and support to overcome the lockdown related crisis. With time, the Sri Lankan government opened the higher educational centres and clinical students were therefore expected to continue with their clinical clerkship programs with an almost equivalent risk to other healthcare staff. Medical students also participated in health education of the patients and were expected to have a clear understanding about the pandemic. Assessing the knowledge and practices among various subgroups, including medical students is needed. This study presents data on assessment of knowledge and practices regarding COVID-19 amongst medical students at the University of Jaffna, Sri Lanka.

Methods

Study design and setting

This is a descriptive cross-sectional study, conducted from August to September 2020, in the Faculty of Medicine, University of Jaffna. During the study period, the faculty had a total of 820 undergraduate students from six batches.

Sample size determination and procedure.

As there was no similar study on medical students in Sri Lanka, the sample size was calculated based on studies from other countries (60-86%)⁵⁻⁸ and the minimum required sample size was 425. The latest enrolled students' name list was obtained from the Dean's office. Stratified random sampling was used to select 431 students from all batches using this list. From each batch name list every other student ($820/425=1.93 \text{ ---} 2$) was selected. The first student was selected randomly, either starting from the first or second name in the list. The students were

informed about the study and the voluntary nature of participation. Informed written consent was obtained.

Study variables: Knowledge and practices were assessed as independent variables. In addition, details such as gender, clinical stage year, religion, participation in any infection control programme or attendance at any COVID-19 lectures and the main source of information on COVID-19 were assessed.

Study instrument and techniques

A self-administered questionnaire, prepared by the investigators (created based on the WHO study materials and previous studies)⁷⁻⁸ was used for data collection. Questions covered demographic data (6 questions), assessment of participants' knowledge (16 questions) and practices regarding COVID -19 pandemic (20 questions). Each question was given 3 options namely "Yes" "No" and "Do not know/No Opinion". The contents of the questionnaire were assessed by general physicians and public health personnel for consensual, face and content validity and improved using their feedback.

Data processing and Analysis

The data collected was entered in an EXCEL sheet, transferred to and analysed using SPSS 26. Descriptive analysis was mainly based on frequencies and percentages. Confidence Interval (CI) was calculated for percentages where appropriate. The knowledge level was compared between the students according to the different stages in their career (pre-clinical, para clinical and clinical). Pre-clinical was defined as students in the first two years who are not required to attend teaching hospitals and who follow basic medical science subjects such as anatomy, physiology, and biochemistry. Para clinical students do their clinical clerkship in hospital in the morning and follow para clinical subjects such as pathology, microbiology, parasitology, and community medicine in the afternoon. In addition, para clinical students have community-based field visits as part of the course in Community Medicine. Clinical students spend most of their time in the wards and clinics of the Teaching hospital Jaffna and have direct contact with patients. Comparison of those with correct knowledge (more than 80% of the time) and those without were analysed using the Chi square test to identify differences between students in the three clinical stages (Table 2).

Results

Background characteristics: For this survey, 431 medical students at different stages of training were interviewed. The basic characteristics of the students are summarized in Table 1. The majority of students were female (54.6%) and belonged to the Hindu religion (52.0%). There were 76 students (17.6%) in their first year of training and 15.1% in the final year of their career. Interestingly, 64.5% had not attended any lectures or discussions on the COVID-19 pandemic prior to the study period. Only 37.1% reported that they had received any kind of infection control training during their career.

Table 1: Background characteristics of medical students(n=431)

Background Characteristics	Categories	Number	%
Gender	Male	195	45.2
	Female	236	54.8
Stage of the course	Preclinical	145	33.6
	Para clinical	138	32.0
	Clinical	148	34.4
Religion	Hindu	224	52.0
	Buddhist	119	27.6
	Muslim	68	15.8
	Catholic	20	4.6
Had you attended any lectures/discussions about the COVID -19 pandemic?	Yes	153	35.5
	No	278	64.5
Have you received any kind of infection control training since you joined the institution	Yes	160	37.1
	No	271	62.9

Knowledge towards the COVID-19 pandemic

Most of the students (81.4%:95%CI:77.6-84.8%) answered more than 80% of the questions correctly. The response to key knowledge assessment questions according to the different clinical stage category of students are summarized in Table 2. The median number for correctly answered questions to assess knowledge was 14 (87.5%) of 16 questions (Range 3-16 questions). Only 67.5% of students correctly identified the name of the virus causing COVID-19 as SARS-COV-2 and 62.2% stated that COVID-19 infection can be transmitted by eating or contact with animals. This proportion was less among para clinical students (51.5%) compared to pre-clinical students (71.0%) and increased again in the clinical years (66.9%) (P=0.002).

Source of information regarding COVID-19

Students were asked to name the main source of their information on COVID-19 infection including prevention and control. All four main sources, news media, social media, health professionals and health organization such as MOH and RDHS offices and family and friends were used by 120 students (27.8%). The most popular source was social media (86.3%) followed by news media (63.8%), family and friends (54.5%) and government health organizations website and relevant scientific article (52.2%).

Table 2: Assessment of knowledge towards selected COVID-19 aspects among medical students in their different stages of training(N-431)

Knowledge Questions	Correctly answered questions (No %)							
	Preclinical (n-145)		Paraclinical (n-138)		Clinical (n-148)		Statistics	
	n	%	n	%	n	%	Chi	P
Virology and transmission								
COVID-19 caused by novel corona virus named SARS-COV-2.	100	67.0	86	62.3	105	70.9	2.632	0.27
The incubation period for disease is 2-14 days.	130	89.7	124	89.9	122	82.4	4.68	0.096
COVID-19 spreads via respiratory droplets of infected individuals.	140	96.6	132	95.6	137	92.6	2.64	0.267
Eating or contact with animals would not contract COVID-19.	42	29.0	67	48.5	49	33.1	12.90	0.002
Asymptomatic carriers will not transmit the disease.	112	77.2	107	77.5	119	80.4	0.53	0.769
Clinical Features								
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia	141	7.2	126	91.3	118	79.7	24.39	<0.001
Majority of the cases with COVID-19 develop only mild symptoms.	106	73.1	110	79.7	125	84.4	5.76	<0.056
Severe disease mainly detected in patients who are elderly, have chronic illnesses, or are obese.	133	91.7	122	88.4	136	91.9	1.293	0.524
Treatment and Prevention								
There currently is no effective antiviral treatment for COVID-19.	127	7.6	129	93.5	142	96.0	7.71,	0.022
Wearing a face mask helps to prevent transmission of the infection	142	97.9	131	94.9	130	87.8	12.96	0.002
Effective hand washing prevents the spread of infection	144	99.3	136	98.6	137	92.6	12.69	0.002
Social distancing prevents transmission	144	99.3	135	97.8	137	92.6	10.94	0.004

Assessment of practices.

Of 20 practices assessed, the majority (85.4%: CI: 81.8-88.5) of participants reported they adhered to more than 80% of the correct practices aimed at preventing COVID-19. For example, 97% reported wearing face masks. Similarly, other practices such as washing hands regularly with soap and water (96.1%), respiratory etiquette practice (92.6%), staying at home when sick (94.8%) and social distancing 94.4% also were high among them (Table 3).

Table 3: Adherence to selected practices to prevent spread of COVID-19(n=431)

Correct Practices among medical students	n	%
Key Practices		
Wearing a face mask	418	97.0
Always maintain social distance as recommended.	407	94.4
Hand hygiene		
Wash hands regularly with soap and water	414	96.1
Use disinfectants - hand sanitizers with alcohol 60% or more	403	93.5
Cough etiquette and respiratory hygiene		
Cover cough and sneeze with a tissue, handkerchief or into the elbow	399	92.6
Isolation (avoiding contact with the people who were under self-isolation)		
Wearing appropriate PPE while examining suspected or confirmed case.	369	85.6
Staying at home as much as possible (especially when sick)	409	94.9
Other relevant Practices		
Frequent cleaning and disinfection Cleaning/disinfecting of high touch surfaces such as my phone (screen), doorknobs, desks, switch, elevator button or other belongings.	409	94.9
Avoiding public gatherings	414	96.1
Avoiding eating outside	393	91.2
Avoiding shaking hands when greeting others	414	96.1
Avoiding using public transportation when possible	398	92.3
Keeping a helpline number to contact in case you suspected that you or someone you know had symptoms of COVID-19	408	94.7

Discussion

Even after vaccination, continued adherence to correct practices are essential to prevent the spread of COVID-19. Assessment of knowledge, attitude and practices among the general public and health care personnel is therefore vital to improve the overall pandemic control.

The involvement of medical students in patient care and clinical activities causes significant risk of disease transmission among them. Clinical students have direct contact with patients and should have adequate knowledge to educate them. However according to our analysis, only 37.5% of the students attended COVID-19 education programs and only 37.1% had infection control training throughout their career at the time of the survey even though IPC (Infection Prevention Control) guidelines are part of their curriculum during the para clinical years.

In this study, more than 80% of the students correctly responded to the questions on mode of transmission and incubation period. However, only 67.5% of the study sample knew the name of the virus (SARS-CoV-2). Knowledge on clinical features, treatment and prevention was higher at 70-95%. These findings are similar to the study done in Iran⁶, which showed that almost 89.96% of candidates had positive knowledge on the COVID-19 pandemic. Similarly, high levels of basic knowledge were reported among university students in Japan, particularly on hand washing and mask wearing. Further, 96.4% of the Japanese University students showed positive knowledge regarding avoiding crowded places⁹ similar to findings in the current study which showed that 96.1% of medical students avoided public gatherings to reduce the risk of infection.

When comparing medical students at different stages of training, more clinical students (96.0%) answered correctly for availability of antiviral treatment compared to preclinical (87.5%) or para clinical students (95.5%) (P=0.022). However, with regard to hand washing and wearing face masks, more pre-clinical students answered correctly compared to para-clinical and clinical students (P>0.05).

Student responses towards correct practices, were also very positive, with most students practicing appropriate measures to prevent the spread of infection. Similarly, a study done in Pakistan among 358 university students reported high level adherence to key preventive practices toward Covid-19 such as hand washing with soap and water (90.9%), avoiding crowded places (88.1%) and avoiding patients who exhibit symptoms (93.2%).¹⁰ These findings are also consistent with studies done on medical students in Jordan, India and Afghanistan.^{5,11,12} This understanding about safe practices by medical students provides additional benefit to the society as it can reflect directly on the general public.

The majority (86.3%) of students in the current study used social media as their main source of information on the pandemic. A study conducted among 422 MizanTepi University students in Ethiopia revealed that 57.2% used social media for COVID-19 information.⁸ Similar findings were observed in a study done in Turkey in 2010 among University students during the Influenza A H1N1 pandemic which reported social media (72.1%), followed by the internet (19.9%) and (8.0%) from health personnel, as the main sources of information.¹³ Similarly, among medical students and non-medical students in Jordan, the main source of information for COVID-19 was social media (34%), followed by the WHO (19.9%), television (17.6%), internet (13%), Ministry of Health (10.1%) and friends (5.4%).¹⁴

Even though the majority of students reported overall positive knowledge, 273 students (62.2%) in the current study, responded that those who eat, or have contact with animals can contract COVID-19 infection. Similarly, in a study among 354 medical students in India, 44.4% showed the same kind of confusion.¹¹ In the current study, the proportion who believed this was significantly higher (P=0.002) among pre-clinical students (71.0%), compared with para-clinical students (51.5%), and clinical students (66.9%). This confusion could be due to confusing messages from social media. Social media users who post messages have a responsibility to communicate correct facts and regulators at country level as well as owners of social media platforms should ensure accuracy of such posts. It is also crucial that government responses should use the social media platform to counteract inaccurate information and to spread accurate and reliable facts.¹⁵ Such belief and gaps in knowledge can be rectified through organized training or lectures regarding COVID-19, in addition to infection control training in the early stages of a pandemic, as our findings showed that two thirds of students had not attended any COVID-19 related training at the time of being interviewed.

Limitations

This study was conducted among medical students at the University of Jaffna. Generalising findings to other medical or non-medical students at other universities need caution as cultural background and their courses of study need to be taken into consideration. Further studies on

assessment of attitude and practices of students would be useful, in particular as some practices such as avoiding public transport can be assessed only in a local setting.

Conclusion

This study showed that the majority of medical students had adequate knowledge and followed correct practices towards the COVID-19 pandemic. The most popular source for information in this cohort was social media. The majority of students had not attended any lectures or discussions on the COVID-19 pandemic at the time of survey. Only 37.1% reported they received any kind of infection control training during their career.

Correct information is a major requirement and is vital in the early phases of a public health emergency rather than reliance on social media. It is therefore important to ensure that students are guided to appropriate sources for information and given adequate training to reduce the gaps in knowledge.

Declarations

Acknowledgement: The authors would like to express their gratitude to all the medical students from the University of Jaffna, the Dean, lecturers and other staff members of the Faculty of Medicine, University of Jaffna for their support.

Funding: The authors have not received any funds for the study, authorship or publication.

Conflict of Interest: The authors declare that this study was conducted in the absence of any personal or financial relationships

Ethical Approval: Ethical approval for the study was received from the Ethical review committee, Post Graduate Institute of Medicine, University of Colombo (ERC/PGIM/2020/137).

Authors' contributions

AP, NS and NR conceived the study. AP, LM and NS involved in the data and sample collection. NR did analysis. AP, NR, NS and LM wrote the manuscript. All authors read and approved the manuscript

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