



Research Article

Knowledge, Attitudes and Practices of Sri Lankan Dental Undergraduates Regarding Covid-19 Pandemic

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ABSTRACT

Objective of the study was to assess knowledge, attitude, and practices towards COVID-19 infection of Sri Lankan dental undergraduates at the Faculty of Dental Sciences, University of Peradeniya, Sri Lanka. A descriptive cross-sectional study was conducted with participation of 246 undergraduate students in pre-clinical and clinical years in the Faculty of Dental Sciences, University of Peradeniya, Sri Lanka. A pretested, self-administered questionnaire sent via a Google form was used to collect data assessing above. Knowledge, practice, and fear scores of the students were assessed and compared considering their gender, age, year of study and socio-economic status. Students had a high knowledge score of 89.6%. Students had a good practice score of 84.4%. Clinical students had favorable practices to prevent spread than pre-clinical students ($p=0.026$). Mean for knowledge, practice and fear was higher among female students, but the difference was not statistically significant. Fear score was significantly higher in students who were above 25 years of age ($p=0.006$). Significant negative correlations were present between the fear score and practice score as well as the knowledge score and fear score, ($p<0.05$) indicating that the fear declines while increasing the knowledge and practice increases with the deduction of the fear. Students' overall preparedness in terms of knowledge and attitudes is adequate for the management of dental patients during the COVID-19. However, it is recommended to bridge the gaps identified to reduce fear and improve practice for safe delivery of oral health care for the community.

Keywords: COVID19; dental undergraduates; knowledge; attitudes; practice; Sri Lanka

1 INTRODUCTION

Sri Lanka was one of the few countries which managed to successfully control COVID-19 during the first wave confining the epidemic to 2,810 cases⁽¹⁾. However, with the emergence of the second wave, Sri Lankan authorities have reported 62445 confirmed cases and 305 deaths⁽²⁾. The third wave started in April 2021 was far more aggressive than the previous waves with 265,630 confirmed cases⁽³⁾.

Knowledge on mode of transmission of COVID-19 including pre symptomatic transmission and asymptomatic carrier state, risk factors, preventive methods, clinical features, and the protocol of management to be adopted by doctors, dental surgeons, dental and medical students and

other health staff is very useful in prevention of self-infection and cross infection⁽⁴⁻⁷⁾. While authorities claim vaccination of at least 60-80% of the population is the key to combat the disease, recent epidemiological studies reveals that nearly 70% of the world population is willing to get vaccinated⁽⁸⁾. Despite of vaccination, self- motivation and discipline seem to matter in a background where new strains are emerging on a regular basis. The guidelines for the general public and also for various other sectors including health care providers are laid down and these have been changed from time to time based on the current knowledge and the government policy.

Dental care providers are at high risk due to the nature of their profession, which necessitates close proximity to the patient's oro-pharyngeal region, use of droplet and

aerosol-generating dental procedures which are established modes of transmission of COVID-19 in symptomatic or asymptomatic patients⁽⁹⁾. Limiting treatment to emergent and urgent cases after a meticulous patient risk assessment and triaging all the patients is recommended to minimize the risk of COVID-19 transmission and avoid cross-contamination⁽¹⁰⁾. In addition, extra precautionary measures such as use of Personal Protective Equipment(PPE), disinfection of surfaces, equipment and air, adequate ventilation and prevention of overcrowding are needed to control the spread of this highly infectious disease⁽¹⁰⁾.

According to recent studies, knowledge, attitude and practice (KAP) of dental surgeons /students regarding COVID -19 are essential in reducing self-infection and cross infection^(11–16). The Aim of the present study was to assess the KAP of Sri Lankan dental undergraduates from first to fifth year (preclinical and clinical) regarding COVID -19 at the Faculty of Dental Sciences, University of Peradeniya, Sri Lanka, which is the only undergraduate dental training institute in the country. Further, it was planned to assess whether there is any difference in the knowledge, attitude and practices between different categories of gender, age, year of study and socio economic status of the students. Finally the possible correlations between the knowledge, attitude and practices were assessed.

2 METHODS

A descriptive cross-sectional study was conducted with the approval from the Ethical Review Committee of the Faculty of Dental Sciences, University of Peradeniya (ERC/FDS/UOP/1/2021/17) which included 246 undergraduate students in their first, second, third and fourth years in the Faculty of Dental Sciences, University of Peradeniya, Sri Lanka. A pre tested, self-administered questionnaire sent via a Google form was used to collect data regarding the students' knowledge, attitude and practices regarding COVID-19. Informed consent was obtained via the same format.

Section A of the questionnaire explored participants' knowledge and section B had eight statements to appraise their general attitudes and section C consisted of nine questions to explore their practices. Sections A, B and C were common to clinical and pre-clinical students and needed to be filled by all. Section D contained six statements which were used to assess the attitudes regarding clinical training hence needed to be answered only by the students in clinical years. (Table 1)

3 DATA ANALYSIS

The data were analyzed using SPSS 21. Mann Whitney U test was used to compare between two variables (gender, age, socio economic status, clinical versus pre-clinical) and Kruskal Wallis test was used to compare between more

than two categories (race). Kendall's Tau correlation test was used to calculate the correlations between the scores for knowledge, attitude, practice and socioeconomic status because the scores were not normally distributed.

3.1 Socio Economic Status (SES)

Socio economic status (SES) was calculated by assigning values to the responses which were based on the parents' monthly income, level of education and the occupation. A maximum value that could be obtained was twenty two. Scores obtained were converted to percentages in order to identify two levels of SES. (< 50- low, 50 or above-high)

3.2 Knowledge Score

Each correct answer for the statements in section A was given a score of one and each incorrect answer was given a zero. The sum was calculated to obtain a knowledge score.

3.3 Practice Score

For each question in section C regarding the practices, a favorable practice for prevention of the spread was given a score of one while an unfavorable practice was given a zero. The sum was calculated per student and a practice score was obtained.

3.4 Attitude and Fear Score

An ordinal Likert scale of five points was used to assess the agreement to each attitude statement (Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree). Each statement (1 to 5) in section B was analyzed separately to highlight their significance. A score for general fear regarding COVID-19 (fear score- general) was calculated using the statements 6 to 8 of section B (Table 1). In statements 7 and 8, a maximum score of five was assigned to those who strongly disagreed to the statements. A positive attitude score for clinical students was calculated by summing up the scores for attitude statements 1 to 4 in section D. A separate fear score (fear score clinical) for the category of clinical students was also calculated using the statements 5 and 6 in section D of Table 1. In statement 6, highest score was assigned to those who strongly disagreed to the statement and for statement 5 it was the opposite.

4 RESULTS

The response rate was 82%. Thirty percent were males and 70% were females. 49.6 % of the participants were in preclinical years while 50.4% were in clinical years.

4.1 Knowledge score

Students had a high knowledge score of 89.6%. Female students, students below 25 years, pre-clinical students and

Table 1: Statements regarding knowledge attitude and practices of students regarding COVID- 19 infection and pandemic

A- Knowledge Questions	
1	Main clinical symptoms of COVID 19 are fever, dry cough, and tiredness.
2	COVID – 19 symptoms appear within 2 to 14 days
3	Not all infected with COVID 19 will develop symptoms.
4	Those who are elderly, have chronic illnesses and with suppressed immunity are more likely to be severe cases
5	The COVID -19 virus mainly transmits via respiratory droplets of infected individuals
6	Persons with COVID-19 cannot infect the virus to the others if he has no symptoms of COVID-19 virus.
7	Children and young adults do not need to take measures to prevent the infection by the COVID-19 virus
8	Avoiding environments that are closed or involve close contacts important to prevent disease transmission.
9	People who have directly contacted with someone with COVID-19 virus should be immediately isolated in a proper place.
10	The current mode of treatment to patients are non-specific drugs and supportive medical treatment
11	Do you believe rapid antigen test is adequate to rule out the Covid-19 infected patients prior to start dental procedures
12	“PCR test is more reliable than rapid antigen test”. Do you agree with this statement
B- Attitude statements (common to both clinical and pre-clinical students)	
1	COVID 19 has affected my studies negatively
2	I need more education about COVID-19
3	I am willing to undergo an infection control training in dentistry for COVID-19
4	Current standard of infection control measures in the Dental faculty are at a satisfactory level in preventing the spread of COVID-19
5	I would have no objection to get quarantined if needed, while other colleagues are continuing the study program
6	As a dental student, I feel more threatened with exposure to COVID-19 infection than the general public
7	I would have no objection to work with the colleagues who has had a COVID-19 infection and recovered.
8	I would have no objection to undergo necessary investigations (PCR) if there is suspected exposure happened
C- Practices	
1	Do you participate in meetings, religious activities, events and other social gatherings or any crowded places as before COVID 19 outbreak?
2	Do you have enough supply of masks?
3	Do you use other colleagues' phones, desks, pens, or other work tools and equipment?
4	Do you like to take cooked meals from restaurants as before COVID 19 outbreak?
5	Are you regularly updating your knowledge regarding COVID 19 outbreak?
6	Do you share your meals with others?
7	Do you think it is necessary to wash your clinical wear/ clothes worn to the faculty daily?
8	Do you /Will you avoid returning to your home towns frequently, once the academic /clinical programme is started?
9	Do you use your smart devices during clinical/practical time for study purposes
D- Attitude statements – relevant to students in clinical years.	
1	I am willing to personally procure extra PPE for use in the dental clinic to prevent the spread of COVID-19
2	If patient is sneezing or coughing persistently in the dental clinic, I will stop the treatment and refer for COVID-19 test.
3	I would avoid wearing my jewelries, wrist watches, and other accessories during clinics/practical sessions than before pandemic
4	I am aware of which authority to contact if I come across a patient with suspected COVID-19 Infection
5	I would feel stressful when treating patients who have had the COVID-19 infection and recovered
6	I will treat an individual who is from a high-risk area

students with high SES had more knowledge compared to male students, students above 25 years, clinical students and students with low SES. But within categories, no significances were found for knowledge ($p>0.05$). More than 93% were knowledgeable regarding the modes of transmission, incubation period, risk categories, symptoms and methods of preventing the spread. However, they lacked knowledge regarding the testing required (44%), effects of vaccine (19%) and the current modes of treatment (18%).

4.2 Practice score

Students had a good practice score of 84.4%. Clinical students had favorable practices to prevent spread than pre-clinical students ($p=0.026$). However, only 56.3% of the students avoided sharing other colleagues' phones, desks, pens, tools and equipment; 28.2% avoided using their smart devices during clinical/ practical time for study purposes, 55% avoided buying cooked meals from the restaurants and 57% avoided sharing meals with the colleagues.

4.3 Fear score

The students demonstrated a low fear score of 31%. Despite the low fear score, majority of 79.3% of the students were feeling more threatened with exposure to COVID -19. Moreover they had specific fears as indicated by the fact that only 7% had no objection to work with a colleague who has had COVID -19 and recovered; and only 3.2% had no objection to undergo necessary testing if there is a suspected exposure. Table 2 summarizes the average values for knowledge, practice and fear scores obtained from the values of the common questions to all the respondents.

4.4 Comparison of knowledge, practice and fear in different categories

Mean for knowledge, practice and fear was higher among female students compared to male students but the difference was not statistically significant. Fear score was significantly higher in students who were above 25 years of age. ($p=0.006$) Scores for knowledge were higher in pre-clinical students whereas fear score was higher among the clinical students. However, the difference was not statistically significant. The mean score for practices was significantly higher among clinical students than the pre-clinical students. ($p=0.026$) Fear score was highest among Sri Lanka Moor students followed by Sinhalese and Tamils students, the difference being statistically significant. ($p=0.01$) There was no observed significance in any of the scores between the low and high socio-economic status. (Table 3)

4.5 Attitudes of the Students

The responses of the students to the statements 1-5 in section B were compared between the gender, age, race, socio

economic status and the undergraduate category. Students who were in low SES were willing to undergo infection control training than the students who were in high SES. The difference of agreement was statistically significant. ($p=0.02$) The pre-clinical students did not have any objection to get quarantined while other colleagues continue the study program as opposed to the students in clinical years. ($p=0.036$) (Table 4)

4.6 Attitudes and fears of students in clinical years

The average fear score of the students in clinical years (fear score clinical) was 61.2% which were high compared to general fear experienced by all the student categories. (Table 5) Specifically, 55% of the clinical students agreed that they feel stressful while treating patients who have had COVID-19 infection and recovered. In addition, only 18% of the students agreed that they'll treat patients coming from a high-risk area. Despite having a positive attitude score of 80.5 in the two groups of clinical students, only 68% were aware of which authority to contact if he/she came across a patient suspected to have Covid-19 infection.

Further, there was no statistically significant difference in either the fear score or positive attitude score between the two groups of clinical students studying in their third and fourth years. ($p<0.05$)

However, when the fear and positive attitude score were compared between the genders, female students had more fear compared to male students. ($p=0.018$) (Table 5)

4.7 Correlations between the scores

Significant negative correlations were present between the fear score and practice score as well as the knowledge score and fear score, ($p<0.05$) indicating that the fear declines while increasing the knowledge and practice increases with the deduction of the fear. However, correlations between fear- knowledge and fear- practice were weak.

There was a significant positive correlation between the practice and the SES scores. But the positive relationship was weak. ($p=0.021$, $r=0.108$) There was a significant higher score for fear in students with less socio-economic status, but the correlation being weak and negative. ($p=0.001$, $r=-0.153$). Table 6 summarizes the correlations and significances.

5 DISCUSSION

Determining the knowledge, fears, attitude and practice of dental students regarding a pandemic and preventive aspects is important in forming what education is necessary at the time. It is obvious that the faculty needs to be reopened in the new normal situation with a view of continuing dental education while ensuring the quality of the undergraduate programme. Hence, it becomes compulsory for the undergraduate students to be knowledgeable regarding all the

Table 2: Average knowledge, practice and fear scores

	N	Mean	Std. Deviation	Minimum	Maximum	Median
Knowledge	246	89.6498	11.68799	30.77	100.00	92.31
Practice	246	84.4399	9.83128	61.11	100.00	83.33
Fear Score	246	31.45	6.044	16	52	32.00

Table 3: Comparison and significance between categories for knowledge, practices and fear

Variable	Categories	N	Knowledge		Practices		Fear	
			Mean (%)	p value	Mean (%)	p value	Mean (%)	p value
Gender	Male	76	82.2	0.14	88.9	5.045	29.9	6.476
	Female	170	85.4		90.2		32	
Age category	Below 25	149	85.3	1.199	89.6	2.313	30.1	0.006
	25 and above	97	83.2		90.1		31.9	
Undergraduate Category	Pre -clinical	122	86	0.188	88.8	0.026	31.3	0.636
	Clinical	124	83		90		31.4	
Race	Sinhalese	205	84.7	0.156	90.5	0.296	31.5	0.01
	Tamils	28	84.6		87.5		28.7	
	Sri Lankan Moor	13	80.7		85.8		35.1	
Socio Economic Status	Low	63	82	0.099	88.7	0.319	32.3	0.431
	High	83	85.3		90.2		31.1	

Table 4: Attitude statements, the percentage of agreement and the significances.

Statement	Percentage of agreement	p values by categories				
		Gender	Age category	Undergraduate category	Race	Socio economic status
COVID 19 has affected my studies negatively	87.4%	0.45	0.82	0.41	0.81	0.20
I need more education about COVID-19	65.4%	0.91	0.07	0.16	0.30	0.75
I am willing to undergo an infection control training in dentistry for COVID-19	74.4%	0.06	0.63	0.36	0.11	0.02
Current standard of infection control measures in the Dental faculty are at a satisfactory level in preventing the spread of COVID-19	75.6%	0.23	0.61	0.56	0.89	0.21
I would have no objection to get quarantined if needed, while other colleagues are continuing the study program	54.7%	0.94	0.91	0.036	0.87	0.56

Table 5: Attitude and fear scores of clinical group and comparison of positive attitude and fear scores between male and female clinical students

	Mean – Total clinical group	Gender	N	Mean	p value
Fear score clinical	61.2	Male	36	57.22	0.018
		Female	87	62.84	
		Total	123		
Positive attitude	80.4	Male	36	82.08	0.338
		Female	87	79.77	
		Total	123		

Table 6: The significant correlations

		Correlation coefficient	p value
Knowledge	Fear	-0.112	0.03
Fear	Practice	-0.116	0.02
SES	Practice	0.108	0.021
SES	Fear	-0.153	0.001

aspects of the disease, having virtuous attitudes and engage in healthy practices if satisfactory graduate programme inclusive of hands on patients care is to be provided. In addition, they need to be responsible both within the clinical environment and outside of it to minimize the spread of infection. Our findings are supportive of the fact that the dental students' preparedness in terms of knowledge and attitudes is satisfactory to restart the programme including clinical training involving direct patient contact during COVID-19 time.

In spite of the high knowledge scores observed in the present study as opposed to the previous studies^(17–19), it was possible to identify gaps of knowledge which need to be addressed when the faculty is reopened. Since all the students have been vaccinated at the time of writing this paper, lack of knowledge regarding the effects of vaccine might give them a sense of false security leading to non-adherence to precautionary measures especially outside the clinical environment. Further, students should be knowledgeable regarding the testing available and their adequacy in order to screen and triage the patients effectively so that the whole dental team and the other patients treated in the hospital are at a minimal risk. Management protocols should be strictly adhered to and students should be educated whom to contact if a patient is reported positive. Displaying management protocols and important contact numbers would be useful in the new clinical setting.

Our findings are supportive of the fact that the students are having good practices. Considering the cultural implications related to sharing of food items, and taking meals in groups it was obvious that the students do not adhere to guidelines in this regard. Recently concerns regarding the mental health of the students have been discussed in many forums. Virtual activities should be encouraged to ensure the integrity of mental health and fellowship as opposed to physical gatherings and get together.

In the present study, 50.8% of clinical students and 34.6% preclinical students did not want to treat an individual who has had a COVID-19 infection and recovered⁽¹⁵⁾. High fear scores observed in female dental students is par with the previous studies which ascertain the same^(15,18–20).

Negative correlations were observed between knowledge and fear which can be effectively utilized to reduce fear factor among the students. Awareness programmes can be organized to improve the students' awareness regarding COVID-19. Reducing fear will also be helpful to improve practice as shown by our results. Streamlining the triage procedures,

screening patients prior to treatment procedures, adherence to universal precautions and health advisory guidelines and improving the infrastructure facilities in the clinical environment will be important to boost students' confidence and reduce fear.

Majority of 63.5% of the students in clinical years agreed to personally procure extra PPE in contrast to previously reported lack of will by most students to personally procure extra PPE to prevent the spread of COVID-19, when they recommence their clinical procedures in a study done in Nigeria⁽¹⁵⁾. In a country where education and health are provided free of charge, this attitude of students is remarkable if at all additional expenditure incurred upon purchasing of PPE is to limit much required treatment costs for the patients.

Reluctance to undergo testing upon suspected exposure may be due to the uncertainty regarding the quarantine process and subsequent management. Therefore, students should be educated regarding the available facilities within the university premises and reassured.

6 LIMITATIONS OF THE STUDY

Sampling errors could have occurred due to the fact that the sample size might not be adequate to explore the differences between different categories leading to type 1 error. All dental undergraduates have now been vaccinated and the value of the study would have been improved if the questions related to knowledge, attitude and practice of national vaccination program are added.

7 CONCLUSIONS

Students' overall preparedness in terms of knowledge and attitudes is adequate for the management of dental patients during the COVID-19. However, it is recommended to bridge the gaps identified in order to reduce fear and improve practice for safe delivery of oral health care for the community.

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