

Knowledge, attitude and preparedness to combat COVID-19 infection among dental professionals: A student-centric pilot study

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Abstract

Background: In the COVID-19 age, attempts are being made to raise student awareness and improve best practices to contain the outbreak.

Methodology: The target population was interns and 3rd year undergraduate students from JSS Dental College and Hospital, Mysuru. COVID-19 knowledge, awareness and attitude of the students and interns and the preparedness to tackle the current COVID 19 pandemic were assessed.

Results: 120 respondents responded via a contented validated self-administered questionnaire with regard to knowledge, attitude and practices and preparedness to address the COVID 19 pandemic by undergraduates and interns. The student participants irrespective of their years into practice were aware of the guidelines being issued by Health care authorities and to address the COVID 19 pandemic. Among the respondents, 57.5% were 3rd year dental students and 42.5% were interns. Regarding knowledge about COVID infection, 42.9% (3rd year students) and 57.1% of the interns were aware of the recent developments, 34.1% of the III year students were aware of the safe distance to be maintained between patients, 42.4% of the students and 57.6% of interns were aware of the authority to be contacted with suspected COVID 19 infections. The participants were also aware of the vaccine trial which was conducted. Most of the respondents (64.3% of the students and 78.6% of the interns) were aware of fumigation in clinical or high-contact areas on a daily basis and biweekly in nonclinical areas.

Conclusions: The results suggest a strong need to encourage the current training program among students in health care-related fields.

Keywords: Attitude, awareness, COVID-19, knowledge, preparedness

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INTRODUCTION

COVID-19 was first detected in China on November 17, 2019, and has since spread to over 100 countries around

the world, making it a pandemic. On January 30, 2020, the state of Kerala in India reported the first confirmed case

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of coronavirus infection. The people who were harmed had traveled from Wuhan, China.^[1,2] As a result, the Indian government has taken stringent measures to prevent this from happening again. One of the major challenges of these measures is to raise social awareness among various communities, as this has proven to be an important factor in disease prevention. Given the current situation, it is critical to assess the level of awareness among Indians of the current global consequences and precautions needed to combat the pandemic crisis.

Because dental practitioners are exposed to body fluids such as blood, saliva and a variety of aerosol/droplets during dental procedures, they are at the highest risk of becoming infected. Direct contact with oral fluids, mucus membranes, polluted surfaces/instruments or inhalation of infected persons' aerosol/droplets during dental procedures have been shown to favor disease transmission. Dentists are experiencing psychological distress and anxiety because of working in such an unusual situation. Dentists, among all health professionals, are most likely to contract an infection.^[3,4]

As a result, dental students in training should be more aware of this critical situation and should be familiar with all standard operating practices (SOPs). As a result, the purpose of this study was to assess and measure the current awareness of Coronavirus Disease (COVID-19), as well as attitude and preparedness, among dental interns and undergraduate students studying or practicing at JSS Dental College and Hospital in Mysore during the outbreak period between December 2020 and March 2021.

METHODOLOGY

Subjects and methods

Approval of ethical principles

Before the formal survey, the "Institutional Research Review and Ethics Committee, JSS Dental College and Hospital, JSSAHER," gave their ethical approval to the study protocol and informed consent procedures. On the first page of a Google survey, there was an online informed consent form. The participants were informed about the contents of the questionnaire and are asked to affirm their willingness to participate voluntarily by answering a yes/no question. The participants were guided to complete the self-report questionnaire after responding affirmatively to the question. All answers were kept private.

Setting and population

The survey was prepared in the form of an online form and was sent to 120 potential responders who included

undergraduate students and interns and a total of 120 responders who were willing to participate in the study were included and completed the survey with a response rate of 100%.

The survey included closed-ended questions, partially closed-ended questions and open-ended questions. It was composed of 2 parts. The first part gathered demographic data, such as sex, age and year of studying. The second part consisted of 3 main sections with a total of 26 questions. Section 1 examined the level of knowledge (8 questions), Section 2 assessed the attitude of the respondents (10 questions) and Section 3 assessed preparedness toward treating patients with or suspected of having COVID-19 (8 questions). Statistical analyses were performed using SPSS software, 21.0-version IBM, Chicago, USA.

Sample size

The required sample size for this study was calculated using a Denial equation^[5] where the significance level (alpha) was set to 0.05 and power ($1-\beta$) was set to 0.80. It resulted in a required final sample size of 384 individuals. Therefore, to minimize the errors, the sample size taken for this study was 1000.

Outcome measures

The present study examined the level of awareness and preparedness toward the prevention of COVID-19 using gender, age and education level, as explanatory variables among the participants which included 3rd year undergraduates and interns of JSS Dental College and Hospital, Mysore.

Study tool

The investigators (Dr. M and Dr. A) created a standardized (structured, precoded and validated) questionnaire for this study, which is based on frequently asked questions from the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) official websites.

The multiple-choice questions were created to elicit details about the respondents' interpretation of COVID-19 and their readiness for it. A pilot survey of ten people was conducted first to ensure that the questions elicited adequate responses and that there were no issues with the data entry. We chose to collect data online through a Google survey because conducting a community-based national sampling survey during this critical time was not feasible.

There were three parts to the self-reported questionnaire. The first section was intended to gather background data,

such as demographic characteristics (nationality, age, gender, level of education and occupation). The second section of the survey consisted of questions about COVID-19 knowledge (reliable source of information, symptoms, mode of transmission, incubation period, complications, high-risk population, treatment and preventive measures).

The third section of the survey consisted of questions on how prepared people are to battle COVID-19.

Data collection and analysis

The information was obtained using a random sampling approach and evaluated using the SPSS software. Data were described as frequencies and percentages for categorical variables. In the bivariate analysis, the relation between each item in knowledge and the explanatory variable was investigated using the Chi-square test. To analyze the relationships in the modified study, multivariable logistic regression was computed using each item in knowledge and preparedness as an outcome separately. At $P = 0.05$, differences were deemed to be statistically important.

RESULTS

The data collected were subjected to statistical analysis using SPSS 21.0 (IBM, Chicago, USA). Chi-square analysis was used to analyze statistically significant differences in the response between different groups. Statistical significance was set at $P < 0.05$.

Out of a total of 106 respondents, there were 34 males and 72 females. Among the respondents, 57.5% were 3rd year dental students and 42.5% were interns [Table 1].

The student participants irrespective of their years into practice were aware of the guidelines being issued by health-care authorities and to combat COVID-19 pandemic.

Majority of the respondents, whether 3rd year or interns, demonstrated good knowledge scores regarding knowledge about COVID infection (42.9% of 3rd year students and 57.1% of interns). Nearly 34.1% of 3rd year students

were aware of the safe distance to be maintained between patients in the seating area, whereas interns were more aware of the current knowledge (65.9%).

Nearly 57.1% of the intern respondents and 42.9% of the 3rd year students had knowledge about the age group which is most likely to remain asymptomatic despite being infected and at the same time were aware that elderly population with comorbidities were at higher risk.

31.2% of the III-year students and 68.8% of interns were aware of the maximum viral load in the 2nd week after getting infected. Interns were responding better when questioned regarding the main symptoms when compared to 3rd year students, which were statistically insignificant. Both the groups responded positively when questioned regarding inquiry of patients' travel history and checking body temperature. [Table 2] describes the knowledge score of dental professionals.

Regarding the attitude of the students on deferring the dental treatment, most of them wanted deferring of the dental procedures. The treatment was performed with the usage of N95 masks by both 3rd year students and the interns, and the respondents were aware of the WHO-recommended N95 masks (3rd year – 42.4% and interns – 57.6%) for aerosol-generating procedures. The students followed the universal precautions of infection control for the benefit of the patients and the operator. III-year students were not informed of the usage of rubber dam for prevention of aerosol contamination during this pandemic (91.9%) and around 8.1% of interns were not using rubber dam during operatory procedures. The usage of high-volume suction apparatus was also not taken into consideration by both 3rd year students and interns.

Most of them were following the WHO-recommended hand hygiene procedures for 20–40 s with soap and water. Although most of the respondents were performing the preprocedural mouth rinses between patient consultation, they were unaware of the inefficacy of chlorhexidine and usage of povidone–iodine duration for 30–60 s against coronavirus as a preprocedural rinse.^[6] About 27.9% of the respondents were aware of the number of days an infected individual after becoming asymptomatic can be a carrier. Approximately 58.6% of the 3rd year students and 41.4% of the interns believed that the barrier for dental treatment was the fear of getting infected from the patient or co-worker, and might carry infection to their family members and the dentist himself/herself should pay for the treatment expenditure which would have a huge monetary burden. They also had the fear of getting self-infected or infecting their family members [Table 3].

Table 1: Demographic details of the respondents

Parameters	Correspondents' distribution		χ^2
	3 rd year (%)	Interns (%)	
Year	61 (57.5)	45 (42.5)	
Age			
<20	27 (81.8)	6 (18.2)	13.623
>20	34 (46.6)	39 (53.4)	
Gender			
Male	16 (47.1)	18 (52.9)	15.094
Female	45 (62.5)	27 (37.5)	

Table 2 describes the attitude score of the dental professionals. 56.2% of third-year students and 43.8% of interns were using chlorhexidine antibacterial mouthwash before treatment.

For the students to get prepared for delivering quality treatment following lockdown, 42.4% of the students and 57.6% of the interns were aware of the authority to be contacted while encountering people with suspected COVID-19 infections. The participants were also aware of the vaccine trial which was conducted. Most of the respondents-64.3% of III year students and 78.6% of the interns were aware of the daily basis of fumigation in clinical or high contact areas and biweekly in non-clinical areas. The students were positive concerning educating patients about hand hygiene protocol maintain social distance to prevent the spread of the disease. The students and interns gained information on COVID 19 infections through social media websites and attended a lot of lectures ad discussions conducted by our esteemed College and various other forums to update their knowledge. Almost

all (56.3% of interns and of 43.7% III-year students) respondents were eager to upgrade their practices and include all the necessary precautions in their daily practice after the COVID-19 outbreak [Table 4].

DISCUSSION

In the present study, an attempt has been made to obtain the knowledge, attitude and practices, which need to be implemented by undergraduate 3rd year students and interns on their practices to be adopted post lockdown in treating patients.

According to the CDC, in most dental clinical setups, providing care for patients needing transmission-based precautions is not possible as they are not designed for or equipped to provide this standard of care due to lack of airborne infection isolation rooms or single-patient rooms, a respiratory protection program and N95 respirators.^[7] During this period of the extreme shortage of personal protective equipments (PPEs), controlling exposures to occupational infections is a fundamental method of

Table 2: Respondents' response to questions regarding knowledge on COVID-19

Questions on knowledge practices	Respondents' correct response		χ ²
	Interns (%)	3 rd year students (%)	
Q1. The type of COVID-19 infection	60 (57.1)	45 (42.9)	102.038
Q2. Ideal distance to be maintained between patients (2 meters)	29 (65.9)-2 m	15 (34.1)	48.113
Q3. Elderly patients with chronic disease are high risk for COVID-19 infection	60 (57.1)	45 (42.9)	102.038
Q4. Are you updated with the current CDC or WHO guidelines for cross-infection control regarding COVID-19?	47 (58.8)	33 (41.2)	27.509
Q5. What is the incubation period of the COVID virus?	53 (68.8)	24 (31.2)	81.189
Q6. What are the main symptoms of COVID infection? - cough, shortness of breath, fever fatigue and headache	60 (57.1)	45 (42.9)	102.038
Q7. Are you currently asking every patient's travel history before performing dental treatment?	54 (54.5)	45 (45.5)	79.849
Q8. Are you currently taking every patient's body temperature before performing dental treatment?	56 (55.4)	45 (44.6)	86.943

COVID-19: Coronavirus disease 2019

Table 3: Respondents' response on questions regarding attitude and COVID-19

Questions on the attitude of students on COVID-19	Percentage response		χ ²
	3 rd year (%)	Interns (%)	
Q1 Are you deferring dental treatment of patients showing suspicious symptoms?	53 (61.6) - yes 8 (40.0) - no	33 (38.4) 12 (60.0)	41.094
Q2 Which type of face mask is most effective against COVID-19	42 (42.4%)	57 (57.6%)	172.094
Q3 Do you routinely follow universal precautions of infection control for every patient?	58 (56.3)	45 (43.7)	94.340
Q4 Do you use rubber dam isolation for every patient?	34 (91.9)	3 (8.1)	9.660
Q5 Do You Use High-Volume Suction in Your Practice for Every Patient?	39 (76.5%) No	12 (23.5%)-No	0. 0.151
Q6 Do you ask every patient to rinse his/her mouth with anti-bacterial mouthwash before treatment?	52 (55.3)	42 (44.7)	63.434
Q7 Do You Ask Every Patient to Rinse His/Her Mouth with Anti-Bacterial Mouthwash before Treatment? Which one Chlorhexidine or povidone iodine?	50 (56.2)	39 (43.8)	63.434
Q8 Duration of washing hands with soap and water (20-40 s)	37 (75.5)	12 (24.5)	11.113
Q9 Which one on your opinion is the perceived barrier for practicing dentistry during the pandemic? Getting infected with COVID-19 from a patient and co-worker Might carry the infection back to your family Huge monetary investment to continue the safe dental practice All of the above	51 (58.6)	36 (41.4)	186.075
Q 10. Are you afraid of self-infecting or infecting family members or infecting high-risk group people during the COVID-19 pandemic?	55 (64.7)	30 (35.3)	186.075

COVID-19: Coronavirus disease 2019

Table 4: Respondents' response on questions regarding preparedness for COVID 19

Questions on the preparedness of students for COVID-19	Interns	3 rd year	χ^2
Q1 Are you aware of which authority to contact if you come across a patient with suspected COVID-19 infection?	57 (57.6)	42 (42.4)	38.642
Q2 Are you aware of vaccine trials being carried out	58 (56.3)	45 (43.7)	94.340
Q3 How often is fumigation done of the dental operatory? Daily basis in clinical or high-contact areas Biweekly in nonclinical or low-contact areas	44 (78.6)	27 (64.3)	94.340
Q4 There is no effective curative treatment for COVID 19	37 (63.8)	21 (36.2)	21.868
Q5 Educating people (such as washing hands with soap and water or social distancing) about COVID-19 is important to prevent the spread of the disease	61 (57.5)	45 (42.5)	
Q6 Source of information for COVID-19 mass: media, internet and social media, scientific website and article and friends and relatives	25 (58.1)	18 (41.9)	140.226
Q7 Have you attended any lecture/discussions regarding COVID-19?	47 (58.8)	33 (41.2)	27.509
Q8 According to you is there a need for extensive research regarding the prevention, management and treatment of COVID-19 or will it resolve with time as other diseases	58 (56.3)	45 (43.7)	94.340

COVID-19: Coronavirus disease 2019

protecting health-care professionals and preventing its spread.

In the present study, it is promising to know that irrespective of their qualification (graduate/students), the respondents were aware of the advisory issued by various dental associations, and the majority of the clinical practices were shut following the advisory issued by the government and dental associations.

To provide the best treatment, oral health-care professionals were engaged in teleconsultation and elective emergency care with limited resources. The majority had the knowledge regarding the efficacy of general disinfectants for clinical settings and the safest method to treat without producing aerosols, but at the same time, almost one-third of the respondents were not aware of the lack of efficacy of chlorhexidine as preprocedural rinse against novel coronavirus,^[6] which requires constant reminders for the students and doctors to keep themselves well equipped to protect patients and themselves.

The majority of the respondents were clear about the timeline of the maximum viral load after getting infected and also on aspects about the novel coronavirus infectivity and age groups for the most asymptomatic patients. According to a study conducted by De Chang *et al.*, half of the patients that were treated for COVID-19 infection kept shedding the virus for up to 8 days after symptom disappearance, requiring 2 weeks of extended quarantine even after symptomatic recovery.^[8] Shen *et al.* mentioned in their experts' consensus statement regarding diagnosis, treatment and prevention of novel coronavirus infection that children up to 17 years mostly were found to be asymptomatic or had mild symptoms with a good prognosis.^[9]

It could be implied that the knowledge of appropriate personal protective measures and time taken to upgrade the

operatory requires one-to-one training of the students so that they will be well equipped about doffing and donning of the PPE and safe disposal.

As most of the respondents were of the perceived opinion that they fear getting self-infected on spreading to their family members, it was reassuring to see that a large majority of students have the opportunity to get vaccinated which would avoid unnecessary chaos. Majority of the respondents understood the importance of N95 face masks, protective eyewear, protective outerwear and face shields, high-volume evacuation and negative pressure or airborne infection isolation rooms for treating patients during such outbreaks.

Health-care providers should have a sound understanding of aerosol-generating procedures and aerosol-free procedures. The respondents seemed to be highly motivated by the institutional webinars and lectures organized by our institution and educating them regarding the functioning of the dental operatory setup, including visual alert posters, cough etiquettes, hand hygiene protocol, alcohol-based hand rub at the entrance, modification of the existing patient waiting area to allow 1–2 m of social distancing, presence of high efficiency particulate air HEPA filters, nonoverlapping appointments, providing surgical masks to each patient at the entrance and discouraging patient escorts. It was encouraging to see that dental students and interns have established their scientific knowledge and are eager to provide evidence-based oral health care to the community. Amid the ongoing health crisis, the government of Karnataka has permitted health-care providers including dental professions to provide their services.

In the present study, most of the participants had shown the right practices to avoid the spread of COVID-19. This may be due to vast broadcasting about COVID-19 by the

government of India and continuous education given by webinars conducted by the health-care institutions and good knowledge of the respondents, continuous circulation of messages from the health department and educational videos and posts on social media during the current pandemic.

CONCLUSIONS

The current study strongly suggests that educational institutions provide interim regulations in the form of mandatory online CDE (Continuing Dental Education) programs and training, as well as recommendations that are continually updated. With continuous reminders to the students, it is necessary to educate them on the right use of PPE donning and doffing practices, as well as proper disposal. To face the challenge provided by the novel COVID-19 to humanity, a high-level research committee may discuss and submit a thorough strategy to the authorities relating to required research, knowledge flow, patient education and types of equipment. Not only will this prevent the transmission or acquisition of novel viruses while delivering dental care to patients, but it will also safeguard dental practitioners, patients and dental teams from the growing threat of emerging novel viruses and pandemics. We concluded from the research that oral health-care professionals have risen to the occasion with a desire to serve the community, attempting to gain the most up-to-date knowledge of research, studies and conditions while also being concerned about their patients' needs.

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Conflicts of interest

There are no conflicts of interest.

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