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Primary care

Knowledge, attitude and practice of dental students and practitioners during the early days of COVID-19 pandemic in India: A cross-sectional study

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Abstract

Aim: The novel coronavirus disease-2019 (COVID-19) is a major health problem and has affected innumerable people around the world. The current online-based study was conducted to assess the knowledge, attitude and practice (KAP) of dental students and professionals during the early days of lockdown in India from 2 April to 1 May 2020.

Methodology: An online-based cross-sectional study was undertaken through WhatsApp messenger and e-mail groups among dental students and professionals. The KAP on COVID-19 was ascertained using an investigator designed and validated questionnaire. The results were stratified based on student vs professionals. The data were expressed as frequency and percentage analysed using the chi-square/Fishers exact test using IBM version 17. A probability value of <.05 was considered significant.

Results: A total of 287 complete responses from the dental students and professionals were received. The results indicated that the knowledge of both dental students and professionals were good and that the attitude and practice were in accordance with good clinical practice. No significant differences were found within the domains of KAP scores among the dental students and practitioners indicating that the study participants were abreast with the recent advances.

Conclusion: The results of this study conducted during the early stage of the lockdown indicated that the dental students and professionals who had filled the questionnaire had very good knowledge of coronavirus and COVID-19.

Clinical implications: The results of the study indicate that the volunteers had good knowledge, attitude and self-care practice, which are necessary in preventing the spread of COVID-19. It is anticipated that detailed hands-on training in practical aspects of good clinical practice with protective gears will help students and professionals perform the necessary dental procedures in accordance with the guidelines set by Centers for Disease Control and Prevention and World Health Organization.

1 | INTRODUCTION

The outbreak of COVID-19 illness caused by the new Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) belonging to the family Coronaviridae of the order Nidovirales is arguably the biggest pandemic of this century.^{1,2} The zoonotic infection that started in the city of Wuhan, China in December 2019 spread across the world rapidly in a short span of time.^{3,4} Very soon it became clear that idiopathic pneumonia caused by SARS-CoV-2 was transmissible from human to human and on 30 January 2020, the World Health Organization (WHO) declared that it as a Public Health Emergency of International Concern.⁵ Subsequently on 11 February 2020, WHO officially named it as COVID-19.⁵ In the recent past, two other strains of coronavirus have had caused similar outbreaks, the Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-1) in 2002-2003 in China and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in 2012 in China and Saudi Arabia.⁶

The virion of coronavirus is spherical in shape and is made up of outer lipid layer and a crown of club-shaped peplomers or spikes, with single-stranded RNA as their genetic material.⁷ On a comparative note, structurally the SARS-CoV-2 is very similar to SARS-CoV but differs in the vital spike protein(s).⁶ These viruses are ubiquitous in nature and found in a range of mammals and avian species and depending on the strain and host are reported to affect the respiratory, gastrointestinal and central nervous system of the host.⁸ The virus spreads principally through environmental contamination and being in close contact with an affected person or a carrier, touching an infected person or a contaminated surface, and inhaling of respiratory droplets containing the virions are important means of transmission.⁹ In lieu of these observations, the WHO has advocated the use of face masks, social/physical distancing and hand hygiene to be effective in avoiding exposure to virus.¹⁰

The respiratory illness inflicted by COVID-19 has affected unprecedented number of individuals and has severely affected the health of millions of people in almost all countries in the five continents.¹⁰ In terms of death, as of 16 August 2021, COVID-19 has affected 208 705 980 individuals and 4 383 786 have succumbed to the disease.¹¹ This number is more than that caused by any flu pandemics in the history of mankind² and with the incidence and the development of new variants being reported the COVID associate seems to continue for a considerable period in the near future. Worse, at the global level the pandemic is not fully controlled and the colossal numbers of daily infection, admission to hospitals and deaths getting reported across the world is significant.¹² When compared with most seasonal influenza viruses, the infection fatality rate of COVID-19 was high (1%) and a matter of concern in the public and healthcare fraternity.¹³

In humans, the pathogenesis of the coronavirus depends on the virulence factor of the virus and the immunity and health status of the host.⁸ The most important aspect is that COVID-19 can affect and kill healthy adults depending on the virulence factor of the virus and delay in seeking timely medical care.^{9,14} However, reports affirm that it is extremely severe on the elderly and people with existing

What's known

COVID-19 has affected the clinical practice of dental students as well as practitioners which made them reluctant to treat patients.

What's new

To know and increase dentists' knowledge and prevention practices and their contribution at a population level in disease control and prevention.

health problems, such as metabolic syndromes, tuberculosis, HIV, cancer, chronic liver diseases, chronic lung diseases and chronic kidney diseases, are at high risk.^{9,14} The incubation period of the disease ranges from 5 to 14 days during which symptoms may not be detected.¹⁴

Clinically, the symptoms usually appear when the infection has spread to the lower part of the respiratory tract and the development of pneumonia that may be mild to severe. When the infection is mild, the patients normally present with fever, dry cough, lymphopenia, diarrhoea, myalgia or fatigue, sputum production and headache as symptoms.¹⁴ However, when the infection is severe and mostly when unattended patients, the disease worsen and features such as hypoxemia, septic shock, hemoptysis and acute respiratory distress syndrome (ARDS) because of damage to alveolar system may be seen.¹⁵ The severe respiratory distress can increase hypertension, cardiovascular risk, multiorgan failure and all these factors can lead to death of the individual.^{14,15}

When compared with the general people who are restricted to home because of lockdown, healthcare workers working in the front lines such as the physicians, nurses, physiotherapists, pharmacists, technologists working in laboratory and radiology setup in a hospital are at increased risk to get infected.¹⁶ When compared with other healthcare professionals the dentists are not involved in the care of people affected by the SARS-CoV-2 virus during the outbreak of the pandemic.^{17,18} However, a dentist professional duty is at very high risk to get infected principally because of the nature of procedures that involve aerosol production, handling of sharp instruments and dentist's proximity to the oropharyngeal area of the patient.¹⁸

The generation of aerosols is a major risk factor as it increases the chances of acquiring infection from the micro-droplets of an infected patient and also favours cross-transmission.¹⁷ In lieu of these observations a dental clinic is a more dangerous place to spread the virus between professionals or individuals.¹⁸ Dentists should be aware of the biology and transmission of infectious diseases that can affect them and their patient and ascertaining this is important from the purview of dental education. The present study was undertaken with dental students and practitioners to understand the knowledge, attitude and practices (KAP) of dental professionals towards COVID-19 during the early days of lockdown in India.

2 | MATERIALS AND METHODS

The study was submitted online to the secretary of the research ethics committee of the institution to ensure the ethics committee procedure. It was specified that the study would be anonymous and that no personal details (such as e-mail, address, telephone number, name, designation, caste, etc) were required. The ethics committee members had an online meeting and decided to approve the study considering the need, suitability of the study and ethical issues if any in accordance with the standard operating procedure (ABSMIDS/142/2021).

This was a cross-sectional survey dedicated to study the KAP of dental students and professionals and conducted from 2 April 2020 to 29 April 2020 during the COVID-19 lockdown in India through an online survey. The questionnaire was structured in English, and the content was validated by microbiology and public health experts. Subsequently, the questionnaire was formatted in Google forms, an internet-based software commonly used for data collection via personalised survey. This was preferred for its convenience, efficiency and high popularity especially in the current scenario where all educational institutions of the country were closed by the government as a part of the lockdown. After formatting the questionnaire in Google forms, a link was generated for the same and randomly distributed online among dental students and professionals.

Prior to the initiation of the study, the questionnaire design, validation and strategies to recruit the dental students and professionals for maximal participation were telephonically discussed by the investigators because of lockdown being enforced in India. The inclusion criteria followed was that the participants had to be dental students/practitioners regardless of their specialisation in

dentistry, living in India, have an active WhatsApp or e-mail account and who consented to be a part of the study. The exclusion criteria consisted of people from healthcare professionals, such as medical, nursing and allied health sciences; the general public, candidates who gave incomplete data and those not consenting, were excluded from the study. The study intent was communicated to all qualifying participants and the informed consent was labelled obligatory in the questionnaire.

2.1 | Questionnaire components and assessment

The main instrument to collect data was an online questionnaire in Google forms. On clicking the link, the volunteer was directed to a page that comprised the need for the study and informed consent. The participants were informed that their participation was voluntary and that the information provided by them would be confidential with only the principal investigator having access to the data. The volunteers were informed that no personal details (such as e-mail, address, telephone number, name, etc) were required and their consent to be a part of the study in accordance with the inclusion criteria and to affirm it by clicking yes. It was also informed that they had freedom to either accept or decline answering the questionnaire and at any point in the subsequent sheets.

The online questionnaire was composed of four different parts. The first part included demographic data of the participants (sex, age, education level, and work experience). The second was knowledge part, which included questions on virology, transmission and pathogenesis, and safety practices to be followed while treating COVID-19 patients. The third part included the belief and attitude

TABLE 1 Demographic details between the two groups

Categories	N	Dental students and staff		Chi square P value
		Students (N = 193)	Staff (N = 94)	
Gender				
Female	194 (67.6)	130 (67.4)	64 (68.1)	0.015
Male	93 (32.4)	63 (32.6)	30 (31.9)	.902
Marital status				
Single	259 (90.2)	192 (99.5)	67 (71.3)	57.118
Married	28 (9.8)	1 (0.5)	27 (28.7)	<.001
Age				
18-20 y	39 (13.6)	39 (20.2)	0 (0)	278.07
21-26 y	156 (54.4)	154 (79.8)	2 (2.1)	<.001
27-30 y	66 (23)	0 (0)	66 (70.2)	
Above 30 y	26 (9.1)	0 (0)	26 (27.7)	
Place				
Village	95 (33.1)	62 (32.1)	33 (35.1)	8.204
Town	32 (11.1)	15 (7.8)	17 (18.1)	.017
City	160 (55.7)	116 (60.1)	44 (46.8)	

Note: $P \leq .05$ is statistically significant (in bold).

towards the risk of getting infected and transmitting COVID-19 among the volunteers. The final part was on opinion about various methods of prevention and treatment of COVID-19.

2.2 | Statistical analysis

Data retrieved from the online survey was saved in Microsoft Excel 2013 and then imported into Social Sciences (SPSS) version 17 (IBM Corporation, New York, NY, USA). Output measures were presented as frequency (n) and percentage (%). The data were stratified based on whether dental students or practitioners and data were subjected to chi-square test. A probability value of $\leq .05$ was considered statistically significant.

3 | RESULTS

A total of 287 responses were received from the dental students and professionals. Among them, the most volunteers were females 67.6% (194/287), single/unmarried 90.2% (259/287) and younger than 30 years of age [54.4% (156/287)]. There was a statistically significant difference in the number of married individuals and in age between the students and staff (Table 1). With regard to the subject details, an overwhelming 99.7% (286/287) were aware of the COVID-19 situation prevailing in the world and in India almost 75.6% (217/287) of them expressed that they had complete information on the infection and its causes (Table 2). Majority of the participants 89.9% (258/287) expressed that the disease is preventable and there is high risk of getting infected if people avoid wearing masks (92%).

TABLE 2 Answers expressed by the volunteers regarding updating of self on the coronavirus, awareness about the spread and opinion on the efforts of the government in controlling the pandemic

Variables	Options	Total	Qualification N (%)		P value
			Students	Practitioners	
How do you update yourself about coronavirus?	Telemedia	232 (80.8)	154 (53.7)	78 (27.2)	.83
	Friends and relatives	9 (3.1)	6 (2.1)	3 (1)	
	Healthcare workers	16 (5.6)	12 (4.2)	4 (1.4)	
	WhatsApp	14 (4.9)	11 (3.8)	3 (1)	
	Other	16 (5.6)	10 (3.5)	6 (2.1)	
I am of scared of coronavirus because	It is a deadly disease	3 (1)	2 (0.7)	1 (0.3)	.775
	Anyone can be affected	67 (23.3)	48 (16.7)	19 (6.6)	
	No vaccine	55 (19.2)	38 (13.2)	17 (5.9)	
	All of the above	162 (56.4)	105 (36.6)	57 (19.9)	
Are of aware of the current situation of coronavirus infection in the world?	Yes	286 (99.7)	192 (66.9)	94 (32.8)	.48
	No	1 (0.3)	1 (0.3)	0 (0)	
Do you feel that you know enough about the coronavirus and the disease it causes?	Yes	217 (75.6)	150 (52.3)	67 (23.3)	.23
	No	70 (24.4)	43 (15)	27 (9.4)	
I believe there is currently a high risk of coronavirus infection if we go for shopping without masks	Yes	264 (92)	178 (62)	86 (30)	.83
	No	23 (8)	15 (5.2)	8 (2.8)	
In my opinion, this coronavirus outbreak is going to continue for a long time	Yes	249 (86.8)	168 (58.5)	81 (28.2)	.84
	No	38 (13.2)	25 (8.7)	13 (4.5)	
Do you feel the government has taken enough steps to prevent the spread of the disease?	Yes	223 (77.7)	149 (51.9)	74 (25.8)	.77
	No	64 (22.3)	44 (15.3)	20 (7)	
I think that the government and media have over-exaggerated the risks of coronavirus infection?	Yes	64 (22.3)	43 (15)	21 (7.3)	.99
	No	223 (77.7)	150 (52.3)	73 (25.4)	
Coronavirus outbreak is getting unnecessary attention currently?	Yes	34 (11.8)	26 (9.1)	8 (2.8)	.22
	No	253 (88.2)	167 (58.2)	86 (30)	
Do you agree that coronavirus will finally be controlled?	True	243 (84.7)	165 (57.5)	78 (27.2)	.825
	False	10 (3.5)	6 (2.1)	4 (1.4)	
	I don't know	34 (11.8)	22 (7.7)	12 (4.2)	
Do you have confidence that the world can win the battle against coronavirus?	Yes	275 (95.8)	184 (64.1)	91 (31.7)	.559
	No	12 (4.2)	9 (3.1)	3 (1)	
Do you have confidence that India can win the battle against coronavirus?	Yes	274 (95.5)	182 (63.4)	92 (32.1)	.172
	No	13 (4.5)	11 (3.8)	2 (0.7)	

TABLE 3 Knowledge of coronavirus and COVID-19 among the dental students and practitioners who participated in the study

Variables	Options	Total	Qualification N (%)		P value
			Students	Practitioners	
Do all people infected with coronavirus die?	Yes	4 (1.4)	3 (1)	1 (0.3)	.74
	No	283 (98.6)	190 (66.2)	93 (32.4)	
Is the disease caused by coronavirus preventable?	Yes	258 (89.9)	172 (59.9)	86 (30)	.53
	No	29 (10.1)	21 (7.3)	8 (2.8)	
Coronavirus was first reported in Wuhan City of	Japan	6 (2.1)	5 (1.7)	1 (0.3)	.544
	India	1 (0.3)	1 (0.3)	0 (0)	
	China	280 (97.6)	187 (65.2)	93 (32.4)	
	Singapore	0 (0)	0 (0)	0 (0)	
The route of entry of coronavirus is through all except	Nose	24 (8.4)	19 (6.6)	5 (1.7)	.035*
	Mouth	10 (3.5)	8 (2.8)	2 (0.7)	
	Eyes	36 (12.5)	30 (10.5)	6 (2.1)	
	Skin	217 (75.6)	136 (47.4)	81 (28.2)	
The most common organ involved in severe coronavirus is	Liver	1 (0.3)	1 (0.3)	0 (0)	.629
	Lungs	282 (98.3)	187 (65.9)	93 (32.4)	
	Kidneys	2 (0.7)	1 (0.3)	1 (0.3)	
	Brain	2 (0.7)	2 (0.7)	0 (0)	
The main symptoms of coronavirus infection are fever, tiredness, dry cough and body ache	True	279 (97.2)	187 (65.2)	92 (32.1)	.452
	False	5 (1.7)	3 (1)	2 (0.7)	
	I don't know	3 (1)	3 (1)	0 (0)	
Currently, there is no effective cure for COVID-19, but early medical care can help most patients recover from the infection	True	269 (93.7)	184 (64.1)	85 (29.6)	.132
	False	4 (1.4)	1 (0.3)	3 (1)	
	I don't know	14 (4.9)	8 (2.8)	6 (2.1)	
In most cases, the aged, people having chronic illnesses (such as diabetes, hypertension, etc) are more likely to be severely affected	True	278 (96.9)	187 (65.2)	91 (31.7)	.999
	False	3 (1)	2 (0.7)	1 (0.3)	
	I don't know	6 (2.1)	4 (1.4)	2 (0.7)	
The coronavirus spreads via respiratory droplets of infected individuals	True	278 (96.9)	186 (64.8)	92 (32.1)	.478
	False	6 (2.1)	4 (1.4)	2 (0.7)	
	I don't know	3 (1)	3 (1)	0 (0)	
Common people can wear general medical masks to prevent the infection by coronavirus	True	228 (79.4)	149 (51.9)	79 (27.5)	.276
	False	46 (16)	33 (11.5)	13 (4.5)	
	I don't know	13 (4.5)	11 (3.8)	2 (0.7)	
It is necessary for children and young adults to take precautions to prevent the coronavirus infection	True	283 (98.6)	191 (66.6)	94 (32.1)	.357
	False	1 (0.3)	1 (0.3)	0 (0)	
	I don't know	3 (1)	1 (0.3)	2 (0.7)	
To prevent the infection by coronavirus, individuals should avoid/minimise/reduce going to crowded places such as market	True	286 (99.7)	192 (66.9)	94 (32.8)	.484
	False	0 (0)	0 (0)	0 (0)	
	I don't know	1 (0.3)	1 (0.3)	0 (0)	
Isolation and immediate medical treatment of people who are infected with the coronavirus are effective ways to reduce the spread of the virus	True	285 (99.3)	192 (66.9)	93 (32.4)	.281
	False	1 (0.3)	0 (0)	1 (0.3)	
	I don't know	1 (0.3)	1 (0.3)	0 (0)	
People who have been in contact with a person infected with the coronavirus should be immediately isolated in a safe place for 14 d	True	283 (98.6)	190 (66.2)	93 (32.4)	.536
	False	2 (0.7)	1 (0.3)	1 (0.3)	
	I don't know	2 (0.7)	2 (0.7)	0 (0)	

(Continues)

TABLE 3 (Continued)

Variables	Options	Total	Qualification N (%)		P value
			Students	Practitioners	
COVID-19 is thought to be originated from the wild bats	True	171 (59.6)	111 (38.7)	60 (20.9)	.340
	False	32 (11.1)	25 (8.7)	7 (2.4)	
	I don't know	84 (29.3)	57 (19.9)	27 (9.4)	
An individual with COVID-19 can transmit the virus to other individuals after only having or developing fever	True	30 (10.5)	18 (6.3)	12 (4.2)	.670
	False	226 (78.7)	154 (53.7)	72 (25.1)	
	I don't know	31 (10.8)	21 (7.3)	10 (3.5)	
Eating wild animal meat (bush meat) can result in the infection by organisms	True	130 (45.3)	86 (30)	44 (15.3)	.925
	False	58 (20.2)	40 (13.9)	18 (6.3)	
	I don't know	99 (34.5)	67 (23.3)	32 (11.1)	

* $P \leq .05$.

Also, in people's opinion the virus is going to last for a long time (77.7%) (Table 2).

In the domain that addressed understanding the knowledge of the participants on the biology of the virus and its pathogenesis, it was observed that for majority of the questions the volunteers answered the questions correctly by all groups of volunteers (Table 3). With regard to the question on the mode of transmission of SARS-CoV-2 in community, 77.5% of the volunteers answered correctly that it does not spread through skin with a significance of $P = .035$ (Table 3). With regard to the questions on the symptoms, most of the participants answered correctly (93.7%) (Table 3). Majority of the volunteers (96.9%) answered people with chronic illness such as hypertension, bronchial asthma and diabetes mellitus and aged people are at high risk (Table 3). Also 96.9% of participants correctly answered about the spread of infection through droplets and the origin is from bats (59.6%) (Table 3). Additionally, 98.6% of participants emphasised on preventive measures to combat infection, and 99.7% believed that avoiding crowded places and isolation of person who is a primary contact (98.6%) would limit the spread of infection (Table 3).

With regard to the domain on attitude towards COVID-19, majority of the participants have a positive attitude towards the infection. 84.7% of people believed that this situation can be brought under control and 95.8% have the confidence of winning against pandemic (Table 4). Although dental professionals are at risk majority believe that vaccine is the best way to prevent infection (35.9%) (Table 4). With regard to questions addressing opinion on prevention and prophylaxis measures, preventive measures such as quarantine, hand washing and wearing face masks were agreed by 68.3%, 51.4% and 48.1% of the volunteers, respectively (Table 4). The opinions on preventive medication, practicing doctors agreed that gargling of mouth with salt water is the best way to prevent coronavirus infection (30%) (Table 4). Similarly, most of the participants (38%) were unsure about Ayurvedic drugs for treatment purposes. For safety measures, participants agree that they never leave the house without a mask (96.2%), deliberately cancelled social events and functions (97.2%), reduced the shopping time (98.6%), cleaned or disinfected doorknobs, call bells and common landline phones

(80.5%), washed hands with soap and water more often than usual (98.3%), kept slippers and shoes outside the house after returning from market/outside (86.1%) and 95.1% of participants after returning home from market/outside, directly go and wash thier hands and then took a bath (Table 4).

When chi-square test was used to compare the demographic data as well subject-specific questions such as participants in private practice and students, there was no significant difference in both except few categories such as the route of entry which was answered correctly by students with $P = .035$ (Table 4). Other ways of contacting infection such as rear animals were answered mostly by student category with a significant difference of $P = .027$. There was a positive attitude with COVID affecting the health if contact of the virus happens with significance of $P = .015$ (Table 4).

4 | DISCUSSION

The outbreak of COVID-19 pandemic has created a lot of apprehension and fear in healthcare professionals who are at increased risk to get infected in the line of duty. Under these circumstances, awareness regarding the pathogen and ways of preventing infection is vital in safeguarding self while managing asymptomatic people. Dentistry is an important stream of healthcare and although not in the forefront of COVID care, dental professionals have a very important role in society. Knowledge, attitudes, perception and preventative practices are very important in healthcare professionals as they help in adopting and practicing safety guidelines for the betterment of the professional as well as to the patient they are attending to. Considering this the current study attempt was made at understanding the knowledge, belief, attitude and opinion of the virion, the aetiopathogenesis disease and prevention were assessed in dental students and professionals.

The results of the study clearly indicated that the knowledge on viral pathogenesis and safety practices was high in the participants irrespective of whether they were students or professionals. The possible reason for this is that majority of the participants 80.8%

TABLE 4 Practice of personal hygiene and opinion on the use of preventive prophylaxis/medication by the volunteers who participated in the study

Variables	Options	Total	Qualification N (%)		P value
			Students	Practitioners	
In the last month when you suddenly felt, such as sneezing, where did you sneeze?	In to your hands	69 (24)	48 (16.7)	21 (7.3)	.299
	In to open air	5 (1.7)	4 (1.4)	1 (0.3)	
	In to a cloth	121 (42.2)	86 (30)	35 (12.2)	
	In to shoulders	92 (32.1)	55 (19.2)	37 (12.9)	
If you were infected by coronavirus, how seriously do you think it would affect your health?	Not at all	8 (2.8)	6 (2.1)	2 (0.7)	.362
	Somewhat	131 (45.6)	82 (28.6)	49 (17.1)	
	Very seriously	89 (31)	67 (23.3)	22 (7.7)	
	Extremely	22 (7.7)	14 (4.9)	8 (2.8)	
	Don't know	37 (12.9)	24 (8.4)	13 (4.5)	
Please indicate your level of risk of being infected by coronavirus	Very high	20 (7)	8 (2.8)	12 (4.2)	.015 ^a
	High	44 (15.3)	28 (9.8)	16 (5.6)	
	Medium	85 (29.6)	59 (20.6)	26 (9.1)	
	Low	64 (22.3)	44 (15.3)	20 (7)	
	Very low	50 (17.4)	41 (14.3)	9 (3.1)	
	Don't know	24 (8.4)	13 (4.5)	11 (3.8)	
Do you think vaccine is the best way to prevent coronavirus infection?	Strongly yes	93 (32.4)	57 (19.9)	36 (12.5)	.13
	Yes	103 (35.9)	66 (23)	37 (12.9)	
	Unsure	71 (24.7)	53 (18.5)	18 (6.3)	
	No	16 (5.6)	13 (4.5)	3 (1)	
	Strongly no	4 (1.4)	4 (1.4)	0 (0)	
Do you think being at home (or quarantine) is the best way to prevent coronavirus infection?	Strongly yes	196 (68.3)	136 (47.4)	60 (20.9)	.134
	Yes	73 (25.4)	45 (15.7)	28 (9.8)	
	Unsure	13 (4.5)	9 (3.1)	4 (1.4)	
	No	3 (1)	3 (1)	0 (0)	
	Strongly no	2 (0.7)	0 (0)	2 (0.7)	
Do you think hand washing is the best way to prevent coronavirus infection?	Strongly yes	148 (51.6)	96 (33.4)	52 (18.1)	.063
	Yes	124 (43.2)	90 (31.4)	34 (11.8)	
	Unsure	10 (3.5)	6 (2.1)	4 (1.4)	
	No	5 (1.7)	1 (0.3)	4 (1.4)	
	Strongly no	0 (0)	0 (0)	0 (0)	
Do you think wearing a face mask is the best way to prevent coronavirus infection?	Strongly yes	113 (39.4)	72 (25.1)	41 (14.3)	.35
	Yes	138 (48.1)	93 (32.4)	45 (15.7)	
	Unsure	21 (7.3)	18 (6.3)	3 (1)	
	No	14 (4.9)	9 (3.1)	5 (1.7)	
	Strongly no	1 (0.3)	1 (0.3)	0 (0)	
Do you think gargling mouth/throat with salt water is the best way to prevent coronavirus infection?	Strongly yes	48 (16.7)	33 (11.5)	15 (5.2)	.111
	Yes	86 (30)	56 (19.5)	30 (10.5)	
	Unsure	82 (28.6)	63 (22)	19 (6.6)	
	No	58 (20.2)	35 (12.2)	23 (8)	
	Strongly no	13 (4.5)	6 (2.1)	7 (2.4)	
Do you think taking homemade herbal drink or Ayurvedic drugs is the best way to prevent coronavirus infection?	Strongly yes	21 (7.3)	15 (5.2)	6 (2.1)	.697
	Yes	39 (13.6)	25 (8.7)	14 (4.9)	

(Continues)

TABLE 4 (Continued)

Variables	Options	Total	Qualification N (%)		P value
			Students	Practitioners	
	Unsure	109 (38)	77 (26.8)	32 (11.1)	
	No	82 (28.6)	55 (19.2)	27 (9.4)	
	Strongly no	36 (12.5)	21 (7.3)	15 (5.2)	
In recent days, have you worn a mask when leaving home?	Yes	276 (96.2)	189 (65.9)	87 (30.3)	.026*
	No	11 (3.8)	4 (1.4)	7 (2.4)	
In the past 1 mo, have you deliberately cancelled or postponed social events and functions because of the coronavirus?	Yes	279 (97.2)	187 (65.2)	92 (32.1)	.636
	No	8 (2.8)	6 (2.1)	2 (0.7)	
In the past 1 mo, have you reduced the shopping time when you went out of your house?	Yes	283 (98.6)	190 (66.2)	93 (32.4)	.739
	No	4 (1.4)	3 (1)	1 (0.3)	
In the past 1 mo have you cleaned or disinfected doorknobs, call bells and common landline phones?	Yes	231 (80.5)	156 (54.4)	75 (26.1)	.834
	No	56 (19.5)	37 (12.9)	19 (6.6)	
In the past 1 mo, have you washed your hands with soap and water more often than usual?	Yes	282 (98.3)	188 (65.5)	94 (32.8)	.115
	No	5 (1.7)	5 (1.7)	0 (0)	
In the past 24 h, how many times have you washed your hands with soap and water (not including baths, showers, or washing up)?	0-4	83 (28.9)	58 (20.2)	25 (8.7)	.466
	5-9	131 (45.6)	91 (31.7)	40 (13.9)	
	10-14	55 (19.2)	35 (12.2)	20 (7)	
	15-19	7 (2.4)	3 (1)	4 (1.4)	
	More than 20 times	11 (3.8)	6 (2.1)	5 (1.7)	
In the past 1 mo have you kept your slippers and shoes outside the house after coming back from market/outside?	Yes	247 (86.1)	168 (58.5)	79 (27.5)	.49
	No	40 (13.9)	25 (8.7)	15 (5.2)	
In the past 1 mo after coming home from outside did you directly go and wash your hands and took a bath?	Yes	273 (95.1)	186 (64.8)	87 (30.3)	.16
	No	14 (4.9)	7 (2.4)	7 (2.4)	

*P ≤ .05.

expressed that they update themselves about coronavirus through telemedia (Table 1). Previous studies have shown that the internet and associated technologies are powerful medium at delivering information and that greater accessibility to internet in the recent past has helped bridge gaps in existing knowledge.¹⁹ In addition to this, the participants upgraded their knowledge on the aetiopathogenesis of the virus and its spread through scientific endeavours and by attending lectures and seminars on webinar and by listening through pre-recorded video talks uploaded in Youtube and in medical society portals. To substantiate this, recent reports affirm that webinars are very effective in sharing information and that there was an increase in people attending them during the COVID-19 pandemic.²⁰ These observations are not in agreement with previous studies where during the influenza A (H1N1) pandemic in Nigeria television was the primary source of information for healthcare staff.²¹ This could be because of the difference in the availability of the internet facility in Nigeria and the time point of study in 2011 when the internet was not as prevalent as today.

With regard to questions that ascertained the current awareness of the pandemic and the reason for fear, most of the volunteers expressed that they were and apprehensive because the

ailment was deadly, anyone can be affected and non-availability of vaccine (during the early days of pandemic in April 2020) (Table 1). Also majority of the participants felt that coronavirus outbreak was not getting unnecessary attention, the government and media were not over-exaggerated the risks of COVID-19 and that the administration had taken enough steps to prevent the spread of the disease (Table 1). Public perception is an important factor especially when lockdown is imposed in the emergency situation and the response of the participants indicate that they comprehended the gravity of the situation. The other important aspect ascertained was that majority of the volunteers (86.8%) expressed that coronavirus outbreak is going to continue for a long time possibly because being healthcare professionals and having studied microbiology they were aware that virus cannot be completely eradicated and that will continue to exist in society (Table 1).

This section is planned to ascertain the knowledge of coronavirus. SARS-CoV-2 is reported to be a bat virus that got mutated and obtained the capacity to cause human to human transmission.²² The virus spreads principally through droplet and when a person is in close proximity to the patient or a carrier.¹⁰ On inhaling, the droplet reaches the lower respiratory tract and the infected individual does

not display any clinical symptoms during the incubation period. In most cases the symptoms commonly observed are dry cough, low grade fevers, body aches, diarrhoea and dyspnea.¹⁰ When compared with children and young and healthy people, the viral pathogenesis is severe in the elderly people and in patients with underlying morbidities and mortality because of multiorgan failure was common in these people.²³⁻²⁵ It was observed that most of the participants were very well aware of the biology of the viruses, the transmission, pathogenesis and people at high risk and that there was no difference in the answers of dental students and professionals for most questions (Table 2).

Knowledge obtained from previous airborne pandemics has validated that transmission is effectively prevented by social distancing, frequent hand hygiene and wearing a face mask in public. Quarantine of people exposed to confirmed, travel restrictions, school closure and physical distancing are extremely useful in reducing transmission. At individual level, recommended precautions such as frequent and proper hand hygiene with soap and water or with alcohol-based hand rub is proved to be effective.²⁶ Also, wearing of suitable mask by covering the mouth and nose snugly in public is very effective. Also the emergence of COVID-19 has shown a dramatic effect on humans, as both public meetings and social activities are curtailed to limit the transmission rates. In lieu of these observations, it is also important to adopt good clinical practices, such as wearing clean gowns, face mask/N95, goggles face/shield and clean gloves during emergency duties.²⁷

The other important observation was that although no benefit of gargling mouth and throat with salt water or iodine solution is reported, nearly 47% of the volunteers agreed it to be useful and this may have been from their experience in Dentistry where gargling is recommended for good oral health. Nearly 68% of the participants agreed that a vaccine, when available will be very useful in mitigating the pandemic. Also 51% felt that homemade herbal drink or Ayurvedic drugs are the best way to prevent coronavirus infection. In this regard, the use of intake of home-made medication is high in India and in the study this may have had a role in the expression of the usefulness of the practice by the volunteers. Also, reports do suggest that China had approved the use of three herbal medications, the Lianhuaqingwen capsules and Jinhuaqinggan granules for mild conditions, and Xuebijing (injectable) for severe conditions for use in COVID-19 based on laboratory evidence and anecdotal clinical data.²⁸

5 | CONCLUSION

The results of this study showed that dental students and professionals had adequate knowledge on aetiopathology, transmission and prevention of COVID-19. Previous studies have shown that the general practitioners had higher knowledge and support our observation.²⁹ A strong positive attitude and knowledge ratings that are necessary in preventing COVID-19 was also seen. COVID-19 transmission presents a danger to individuals who come into direct contact with an infected person. Additionally, the risk is higher for family

and healthcare staff working in close proximity to the patient. The gap between the field of operation and the dentist is approx. 35-40 cm, with some techniques which can be very time-consuming, which places the dentist at an increased risk of COVID-19 being approached.³⁰ It is anticipated that training with mannequins and dummy models with protective gears will help the students and professionals perform the necessary dental procedures in accordance with the guidelines set by Centers for Disease Control and Prevention and WHO.

DISCLOSURE

The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings are available from the corresponding author (Dr Aditya Shetty) upon reasonable request.

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