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KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS PREVENTION OF COVID-19 AMONG DENTAL HEALTH PROFESSIONALS: A CROSS-SECTIONAL SURVEY

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ABSTRACT

Context: The highly infectious global outbreak of the novel Corona virus disease 2019 (COVID-19) caused by Severe acute respiratory syndrome corona virus-2(SARS- CoV-2) is causing concern world-wide since its emergence. Being a respiratory infection it is a threat to Dental Health Professionals (DHPs) due to the characteristics of dental settings. Therefore it is necessary to explore the knowledge, attitude and practices among dental health professionals (DHPs) in order to prevent the spread of COVID-19. **Aims:** To investigate the knowledge, attitude and practice towards prevention of COVID 19 among DHPs. **Settings and Design:** A web based cross-sectional survey was conducted globally among DHPs. **Methods and Material:** A 25-item survey instrument was developed and distributed among DHPs which required 5 minutes to complete. **Statistical analysis used:** Statistical analyses was done using Statistical Package for Social Sciences [SPSS] for Windows, Version 22.0. (Released 2013. Armonk, NY: IBM Corp. Chi Square test was used to compare the difference in the distribution of responses to the study questionnaire ($p<0.001$). **Results:** A total of 431 DHPs responded, majority of the which agreed that following hand, respiratory hygiene and maintenance of social distancing norms helped in prevention COVID-19 transmission and agreed to be following infection control guidelines. Substantial number of DHPs those who treated patients used personal protective equipment. **Conclusions:** Even though the participants in the study showed satisfactory knowledge and showed positive personal protective practices there is an need for creating awareness and training regarding personal protective equipment and disinfection protocols among the DHPs through reliable means.

KEYWORDS: COVID-19, Dental Health Professionals and Awareness of COVID-19.

INTRODUCTION

The outbreak of the novel Corona virus disease 2019 (COVID-19) which is a contagious disease has rapidly affected almost all countries and causing concern globally since its emergence in Wuhan, China in 2019. It is a viral respiratory disease caused by Severe acute respiratory syndrome coronavirus-2 (SARS- CoV-2) which is a single-stranded RNA virus belonging to the genus Betacoronavirus.[1] The main symptoms of the COVID-19 include fever, cough, breathlessness, headache, myalgia and sore throat.[2] Based on findings of genetic and epidemiologic research, it appears that the COVID-19 outbreak started with a single animal-to-human transmission, followed by sustained human-to-human transmission.[1,3,4] The transmission routes among humans includes direct transmission via droplets during coughing, sneezing etc., feco-oral route or direct contact with the mucosa.[3] Although symptomatic patients of COVID-19 are the main source of transmission recent literature suggests asymptomatic patients also can transmit the disease during the incubation period.[4,5] In addition to these routes of transmission, COVID-19 has been demonstrated in saliva of these patients.[6] Angiotensin-converting enzyme 2(ACE 2) is known to be the functional receptor of COVID-19 which is abundantly found in the respiratory tracts and ducts of salivary glands.[7,8] Due to the characteristics of dental settings, the risk of cross infection is high between dental practitioners and patients owing to frequent exposure to saliva, blood and aerosols produced during the dental procedures.[3,9] Therefore it is necessary to explore the knowledge, attitude and practices among dental health

professionals (DHPs) in order to prevent the spread of COVID-19 either by acquiring the disease themselves or by acting as vectors for the disease. Hence a study was conducted in this regard with the aim to investigate the knowledge, attitude and practice towards prevention of COVID-19 among Dental Health Professionals (DHPs).

SUBJECTS AND METHODS

A web based cross sectional survey was conducted among dental health professionals globally during first week of April, 2020. A 25 item survey instrument was designed covering various domains such as participants' characteristics, awareness, and sources of information, knowledge, attitude and practices towards prevention related to COVID-19. The developed draft survey instrument was pretested on ten randomly selected faculty members to assess its readability, validity, clarity, relevance and acceptability. Modifications were made as required to facilitate better comprehension and to improve the organization of the questions before the final survey was distributed.

The survey instrument comprised of closed-ended questions and took approximately 5 minutes to complete. Participation in this survey was voluntary. An Informed consent was obtained from the study participants. Confidentiality was maintained by not including the participant's personal data in the survey. The study was conducted following the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). The survey was open and a single screen survey. Contact with the participants was made through web via e-mails and social media. No incentives were offered for the participants.

Statistical analysis

Statistical Package for Social Sciences [SPSS] for Windows, Version 22.0. (Released 2013. Armonk, NY: IBM Corp.,) was used to perform statistical analyses. Descriptive analysis included expression of the responses to the study questionnaire in frequency and proportions. Chi Square Goodness of Fit test was used to compare the difference in the distribution of responses to the study questionnaire among the participants. The level of significance [P-Value] was set at $p<0.001$.

RESULTS

A total of 431 dental health professionals responded to the questionnaire which included 244 females (56.6%). The majority of participants were private practitioners (n= 218, 50.6%) with 31.1 % of them were holding a bachelor's degree in dental profession. **Table 1** shows the socio-demographic characteristics of the participants.

Almost all participants agreed that they had heard about COVID-19 (98.1%). Of the 431, participants 412 (95.6%) of the dentists were practising in India and 19 (4.4%) were working in overseas (such as Nepal, USA, Australia, UAE, Malaysia, Tanzania).

Table 1: Distribution of dental health professionals according to their characteristics.

Gender distribution among study participants			
Variable	**Category**	**N**	**%**
Gender	Males	187	43.4%
	Females	244	56.6%
Distribution of study participants based on their designation			
Variable	Category	N	%
Designation	PG Student	130	30.2%
	Private Practitioner	218	50.6%
	Faculty	55	12.8%
	Private Practitioner + Faculty	28	6.5%
Distribution of study participants based on their Specialization			
Variable	Category	N	%
Specialty	Oral Medicine and Radiology	12	2.8%
	Oral Surgery	40	9.3%
	Oral Path	9	2.1%
	Prosthodontics	34	7.9%
	Conservative and Endodontics	46	10.7%
	Periodontics	27	6.3%
	Pedodontics	89	20.6%
	Orthodontics	31	7.2%
	Public Health Dentistry	9	2.1%
	General Dentist	134	31.1%

Source of information

Majority of DHPs gathered information from news and media (87.9%) but only 33.4% of them had the opportunity to attend scientific sessions/ lectures/discussions/webinars about COVID-19.

Knowledge

Table 2 shows the knowledge about COVID-19 among DHPs. A high majority of the DHPs agreed that maintaining hand hygiene (97.2%), covering the nose and mouth while coughing and sneezing (90.5%), and maintenance of social distancing norms (93.5%) help to prevent COVID-19 transmission. However, 3.7% (n=16) of participants incorrectly believed that COVID-19 spreads thorough domesticated pets. The participants' knowledge about questions related to of incubation period of COVID-19 was 98.8% (p<0.001).A majority of the DHPs agreed that COVID-19 could lead to pneumonia (78.7%), respiratory failure (85.2%), and death (80.7%).

Attitude

94.9% of the DHPs agreed that following guidelines put forth by the Centres for Disease Control and World Health Organization to prevent the transmission of COVID-19 in the dental office. However, only 12.1 % (p<0.001) of the DHPs reported that asymptomatic contacts are possible carriers. Active participation and training of DHPs is required to reduce the spread was agreed by 90.0% of the DHPs. All patients who have shown symptoms are to be kept in isolation was agreed by 99.8% of the DHPs.

Practice towards prevention

Over 86.1 % of the participants agreed that they always tested the mouth mask for a good fit prior to examining a patient; 94.7% preferred oral rinse for every patient before a procedure. A high majority of the DHPs agreed that sick patients should share their recent travel history (71.5%), and that disinfection protocol must be stringently followed between each patient. In view of the outbreak, 50.8% of the DHPs were carrying out only emergency procedures. Among those who treated patients during the outbreak 63.1% used personal protective equipment.

DISCUSSION

The outbreak of COVID-19 has become the prime topic of discussion gripping the international community and causing widespread public health concern especially among DHPs. Dental health professionals are among those at highest risk due to proximity with patients; and exposure to blood, saliva and aerosols during the treatment. To the best of our understanding, there are hardly any reports that have examined the DHPs knowledge, attitude and practices towards prevention during the outbreak of COVID-19 in India. In view of this limited literature, the comparison of our findings has been made with other related conditions among DHPs. Overall, DHPs considered in the present study exhibited good knowledge, positive attitude and good precautions in practice. Considering the uniqueness of this novel virus and self-quarantine protocols in place, a web-based survey was designed to maximise the reach to DHPs across the world for better understanding on the knowledge, attitude and practices towards prevention. Although traditional sources of knowledge like news and other media played a significant role in obtaining knowledge on the disease, 60.6% and 53.8% of DHPs depended on World Health Organization and government websites for reliable information on the COVID-19 respectively. This finding emphasizes the use of internet in transmitting correct information to DHPs,[10] but also there is a potential for the development and spread of misinformation or fake news.[1] Relying on authentic sources is a key factor in believing transparent information about the COVID-19 infection and is essential for DHPs' preparedness but 58.9% relied on social media. Under-utilized sources like seminars and availability of research articles could also be employed in a campaign to educate DHPs regarding the novel virus.[11] The findings of this study suggest that DHPs had significant knowledge on COVID-19 but with regards to transmission nearly 4% felt that domesticated pets transmitted the virus. Currently there is no evidence to suggest that COVID-19 cause's illness in pets and they play a significant role in spreading COVID-19 even though certain pets have tested positive for the virus. Due to this misinformation there is fear which has negatively impacted the welfare of pets.[12] A high proportion of the respondents showed sufficient knowledge on the routes of spread, incubation period (98.8%) symptoms, and modes of transmission in dental office and measures of protection. One of the alarming findings in the present study is that only 12.1% of the respondents agreed that asymptomatic patients can also be carriers of the disease. For measles and norovirus infections, it is already well established that asymptomatic individuals are frequently able to transmit the virus to others.[13] There is accumulating evidence indicating that a substantial fraction of infected individuals are asymptomatic and could therefore be carriers.[14,15] The extensive focus on symptoms and prevention may have led to the DHPs overlooking asymptomatic patients as a potential threat for the spread of COVID-19.

The attitude was found to be in the positive regarding the strict adherence to universal precautions while dealing with patients. This finding is in line with another study which showed positive response from the healthcare workers that goggles and gloves should be worn when dealing with healthcare associated infections.[11] Experience from the early phase of COVID-19 pneumonia strongly highlighted that travel history is of paramount importance for early detection and isolation of COVID-19 pneumonia cases.[1] Over 70% of the respondents agreed that a thorough travel history and history of symptoms is necessary before treatment. Similar studies conducted by Kamate et al showed 96.2 % respectively recording travel histories.[16] The COVID-19 outbreaks in parts of the world and the increasing number of DHPs affected are reminders to acquire the basic information of infection control, which is the main principle for protection from COVID-19. Positive practices towards prevention were noted among

the respondents in the present study. With regards to treating patients during the outbreak 46.2% performed only emergency treatments and 4.6% performed routine treatments with 63.1% using personal protective equipment (PPE). Majority of the DHPs took efforts to prevent overcrowding in their dental offices. This attitude is justified by reports of To and Liu et al who stated that salivary gland epithelial cells can be infected by this virus and hence it can be isolated in the saliva.[6,7] Telephonic triaging of patients has also been recommended which can be effective in this regard.[17] Almost half of the respondents in our study performed only emergency procedures. The percentage being stimulating, sparked the curiosity of the investigators leading to further inquiries which revealed the use of tele-dentistry, online consultations or consultation sessions while following the social distancing measures. While routine dental care had been suspended and regulations regarding this were in place in India during the time of conduction of this study, it was not the case in other countries which may have resulted in substantial number of dentists from other countries to continue their practice with proper precautions. With regards to treating patients during the outbreak 63.1% of DHPs performed emergency treatments using personal protective equipment (PPE). DHPs come in contact with varied groups of people from all walks of life and the line of defence for the infection is the appropriate use of PPE. The DHPs should take proper precaution to not unnecessarily put themselves at risk of cross infection and at the same time there is a moral duty to reduce the spread of the infection among their patients.

To decrease the damage associated with COVID-19, public health and infection control measures are urgently required to limit the spread of the virus. Based on previous experience of management of MERS and SARS infections, the WHO recommends infection control interventions to reduce the general risk of transmission of acute respiratory infections. It is hoped that the present study has provided useful information that can be utilized in designing the programs for enhancement of knowledge, attitude and practices towards prevention on COVID-19 in the DHPs.

The infectious agent in COVID-19 is a novel corona virus and research regarding this is continual. As more characteristics of the virus are learnt, there is a constant need to update ourselves as DHPs to the newer information. This was also a drawback of our study, as newer revelations about the virus are constantly emerging the study might need to be updated in the future.

CONCLUSION

Dental Health Professionals are at a high risk for COVID-19 infection due to the proximity to patients' oropharynx during treatment of symptomatic patients and asymptomatic carriers as well. Even though the participants in our study showed satisfactory knowledge and showed positive personal protective practices there is an increasing need for creating awareness and training regarding personal protective equipment and disinfection protocols among the DHPs through reliable means of information.

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