ORIGINAL ARTICLE

Knowledge and Practices for Dental Treatment during COVID-19 – A Survey Based Study

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ABSTRACT

Background and Objective: Coronavirus disease 2019 (COVID-19) is the latest infectious disease to rapidly spread worldwide. The role of dental professionals in preventing the transmission of COVID-19 is critically important while providing routine dental care. The objective of this study was to assess the attitude and perception of dentists to provide treatment to patients and form a general consensus for future dental protocols.

Methods: Data collection was done using a well-structured web-based questionnaire (Google forms). The survey form was distributed by sending the link via email, WhatsApp and other online forums. Data were collected from n = 299 participants and analyzed by using Statistical Package for the Social Sciences (SPSS) version 25. Frequencies and percentages were determined for qualitative variables whereas mean ± standard deviation was calculated for quantitative variables.

Results: A total of n = 299 responses were collected. Approximately 90.6% of the respondents were young clinicians with years of experience 1 – 9 years. Most of the respondents i.e. 70.9% were more inclined towards performing only non-aerosol generating procedures. Ninety five percent agreed upon training of dentists and dental chair side assistants regarding donning and doffing of PPEs and 91% preferred to go for high volume suction for aerosol generating procedures. Ninety four percent of the respondents strongly recommended to check for every patient reporting to dental clinic.

Conclusion: Majority of the dentists are well aware of the current crisis, but trends of ambiguities have been seen regarding adaptation of particular protocol for the dental treatment. Intervention from Government is required to establish proper dental guidelines including provision of PPEs so that treatment could be provided with the best of facilities to the poor patients as well.

KEYWORDS: COVID-19, Dental Emergency, Future protocols, Pandemic.

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INTRODUCTION

COVID-19 was first experienced in the Wuhan City of China towards the end of December 2019. and afterward became pandemic by spreading to further 209 countries of America, Europe, Australia and Asia including Pakistan.[1] The ongoing spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and its related sickness has held the worldwide network at a stand-still and caused

general wellbeing concerns across the globe. COVID-19 is not the same as SARS-CoV, however, it has a similar host receptor, human angiotensin-converting enzyme 2 (ACE2).[2] Once inside the human body, this coronavirus (SARS-CoV-2) is found enormously in nasopharyngeal and salivary secretions of affected patients, and its spread is dominatingly thought to be respiratory droplet/ contact in nature.[3] In Pakistan, the first case of COVID-19 was confirmed by the Ministry of Health, on February 26th, 2020 in Karachi, which increased to three hundred thousand confirmed cases across the country.[1,4] Earlier, all of the confirmed cases had positive travel history from different countries, but currently the situation has become grave due to the local transmission of the virus, making travel history almost irrelevant. Under these circumstances, extra precautionary measures for the general public should be top priority.

The role of dental professionals in preventing the transmission of COVID-19 is critically important. While all routine dental care was previously halted in different countries during this pandemic, therefore organized emergency care by dental teams with appropriate personal protective equipment has become priority.[5] Although patients diagnosed with COVID-19 are not supposed to receive dental treatments, dental emergencies are still possible thus a close contact is unavoidable. Furthermore, due to the relatively longer incubation period of the disease up to 14 days in some cases before the commencement of any symptoms, and the post-infection period, it is challenging for the medical staff to recognize the existence of COVID-19 infection, which could increase the transmission of the disease during these latent periods.[6,7] Therefore, patients infected with COVID-19, without showing symptoms, are of a great threat to dentists and other members of the dental team. Dentists thus should have a high level of awareness and integrity to deal with the disease and be able to control and manage its spread. Most dental procedures result in considerable number of droplets and aerosols containing bacteria, viruses and fungi which can pose health risk to the dental personnel and can lead to transmission of infection. Dental specialists have been advised to take a few individual protective measures or limit the tasks that can generate droplets or aerosols; additionally, the utilization of saliva ejectors with high volume can reduce the formation of aerosols.[8] During the peak of the pandemic, limitations were imposed by Government of Pakistan on routine dental procedures and only emergency procedures were advised to perform.

During the lockdown, a survey was performed on the status of dental profession, with the aim to give insight into how dentistry was changing and what were the expectations for the future. The objective of this study was to assess the attitude and perception of Dentists in Punjab, Pakistan to provide dental treatment to the patients during this pandemic and to form a consensus for future dental protocols.

METHODS

This study was conducted in the month of May-June 2020, after getting an approval from the Institutional Ethical Review Board of Fatima Memorial Hospital College of Medicine and Dentistry, Lahore, Pakistan vide Letter No. FMH-08-2020-IRB-778-M. A total of n = 299 dentists by estimating a 95% confidence interval, with a width of 5% margin of error from Punjab were included. Informed consent for the participants was a part of the online survey, only those participants giving consent could proceed with the questionnaire.

The respondents were consultants, practicing general dentists, post-graduation residents, and private practitioners, working in different sectors of Punjab province, whereas dental hygienists, dental technicians and undergraduate students were excluded from the survey. Data collection was carried out using well-structured online questionnaire using Google forms. The survey was generated and circulated through E-mail and WhatsApp.

The survey questionnaire consisted of different sections. Section 1 of the survey was comprised of demographic profile of dentists including gender, age, designation, years of experience since graduation. In section 2 and 3 Likert scale was used in responses to assess the attitude regarding emergency dental procedures and practices regarding future dental protocols. To maintain the privacy and confidentiality of the information obtained with this survey, questionnaires were kept anonymous.

STATISTICAL ANALYSIS

Data was collected and entered in Statistical Package for the Social Sciences (SPSS) version 25. Qualitative variables were analyzed by using frequency and percentages whereas quantitative variables were expressed as mean ± standard deviation.

RESULTS

Out of n = 299 participants, 74.9% were females and 25% were male. Mean age of respondents was 25 ± 9.6 years. With respect to experience, 90.6% of the dentists had experience of 1-9 years. Approximately two thirds i.e. 75.6% of the participants were general dentists (Table-1).

Table-1: Demographic characteristics of dentists.

Demographic Characteristics	*Frequency*	*Percentage (%)*
Gender		
Male	75	25
Female	224	74.9
Age		
20 – 29	246	82.3
30 – 39	34	11.4
40 – 49	17	5.7
Above 50	2	0.7
Designation		
Consultant/Teaching faculty	28	9.4
General dentist	226	75.6
Post-graduate trainee	34	11.4
Private practice	11	3.7
Years of experience since graduation		
1 – 9	271	90.6
10 – 19	19	6.4
20 – 29	8	2.7
30 and above	1	0.3

Most of the respondents (70.9%) were more inclined towards performing only non-aerosol generating procedures and 75.2% strongly agreed to carry out only dental emergency procedure once the lockdown is lifted. Regarding personal protective equipment 97.6% of the dentists agreed upon training of dentists and dental chair side assistants for proper donning and doffing of PPEs. When asked about travel history 98% of the respondents strongly believed that patients should be inquired about recent travel history. Almost 81.6% of the dentists strongly believed patients should get their hands washed for 20 seconds followed by alcohol-based hand rub. The number of respondents that strongly agreed about patients regarding use of pre-operative mouth rinse with 1% H_2O_2 or 0.2% povidone iodine for 1 minute prior to dental emergency were 79.9% (Table-2).

Table-2: Knowledge and attitude assessment regarding dental emergency procedures.

Questions	*Strongly Agree N (%)*	*Neutral N (%)*	*Strongly Disagree N (%)*
Following dental procedures should be adopted once the lockdown is lifted:			
Only Non AGPs	212 (70.9)	56 (18.7)	31 (10.4)
Only emergency dental procedures	225 (75.2)	41 (13.7)	33 (11.1)
Following should get PPE training for donning & doffing:			
Dentists	292 (97.6)	7 (2.3)	-
DCSA	288 (96.3)	11 (3.7)	-
Housekeeping staff	266 (88.9)	27 (9.0)	6 (2.0)
Patients requiring emergency dental procedure should be inquired about recent travel history	293 (98)	(2.0)	-
Prior to emergency treatment, patient should be advised to do mouth rinse with 1% H_2O_2 or 0.2% povidone iodine for 1 minute	239 (79.9)	49 (16.4)	11(3.6)

For management of endodontic emergency cases, 80.3% respondents opted for chemo-mechanical caries removal as a preferred method, 62.5% would go for conventional management of endodontic emergency with slow/high-speed hand piece, high volume suction and rubber dam. More than half i.e. 53.8% of the respondents preferred to advice medication by deferring the treatment, while 43.5% strongly disagreed to go for extraction (Fig.1).

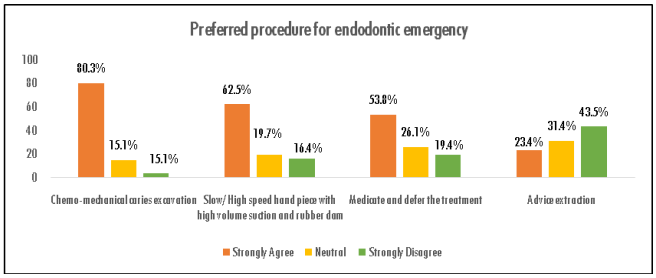

Fig.1: Preferred procedure adopted by dentists for endodontic emergency during COVID-19 pandemic.

Upon asking about checking the body temperature of patients using infra-red thermometer, 94% of the respondents strongly recommended to check for every patient reporting to dental clinic while according to 91.9% it should be done only for appointed patients prior to getting the treatment. When they were asked about their approach towards treating a patient with flu like symptoms, 88.6% of dentists would prefer to advice COVID-19 test and defer the treatment until the symptoms subside, 84% of dentist would counsel the patient and advice for self-isolation. When the respondents were questioned about the approach, if any of the dental team member encounters flu like symptoms, 46.8% of dentist adopted that they should continue normal hospital routine with self-medication and proper PPEs (Table-3).

Table-3: Practice assessment regarding future protocols.

Questions	*Strongly Agree N (%)*	*Neutral N (%)*	*Strongly Disagree N (%)*
Following should be adopted for AGPs			
Special negative air pressure room	240 (80.2)	53 (17.7)	6 (2.0)
High volume suction	273 (91.2)	23 (7.7)	3 (1.0)
Aerosol suction machine	260 (86.9)	33 (11)	6 (2)
Body temperature using infra-red thermal sensors should be monitored for:			
Every patient reporting at outdoor	281 (94)	15 (5)	3 (1.0)
Appointed patients prior to getting the treatment	275 (91.9)	16 (5.4)	8 (2.6)
Approach for treating a patient with flu like symptoms:			
Advice COVID-19 test & defer the treatment until the symptoms subside	265 (88.6)	25 (8.4)	9 (3)
Counsel the patient & advice self-quarantine for 14 days	251 (84)	33 (11)	15 (5)
Any member from dental team having flu like symptoms should follow normal hospital routine with self-medication & proper PPEs	140 (46.8)	48 (16.1)	111 (37)

For post-operative cleaning and disinfection protocols, 87.6% showed positive response for use of ultraviolet germicidal irradiation for destruction of airborne microorganisms and a positive trend was seen among 96% of the respondents regarding use of 70% alcohol solution for disinfection after every patient.

DISCUSSION

COVID-19 has a huge impact on dentistry. Dentists work in close contact with patients and in proximity with the oropharyngeal structures where the viral load and shedding of virus can be high.[9] The New York Times identified dentistry as one of the highest risk professions for contracting the virus due to close working environment because of the aerosol generating procedures being performed on daily basis.[10] This survey was conducted to assess the knowledge and practices of the dentists so that dental practice and patient care may not be a cause of COVID-19 transmission.

Regarding use of personal protective equipment, pre COVID-19 dynamics of practicing dentistry were totally different from what is being practiced now a days and this change in practicing protocols are now being considered as standard operating protocols. Adequate training of the dental team is essential to minimize the spread of this deadly virus.[11] In the light of World Health Organization recommendations all the members of rapid response team should be trained in performing hand hygiene, donning and doffing of PPE to avoid self-contamination.[12]Several protocols have been suggested for protection of eyes, nasal and oral mucosa during COVID-19 outbreak.[13] In the current study, more than 95% of the respondents agreed to the fact that dentists and dental chair side assistants should get proper training regarding donning and doffing of PPEs. In a study done by Stefani et al.[14] 57.2% of respondents declared that they were not trained sufficiently regarding donning and doffing of PPEs and gave a consensus that training of staff should be the top priority.[14]

There is a consensus among professionals regarding monitoring of body temperature, before examination of the patient. For this purpose, infra-red thermal sensors became popular for screening of the patient at the triage stage, as they provide non-contact method for checking temperature. However, this does not mean that the patient with normal reading should be considered disease free as there could be asymptomatic carriers among patients visiting dental facilities.[15] More than 90%

of dentists from this study agreed to check temperature of every patient reporting at the clinic. This is in line with a study in which 93% of respondents suggested to check the body temperature.[16]

All dental organizations emphasized not only the need of reopening the practices, but they also insisted on the requirement of a robust protocol to be developed by considering the safety of staff as priority.[17] At the triaging stage patients with flu like symptoms should be identified as they pose a serious threat to the surrounding community.[18] More than 80% of the dentists not only strongly agreed to advice COVID-19 test, but preferred to defer the treatment until symptoms subside, counsel the patient and advise self-quarantine for 14 days in patients with flu like symptoms. Two of the recent studies have shown that patients displaying flu like symptoms would not be encouraged to attend dental practice and referred to hospital for further treatment. If it is deemed necessary to provide treatment in order to avoid complications, it should be scheduled as the last procedure of the day so that adequate time for clearance and disinfection can be provided.[19,20]

According to WHO guidelines, patients with considerable swelling can progress to life-threatening emergencies, which can increase risk in the setting of reduced health-care availability. For such patients, extraction of the causative infected tooth should be prioritized over restorative procedures.[21] As per recommendations routine dental procedures across the globe were suspended during Covid-19 to limit the increasing spread of the disease.[22] In the present study, 75% respondents believed to go for only emergency dental procedures during the peak of the outbreak. This is in accordance with the study carried out in Italy, where 99.7% of respondents preferred to perform only urgent treatments.[13]

According to a survey carried out earlier, dental care for patients is limited to emergency treatment in most developed countries.[23] According to British endodontic society, advise for clinicians for management of dental emergencies is Advice, Analgesia and Antibiotic (where required) approach.[24] In the current study only 53.8% of the dentists preferred to medicate and defer the treatment. Only 23.4% advised for extraction in endodontic emergency cases. This is in line with the study where primary management was given through medication and extractions were preferred in case of questionable prognosis.[25]

Research is being carried out in different parts of the world to evaluate the possibility of spread of virus through aerosol generating procedures. In this study 70% of participants were in favor of N-AGPs, which is relatable to other study in which measures were adopted to limit aerosol production in 88.5% of cases.[13] Eighty percent dentists were inclined towards chemo-mechanical caries excavation as a treatment modality for endodontic emergency. However, previous studies have shown very low success rate in removing infected dentin with chemicals i.e. Carisolv.[26,27] For immediate management of endodontic emergency cases clinician need to perform AGP for getting access to root canals through the chamber that can only be provided after cutting the dentin with slow/high speed hand-pieces. In this study 62.5% of the dentists still preferred to use slow/high-speed hand piece with high volume suction and rubber dam.

Salivary secretions contain an abundant amount of virus particles, which may help in exponential spread of disease. Dental practitioners need to act diligently, not only to provide emergency care but at the same time reduce the microbial load as they may encounter patients of COVID-19 in emergency.[23] Pre-operative rinse of mouthwash helps in decreasing the viral load in the patient's mouth as cough and gag reflex during dental treatment can result in spread of infection in the dental surgery putting the dentist as well as the other members of the dental team at high risk.[22] So the use of chemotherapeutic agents such as 1% hydrogen peroxide or 0.2% povidone-iodine is recommended for one minute. These can potentially reduce the salivary viral load.[22] However, it is important to note that, chlorhexidine a commonly used mouth rinse in routine dental practices, may not be effective in inactivating SARS-CoV-2.[9,28] Therefore almost 80%respondents from current study adopted the practice to carry out prophylactic mouth rinse with 0.2% povidone iodine or 0.5 – 1% H_2O_2. This is in line with another study in which 90% of patients were asked to perform a hydrogen peroxide mouth rinse prior to dental treatment.[13] While in contrast to these findings another study reported only 22.6%

dentists were following the protocol of pre-operative mouth rinse with 0.23% to 7% povidine-iodine (PVP I) and 36.9% recommended the use of 1.5% hydrogen peroxide as a pre-procedural mouth rinse to reduce the viral load.[28]

According to the guidelines published by American Dental Association any member of the dental team having flu like symptoms should immediately be stopped from working in the dental operatory and there must be a COVID-19 test to confirm the disease[29] Despite published guidelines, 46.8% of the respondents in the current study strongly agreed to follow normal routine with self-medication and use of personal protective equipment for providing dental treatment to patients.

Post-operative cleaning and disinfection of the dental operatory is one of the most essential components of cross infection control. It has been recommended to clean and disinfect patient contact as well as non-contact areas.[30] Ultraviolet Germicidal Irradiation (UVGI) has been shown to be effective at inactivating pathogens on surfaces and in the air. Centers of Disease Control (CDC) recommends the use of UVGI as one of the effective methods to minimize the spread of airborne microorganisms.[31] In this study 87.6% of the dentists showed interest for use of UVGI to destroy airborne microorganisms. However, apart from UVGI other factors, such as careful design of the built environment, installation, and routine cleaning and disinfection, must also be employed.[32]

Concentrations between 62 – 71% of ethanol have shown to decrease coronavirus infectivity.[33] The current study showed a positive trend in 96% of the respondents regarding use of 70% alcohol solution for disinfection after every patient. A survey conducted in Norway has shown that, 90.6% of respondents preferred using 70% ethanol for cleaning and disinfection after every patient.[34]whereas in a study conducted by Sarfaraz et al.[35] only 30% of participants were in favor of using 60 – 71% ethanol for surface disinfectant.

CONCLUSION

Dentists from Punjab are well aware of the current crisis. Despite numerous uncertainties and difficulties, urgent treatments should be provided to the patients in these challenging times with the best standard of care possible and according to the guidelines given by COVID-19 Health Advisory Platform and Ministry of National Health Services.

LIMITATIONS OF THE STUDY

This study has a few limitations in terms of small sample size; hence, it may not correctly represent the true practices in total. Most responses are from younger dentists, so responses from more experienced dentists were lacking. Future studies shall be conducted with a larger sample size to strengthen the conclusions drawn from the topic under discussion.

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CONFLICT OF INTEREST

None to declare.

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None to disclose.

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Author's Contribution

SA, SKL: Data collection, analysis and interpretation, drafting of manuscript.

SE: Concept and design of study, drafting of manuscript.

AR: Concept and design of study, drafting and revising the manuscript critically for important intellectual content.

ALL AUTHORS: Approval of the final version of the manuscript to be published.