

DENTAL CONSIDERATIONS DURING THE OUTBREAK OF CORONA VIRUS DISEASE 2019 (COVID-19)

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ABSTRACT

Objective: To assess the knowledge, attitude and practices of dentists during the outbreak of corona virus disease 2019 (COVID-19) and to give recommendations for management of dental patients during this pandemic.

Study Design: Cross sectional study.

Place and Duration of Study: Department of Operative Dentistry, Armed Forces Institute of Dentistry (AFID), Rawalpindi, from 1st Apr 2020 to 20th Apr 2020.

Methodology: After taking approval from ethical committee, a questionnaire on Google Forms was spread through social media in 300 dentists of Rawalpindi and Islamabad from different fields of dentistry out of which 279 filled the survey with a response rate of 93%. The questions included socio-demographic details, questions pertaining to the knowledge, attitude and practice of dentists towards the spread, cross-infection control of COVID-19 and the dental management of patients. The data was analyzed using SPSS 21.

Results: Total of 246 (88.17%) dentists reported that they were familiar with the protocols for treating patients during COVID-19 outbreak and 258(92.47%) opted for treating only emergency cases. On the basis of gender females were in majority 213 (76.34%), with majority being general dentists 147 (52.68%) and working in public hospitals 102 (36.56%).

Conclusion: The majority of dentists were aware of COVID-19 transmission, cross-infection control and knew how to prioritize patients based on urgency. The dentists being at high risk should follow all the precautions to prevent cross-infection and are highly encouraged to follow guidelines of WHO, ADA and NHSRC Pakistan regarding the dental management during the COVID-19 outbreak.

Keywords: Corona Virus Disease 2019 (COVID-19), Dental management, Emergency Dental Treatment.

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INTRODUCTION

Corona Virus Disease 2019 (COVID-19) spread as an outbreak of pneumonia like disease in Wuhan city of China has quickly become a world pandemic that has affected countless lives across the globe¹. The spread of this viral disease has posed significant challenges for all fields of medicine including dentistry. Its symptoms include fever, muscle aches and a dry cough associated with shortness of breath². Some patients present with only mild to moderate symptoms while some without symptoms go undetected and act as potential carriers in the chain of cross infection. It has been reported that more than 80% of patients have only mild symptoms and recover

without any complications while 15% and 5% have been labeled as severely ill and critically ill^{1,3}. These cases often develop complications like pneumonia and kidney failure ultimately leading to death⁴. The possible routes of transmission that have been suggested so far include direct contact with the patients, through airborne droplets and aerosols^{2,5}. Thus the only approach to combat the spread of this virus is to limit contact between individuals, frequent hand washing, avoid touching one's face and disinfecting contaminated surfaces^{6,7}.

The practice of dentistry involves the use of rotary dental and surgical instruments such as handpieces or ultrasonic scalers and air-water syringes which create a visible spray that contains droplets of water, saliva, blood, microorganisms, and other debris in closed environment.

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This spatter and aerosols settle out quickly, landing on the floor, nearby operatory surfaces, dental health care personnel or the patient. When practicing in the absence of airborne precautions, the risk of COVID-19 transmission during aerosol generating dental procedures cannot be eliminated⁸. Dental care settings invariably carry the risk of COVID-19 infection due to the specificity of its procedures, which involves face-to-face communication with patients, and frequent exposure to saliva, blood, and other body fluids, and the handling of sharp instruments. Three possible ways for COVID-19 transmission in dental practices are airborne Spread, direct or indirect contact with human fluids and contaminated surfaces spread. Given the high risk of cross infection the dentist and dental team should be vigilant of the signs of the infection and should take necessary precautions to protect themselves and the patient.

COVID-19 patients are generally advised not to receive dental treatment because of the possibility of cross infection however dental emergencies can occur which can lead to an emergency visit to a dentist⁴.

Some guidelines for preventing cross infection and dental management have been recommended by the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), American Dental Association (ADA) and Ministry of National Health Services Regulations and Coordination of Pakistan (NHSRC)⁹. A study by Kamate *et al* assess the knowledge, attitude and practices of dentists regarding the COVID-19 pandemic in various continents and concluded that 92.7% had good knowledge and 79.5% had good practices during this pandemic¹⁰. To combat this outbreak and still provide dental management to patients, dentists should be made aware of the precautions to protect themselves. Till now no local literature is available regarding dental practice management during the COVID-19 pandemic so this survey was carried out to assess dentists knowledge, attitude and practice regarding their awareness of COVID-19, its dental implications along with dental managements of

patients during this pandemic and to give recommendations to be followed during this outbreak.

METHODOLOGY

After taking approval from ethical committee (905/Trg-ABP1K2), this survey was carried at Operative Dept, Armed Forces Institute of Dentistry Rawalpindi from 1st April 2020 to 20th April 2020. The sample size was calculated by using the WHO calculator. With a level of significance 5%, with power of test kept at 95%, a total sample size of 112 patients was calculated which was increased to 300 patients to increase the sample size based on the following population proportions¹¹.

Population proportion A= 66.6%

Population proportion B= 33.4%

Dentists (300) of Rawalpindi and Islamabad from all field of dentistry were included in the

Table-I: Demographic details of the study population.

Variable	Dentist n (%)
Gender	
Female	213 (76.34%)
Male	66 (23.66%)
Health Sector	
Public Hospital	102 (36.56%)
Private Hospital	81 (29.03%)
Private Practice	96 (34.40%)
Qualification	
General Dentist	147 (52.68%)
PG Resident	105 (37.63%)
Consultant	27 (9.67%)

study, using the convenient sampling technique, and a questionnaire on Google Forms was sent through social media to all of them out of which 279 filled the survey with a response rate of 93%. Dentists who were not involved in direct patient care or from other cities were excluded of the study. The questions included socio-demographic details, questions pertaining to the overall knowledge, attitude and practice of dentists towards the spread, cross-infection control of COVID-19 and the dental management of patients. The data were collected, compiled, arranged in a systema-

tic manner, and analyzed in terms of frequencies using SPSS version 21. Frequencies, percentages, mean and standard deviation were calculated for qualitative and quantitative variables. The test of significance to evaluate the qualitative variables was Chi-Square Test along with *p*-values.

RESULTS

246 (88.17%) dentists reported that they were

table-II. Majority of the dentists 258 (92.47%) opted for treating only emergency cases and deferring elective procedures as mentioned in table-III. Descriptive statistics of demographic details and knowledge, attitude and practice of dentists are displayed in tables-I. On the basis of gender, females were in majority 213 (76.34%), with majority study population being general dentists 147 (52.68%) and working in public

Table-II: Knowledge of the study population towards COVID-19.

Question	Yes (n%)	No (n%)	<i>p</i> -value
Are you familiar with the latest protocols and guidelines of dental practice during COVID19 outbreak?	246 (88.17%)	33 (11.82%)	0.115
Are you aware regarding the concept of telescreening and triaging?	93 (33.33%)	186 (66.66%)	0.23
How initial screening of suspected COVID-19 patients be done?		(n %)	<i>p</i>-value
In medical centers with appropriate testing kits		99 (35.48%)	0.01
In the dental OPD with a temperature sensor		54 (19.35%)	
On telephone at the time of scheduling a dental appointment		126 (45.16%)	
What is the incubation period of COVID-19?			
0-7 days	0-14 days	0-24 days	
21 (7.52%)	246 (88.17%)	12 (4.30%)	
Which of the following could be the most common mode of transmission of COVID-19 in a dental setting?			
Droplets through sneezing & coughing	Direct contact with a suspected patient	Touching surfaces of a dental unit	
84 (30.1%)	63 (22.58%)	6 (2.15%)	
Through a high speed hand piece	Through ultrasonic instruments	During extraction	
105 (37.6%)	18 (6.45%)	3 (1.2%)	

Table-III: The attitude and practices of the study population.

What treatment should be given during COVID-19 outbreak?					
Elective procedures	Urgent dental care	Dental emergencies	All procedures	<i>p</i> -value	
8 (2.86%)	30 (10.75%)	258 (92.47%)	12 (4.3%)	0.01	
What should be the protocol for managing emergency cases during a COVID-19 outbreak?					
Deferred until the patient tests negative	Managed pharmacologically	Kept of follow-up using telecommunication	Done in negative pressure room with PPE	<i>p</i> -value	
30 (10.75%)	30 (10.75%)	24 (8.6%)	195 (69.89%)	0.00	
Which of the following dental procedures require urgent dental care?					
Procedure	Severe pain due to acute pulpitis	Pericoronitis	Periostitis	Acute Abscess	Pain due to Tooth fracture
N (%)	213 (76.3%)	108 (38.7%)	130 (46.6%)	180 (64.5%)	192 (68.8%)
<i>p</i> -value	0.01	0.00	0.13	0.00	0.00
Procedure	Pain due to luxation/avulsion injuries	Prosthetic rehabilitation	Biopsy of an oral lesion	Suture removal after surgical extraction	Orthodontic management
N (%)	210 (75.2%)	73 (26%)	67(24%)	49(17.6%)	62 (22.2%)
<i>p</i> -value	0.00	0.30	0.23	0.18	0.00

familiar with the protocols of treating patients during COVID-19 outbreak as mentioned in

hospitals 102 (36.56%). *p*-values were calculated for variables with correlations to gender and

qualification. Gender had no significant impact on the knowledge and attitude ($p>0.05$) while the p -values for qualification (tables-II & III).

infection. This together with the fact that most routine dental procedures generate a high array of aerosols makes the dentist susceptible to

Table-IV: Recommendations by the American Dental Association (ADA)¹².

Specialty	Procedure Type	Essential	Non-essential
Restorative	Fillings/Restorations		
	Mild decay		X
	Moderate decay	X	
	Severe decay	X	
	Fracture tooth repair		
	Pain or uncomfortable	X	
	No pain or discomfort		X
	Crown		
	For completion of care for moderate to severe decay or to complete RCT	X	
	Proactive replacement of restoration without delay		X
Veneers		X	
Cosmetics	Cosmetic procedures		X
Endodontics	Active infection	X	
	Patient in pain	X	
	Swelling/Cellulitis	X	
Emergencies	Any patient with urgent needs		
Hygiene	New patient		X
	Recall		X
	Continuing care		X
Oral Surgery	Extractions		
	Active infection	X	
	Patient pain	X	
	Swelling/Cellulitis	X	
	Asymptomatic 3rd Molars		X
Orthodontics	Implants		X
	New bandings		X
	Wire or bracket fractures	X	
	Recall		X
	Debond		X
Periodontics	Orthodontist to make judgment on recall time		
	Initial therapy, debridement or maintenance		
	Contributory risk factors	X	
Prosthodontics	No risk factors		X
	Bridges		X
	Dentures	X	
Paediatrics	Adult guidelines to be followed		

DISCUSSION

Dentistry includes procedures that place the dentist and the dental team in close proximity to the patients faces increasing the odds of cross

catching the infection and also transferring it to other patients. Thus it is important to establish some baseline recommendations which the dental

team can follow to prevent cross infection of COVID-19.

Keeping in mind the spread through dental settings, dentists should try to limit the dental procedures to only those requiring urgent dental care. Generally, it is not recommended for patients to visit a dentist because of the high risk

impacted tooth. The American Dental Association (ADA) and Ministry of National Health Services Regulations and Coordination of Pakistan (NHSRC) has laid down some recommendations for dental procedures that are to be performed and others that can be postponed^{9,12}. ADA has divided these into essential and non-essential

Table-V: List of recommendations to be followed by the dental team during the COVID-19 outbreak^{12,13,20}.

Before dental care starts
*Ensure that the dentist and the dental team have received their seasonal flu vaccine.
*Any member of the dental team showing symptoms of COVID-19 should be tested; if tested positive they should be sent to a hospital and all the staff and patients in contact with that individual should also be tested and Quarantined.
*Any member of the dental team coming in contact with positive COVID-19 patient should be tested and Quarantined.
*Ideally testing kits should be available for the spot testing.
*Use triaging and tele-dentistry to prioritize the patients based on urgency and for scheduling appointments.
*Schedule appointment apart enough to minimize contact between patients; in the waiting area inform patient should be provided sanitizer, face mask and maintain a distance of at least two Meter from each other.
*Prevent patients from bringing companions to their appointment, except for instances where the patient requires assistance.
*If a patient shows signs of COVID-19 refer them to a hospital and defer the treatment; patient not showing symptoms can be treated by taking necessary precautions.
During dental care
*Have patients rinse with a 1.5% hydrogen peroxide or 0.2% povidone for at least 15 seconds before each appointment.
*Disposable and single-use instruments and devices should be used whenever possible to reduce the cross-infection risks.
*Sanitizer and hand soaps should be available for the dental team and the patient before and after the treatment.
*Use of double surgical gloves when contacting blood, bloodily fluids and mucous membranes.
*Use PPE, face masks, eye protection wear and full face shields during treatment and ensure proper ventilation of the dental surgery.
*Intra-oral radiograph should be avoided and if needed extra-oral radiographs should be preferred.
*Minimize procedures that produce aerosols like ultra-sonic scaling and high speed hand-piece and encourage the use of hand instruments where possible.
*Use rubber dam to minimize aerosol spread.
*Prefer the use of high-volume evacuators. Anti-retraction functions of handpieces may provide additional protection against cross-contamination.
After providing dental care
*Discard gloves and disposable instruments after use and remove PPE before leaving work.
*Ensure instruments sterilization and disinfection of surfaces that come into direct contact with the patient.
*Ensure proper disposal of sharp wastes.
*Change clothes and shoes after coming back home.
*Clean and disinfect public areas frequently, including waiting rooms, door handles, chairs, and bathrooms.

of cross infection. But there are some situations that warrant an emergency visit to a dentist like pain from a pulpitis or due to abscess from an

procedures to highlight the need for emergency treatment. Alleviating pain should be the top priority along with stopping the progression of a

disease. Thus, dentists are advised to perform only those treatments that cause pain to the patient including acute pulpitis, pericoronitis, acute abscess, pain resulting from maxillofacial trauma, tooth fractures and luxation/avulsion injuries¹³. Trauma to the head and neck resulting in fractures of the oral and maxillofacial regions should be treated on top priority. Dentists should consider postponing non-emergency conditions like gingivitis, prosthetic and orthodontic interventions unless they pose some functional challenge to the patient.

In our survey 88.17% of the respondents are familiar with the latest protocols and guidelines of dental practice during COVID-19 outbreak and the same ratio are familiar with the right incubation period (14 days) of the disease, while only 44% of the dentist among the study of Khader *et al*¹¹ are aware with right incubation period. In our study 30.1% of the dentists stated that most common mode of transmission of COVID-19 in a dental setting is droplets through sneezing & coughing, 22.5% stated as direct contact with a suspected patient, 21.5% as touching surfaces of a dental unit, 37.6% as through a high-speed hand piece, 6.45% as through ultrasonic instruments and even 1.2% thought as through dental extraction. In a study by Modi *et al*¹⁴ 62% of the responder stated the respiratory droplet as the correct mode of transmission of the virus.

In our study majority of the dentists (92.47%) agreed that only emergency dental procedures should be performed while a small minority of (2.86%) thought that elective procedures should also be performed. Out of the dentists that opted for only emergency procedures, majority felt that pain due to pulpitis (76.3%) and luxation/avulsion injuries (76.3%) should be given a top priority while prosthetic (36.5%) and orthodontic rehabilitation procedures (29.89%) can be postponed. An article by Ather *et al*¹⁵ divides the treatment into emergency treatments requiring urgent care and those that can be postponed. According to him conditions causing pain like acute pulpitis, symptomatic periodontitis, abscess, and traumatic tooth injuries should be

managed on top priority. Similarly, Meng *et al*¹⁶ also emphasized that emergency treatment should be performed alleviating the pain of the patient and the procedure should be kept as minimally invasive as possible.

For prioritizing patients that require emergency treatment triaging could be a useful tool for the dental team. Procedures that do not require emergency treatment and do not pose any threat to the patient can be effectively managed through tele-dentistry¹⁷⁻¹⁹ which is gaining popularity during this pandemic. This modality can also be used to distinguish those patients requiring emergency care and those who can be managed without any intervention. Social media, video platforms and emails all can be used to effectively communicate with the patient regarding their problem and devising a treatment protocol, to give post-operative instructions and follow up thus limits the patient contact. Various recommendations on cross-infection control in a dental setting have been provided by many authors^{12,20}. Below are a few recommendations that should routinely be adhered to and followed.

The results of our survey showed that majority of the dentists are aware of the preventive measures needed to limit the spread of COVID-19 in dental setup. Dentists should prioritize the procedure based on urgency, should be vigilant and uphold all the precautions to break the link in the cross infection of COVID-19. The study had a limited sample size and only targeted the dentists of Rawalpindi and Islamabad. A country wide study should be done on the overall awareness among dentists and the use of PEE and face shield should be encouraged.

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All patients were entitled for free treatment.

Disclosure

The article is original and not presented anywhere else.

CONCLUSION

The majority of the dentists in our study were aware of COVID-19 transmission, cross-

infection control and knew how to prioritize patients based on urgency. The dentists being at high risk should follow all the precautions to prevent cross-infection and are highly encouraged to follow guidelines of WHO, ADA and NHSRC Pakistan regarding the dental management during the COVID-19 outbreak.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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