

KAP STUDY

Analysis of Current COVID-19 Situations in Dental Practice among Karachi Population

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ABSTRACT

Background: December 2019, marked the beginning of novel Coronavirus (COVID-19) from China (Wuhan), which hit the general population and healthcare systems, worldwide, as a pandemic. Karachi reported the first case of COVID-19 on February 26, 2020 in a student returning from Iran. Currently, World Health Organization has put forward specific guidelines for dental practitioners. The primary objective of the study was to determine the practices of dental practitioners in Karachi in following the standard guidelines set by the World Health Organization.

Methods: In this, cross sectional questionnaire-based study, we have collected data from 111 dental practices through random sampling for analysis across Karachi, Pakistan. Structured questionnaire was designed comprising questions regarding knowledge, equipment, financial burden and procedures performed. Using SPSS version 25, descriptive analysis was executed on these variables. A multiple regression test was used to detect any relationship between them.

Results: Majority (55.3%) of the dentists were found aware of the standard guidelines regarding dental practices and treatment of patients during COVID-19 outbreak but implementation in practice has been a major dilemma. Shortage of equipments as well as financial crisis was the main causative factors. Non-emergency procedures (5%) are being performed as well as inadequate protective measures are being adapted.

Conclusion: According to the world standards, dental practices in Karachi should follow the standard guidelines put forward by world-renowned health organizations. Majority ($p=0.44$) of the dentists are aware of the standard guidelines, but lack of resources and financial instability are the primary factors affecting their dental practice.

Keywords: Coronavirus; Dentists; Dental Practice; Precautions; Protective Equipment; Infection Control; Public Health.

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INTRODUCTION

December 2019, marked the beginning of the novel Coronavirus associated with pneumonia, called as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2) reported in Wuhan, China. This later spread out of control and was labeled as pandemic by World Health Organization (WHO) on March 11 2020^{1,2}. Coronavirus, a major pathogen, is targeting human population, which is primarily affecting the

respiratory system. Previous outbreaks of Coronavirus include Middle East Respiratory Syndrome (MERS) happening in Saudi Arabia on April 2014 and Severe Acute Respiratory Syndrome (SARS) in 2002-2004, which posed a major challenge on the healthcare system of the affected nations³.

Interestingly, it has been suggested that this virus was found amongst Chinese horseshoe bats (*Rhinolophus sinicus*) and pangolins and passed on

to other mammalian hosts causing this pathology^{4,5}. Infectivity of novel Coronavirus is of utmost significance because through this tremendous information can be generated to help in the development of effective drugs and vaccine. COVID-19 interaction with angiotensin-converting enzyme inhibitor 2 (ACE-2) has been proposed as to be the primary factor of infectivity. This might be concerning for the patients currently on ACE inhibitors and Angiotensin Receptor Blockers (ARBs) therefore; guidance on its use is urgently required for such patients⁶.

The COVID-19 is believed to spread mainly by respiratory droplets such as sneezing and coughing from human to human being in direct close contact^{9,10}. It is also found to be airborne according to the new research⁹. Incubation period for COVID-19 has been stated to be anywhere between 2-14 days in which the patient may remain asymptomatic. The best estimate of incubation period has been found to be 5 days, after which the patient can present with symptoms¹¹. The infected patient may show flu like symptoms including high grade fever, dry persistent cough, sore throat, myalgia, anosmia, loss or altered sense of taste and stomach upset¹²⁻¹⁴. Generally, patients who are young and without any comorbidity may recover well. However, elderly people and those with comorbidities particularly those with compromised immune system, hypertension, diabetes and chronic respiratory disorders are significantly vulnerable and fall in the highest mortality group⁶. Although patients in this high-risk group usually suffer severe type of COVID-19 infection, cases of mortality have been reported in young individuals without any positive medical history¹⁵⁻¹⁷. Recently, patients as young as 7 weeks old have fallen victim to the pandemic¹⁸.

Regarding the current situation, dental practitioners should acquire knowledge necessary to treat their patients safely and be able to prevent cross infection. Dentists and their staff should comply with the standard social distancing protocols suggested by the Centers for Disease Control and Prevention (CDC) and should enforce their patients' likewise¹⁹.

In light of the exponential rise in the affected cases, lack of staff, equipment, financial crisis and capacity to withstand the steep upsurge faced by health-care professionals, there has been a dire need to adjust health care giving facilities to curtail their routine work to cope with the current crisis²⁰. This included cancelling elective procedures, redeployment of medical staff and minimizing any aerosol generating procedures. If necessary, aerosol-generating procedures need to be performed, then using high volume saliva ejector may reduce chances of COVID-19 transmission. This posed a challenge to the dentists due to the involvement of high-speed hand piece used in majority of the dental procedures causing aerosol generation and the close proximity with the patients^{21,22}. The WHO

has specifically laid down preventative measures for the practicing dentists to follow which includes performing emergency procedures only and following personal protective equipment guidelines^{23,24}.

Our objective for this study was to determine whether the dentists are aware of the Personal Protective equipment guidelines and how the dentists implementing them in their practice. It was also evaluated whether dentists are abiding by the standard guidelines in all areas of their practice and refraining from any procedures, which are classified as non-emergency.

METHODS

A cross sectional survey-based study was carried out by using a questionnaire, which consisted of questions regarding knowledge, equipments, financial burdens and procedures performed by the dental practitioners in this COVID-19 crisis. This questionnaire was circulated amongst different dental practices in Karachi, Pakistan. Particular emphasis was given to the availability of the personal protective equipment as well as performing procedures during COVID-19 outbreak.

Sampling method was random, 111 dental practitioner's data was collected and analyzed. Verbal and written consent was taken from each of the participants prior to filling out the questionnaire. Ethics review committee of Altamash Institute of Dental Medicine has approved this study (AIDM/EC/04/2020/01). Data was collected anonymously, and confidentiality was maintained throughout this study. A structured questionnaire was constructed using Google forms under the headings of demographic data, knowledge, equipment, financial burden and procedures.

Participation in this study was based on inclusion and exclusion criteria. This study comprised of current practising dentists only and those who were not currently practising in Karachi were excluded from the study. Our study consisted of the following variables in which demographic, knowledge, equipment and financial burden were independent variables whereas procedures performed being the dependant variable.

In our study we had 3 independent variables and 1 dependant variable. For statistical analysis we have used Multiple Linear Regression Technique to analyse our data using SPSS version 25. Each of these independent variables were analysed to look for any significant relationship with the dependent variable. Responses for knowledge, equipment, financial burden and procedures were given a mean and a p-value of 0.05 which was considered as statistically significant.

RESULTS

This study consisted of 111 dental practices located in Karachi. Majority of the dental practitioners belonged to the age group of 20-30 years with a small sample belonging to the 31-40 years age group category. Gender which was the most predominant in the study consisted of females. Three quarters of our sample size had a graduate level of education and post graduate education being the minor category. Predominantly, practitioners are working in the private sector with nearly half of them also practising dentistry in hospitals as well as private clinics.

When these variables of knowledge, equipment, financial burden and procedures were entered in multiple linear regression technique for statistical analysis, they suggested presence of relationship amongst them. The correlation of the procedures with knowledge, equipment and financial burden was found ($r=0.532$). In our study, knowledge (p-value 0.44) and financial burden (p-value 0.75) had no significant relationship with the procedures. However, equipment (p-value 0.00) had significant relationship with procedures as shown in Table 1.

Table 1: Significance of knowledge, equipment and financial burden in relation to procedures using multiple linear regression test.

Variables	Coefficient	Standard Error	t-test Value	p-Value
Knowledge	-0.066	0.120	-0.770	0.44
Equipment	0.561	0.103	5.824	0.00
Financial Burden	-0.031	0.122	-0.326	0.75

More than 3 quarters of dentists, amounting to a total of 85.1%, have agreed that they the sufficient amount of knowledge regarding procedures categorised as urgent as shown in Figure 1. Nearly all of them also agreed that regarding the current COVID-19 crisis, personal protective equipment (PPE) as stated by World Health Organisation (WHO) guidelines should be used when doing a procedure on a patient. In generality, participants chose gloves, n95 mask, goggles and surgical mask of being utmost important while being in contact with patients. From the data, it has been found that some dental practices disagreed for using hazmat suit, goggles, surgical cap and face shield. Majority of the dental practitioners have informed through their responses that they are implementing social distancing protocols in their respective dental practices whereas a few dental practitioners have reported lack of adherence social distancing protocols in their respective practices. Nearly all the dental practitioners reported that availability of PPE is a big issue during these times. They believed that the reason for shortage of PPE is due to the unethi-

cal hoarding of the equipment. Majority of the participant's viewpoint was that sterilisation of the equipment is more important now than it ever was before COVID-19 pandemic.

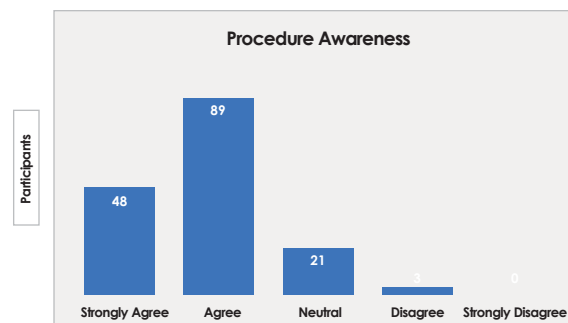


Figure 1: Dentists are aware of the procedures classified as emergency procedures as per the standard guidelines issued.

Correlation amongst demographics such as age, gender and education with procedures was carried out using Spearman's correlation test. A significant relation was found of gender with procedures (p-value 0.001). Although similar was not seen with age (p-value 0.117) and education (p-value 0.948) with procedures as shown in Table 2.

Table 2: Correlations of age, gender and education with procedures.

Parameters	Correlations	Age	Gender	Education	Procedures
Age	Correlation	1.00	-0.41	0.51	-0.150
	Sig. (2-tailed)		0.000	0.000	0.117
Gender	Correlation	-0.414	1.00	-0.238	0.319
	Sig. (2-tailed)	0.000		0.012	0.001
Education	Correlation	0.515	-0.238	1.00	-0.006
	Sig. (2-tailed)	0.000	0.012		0.948
Procedures	Correlation	-0.150	0.319	-0.006	1.00
	Sig. (2-tailed)	0.117	0.001	0.948	

Almost all the dental practitioners assumed that proper disposal of PPE is of unconditional importance to prevent chances of cross infection of COVID-19. Majority reported decrease in number of patients daily since the beginning of the COVID-19 pandemic. Many assumed that due to COVID-19 pandemic, financial issues have occurred. Preponderantly, participants deduced that they are experiencing deficit in availability of dental materials for their procedures.

Due to the economic crisis dental practitioners predominantly agreed to perform non-emergency dental procedures with a small number of dental professionals who abstained from performing non-urgent procedures. Multiple participants concluded that washing patient's hand with hand sanitizer to be the foremost step in preventing transmission of COVID-19. Myriad of dental practitioners denoted that performing aerosol generating procedures such as scaling, root canal treatment

and restorative procedures should be postponed indefinitely as shown in Figure 2. In generality, dentists in their practice decided to delay non-emergency procedures. From the sample size, it was concluded that more than half of the dentists were performing emergency procedures for patients who visited dental practice with COVID-19 symptoms. Nearly quarter of the dentists refused to perform treatment on a patient presenting to the dental practice with severe pain along with suspected COVID-19 symptoms.

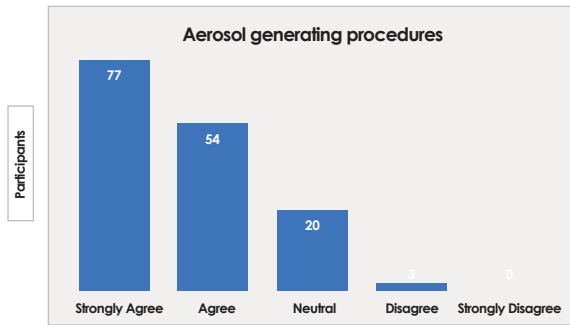


Figure 2: Aerosol generating procedures such as scaling, root canal treatment and restorative procedures should be deferred indefinitely.

DISCUSSION

With regards to the current COVID-19 pandemic, dental practice has been equally affected as compared to the other sectors present in the community. Amongst other healthcare professionals, dentists are struggling to follow guidelines released by world-renowned healthcare organizations. This study reflected how dental professionals were dealing with patients amidst COVID-19 outbreak in Karachi. Data has been gathered from 111 dental practices where majority of dentists are practicing in hospital-based setting whereas a quarter of them working in both hospital and clinic setting. Most of them are aware of the guidelines set forth by the world-renowned organizations but financial issues are one of the causative factors involved in non-compliance during these challenging times.

Current situation suggested that dentists have enough knowledge regarding PPE standard guidelines, but their use is varied throughout the Karachi. During this pandemic, healthcare professionals are experiencing distress and overloaded work regime. Fewer numbers of dentists are using the recommended personal protective equipment during COVID-19 outbreak. Some dental practitioners, working in the private sector, due to their current economic instability, are still performing non-emergency aerosol generating procedures. Due to current situation, lack of resources such as personal protective equipment was a major concern amongst the practicing dental surgeons. Prime reasons being financial instability and unethical hoarding of these equipment²⁵.

It has been found that dental practitioners have adequate amount of knowledge required for the procedures classified as urgent by ADA however, non-urgent procedures were also being carried out which should be deferred according to FDI^{26,27}. Social distancing has been categorically stated to be one of the primary methods for breaking the transmission cycle for COVID-19. Dental practitioners within their clinics are implementing these protocols.

In light of the current crisis, world renowned healthcare organizations such as WHO, Fédération Dentaire Internationale (FDI) and American Dental Association (ADA) recommended usage of necessary PPE when performing procedures on the patient. Although, it can be concluded that many dental practitioners were not implementing these crucial guidelines in their dental practices.

Lack of implementation of the guidelines and significant workload is leading to severe risk of COVID-19 spread. It is believed that awareness programs for dental practitioners and the community is an essential step to mitigate the risk of spread of the disease during this crisis.

In this modern era, social media has been playing pivotal role to close the gap in communication and can be utilized to convey the important messages as well as to form unified platform to update guidelines as per the evolving situation. We also note that there are reports of non-compliance to the guidelines in developed countries reflecting the magnitude of the current global pandemic crisis and its evolving nature²⁸. Although proper guidelines have been mentioned by many world-renowned health organizations, it was noticed that its implementation was a major hurdle in Karachi, Pakistan. Interestingly, in other countries such as UK, there are reports of non-compliance as mentioned on the General Dental Council (GDC) website²⁸.

It can be inferred that due to the rapid spread of the pandemic along with a lag in timely arrangements to adapt to the latest guidelines, which are also changing as the situation continues to evolve, it is difficult to conform to the guidelines. It was found that international guidelines published by ADA and FDI were helpful. Recommended guidelines of World Health Organization for PPE usage, American Dental Association, World Dental Federation (FDI) and GDC amidst the COVID-19 outbreak for the practicing dentists, certain measures are to be followed and implemented in practice. We concluded the following points as recommended by GDC, WHO, ADA and FDI. GDC recommended providing telephonic triage to assess the patients need and treatment planning accordingly. FDI suggests fourhanded technique is beneficial for controlling infection. The use of saliva ejectors with

low volume or high volume can reduce the production of droplets and aerosols²⁷.

Government should strictly implement rules where unethical hoarding of personal protective equipment must be stopped²⁹. Similarly, government needs to come up with a contingency plan to support financially in order to compensate for the financial loss occurred because of postponing the non-emergency procedures by the private dental practices. For every patient visiting the dental practice, screening should be performed in the form of checking temperature. Hand sanitizer should be available for the patients and all healthcare professionals, making sure it is used frequently³⁰.

CONCLUSION

The majority of the dentists are aware of the guidelines however, due to financial burden, lack of resources and rapidly evolving situation with frequent need of changing guidelines. Moreover, it is difficult for dentists in Karachi to adhere to the most recent WHO guidelines.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICS APPROVAL

Ethics review committee of Altamash Institute of Dental Medicine has approved this study (AIDM/EC/04/2020/01).

PATIENT CONSENT

Written and verbal consent was taken from the participants in this study.

AUTHORS' CONTRIBUTIONS

AS collected data and was a major contributor in writing the manuscript. MK analysed data and was a major contributor in writing the manuscript. AL collected data and was a major contributor in writing the manuscript. SH collected data for analysis and produced figures. NA provided knowledge and guidance for this manuscript. MM provided intellectual support.

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