# The Fear of COVID-19 Infection and Its Correlates with Clinical Practice among Nigerian Dentists

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**Abstract**

**Background:** The COVID-19 pandemic was not without its consequences like fear and effect on the economy and health care systems, with dentists being at a high risk of contracting the infection.

**Objectives:** The study aimed to assess the fear and risk of contracting the disease among Nigerian dentists. It also assessed a self-reported economic impact of the outbreak of COVID-19 disease on dental practices in Nigeria.

**Methods:** An online cross-sectional survey was conducted among Nigerian dentists. The survey link was forwarded on social media platforms of Nigerian dentists. The questionnaire inquired about fear/anxiety, self-reported effect on clinic income, adequacy of knowledge on COVID-19, and use of N95 facemask, among others. The statistical level was set at 5%.

**Results:** A total of 314 dentists (184 males and 130 females) within the age range of 22 to 63 years responded. The majority (214; 68.2%), were confident about their knowledge of the COVID-19 disease. Almost all the participants (298; 94.9%) entertained fears of contracting the disease through practice and transmission to family members, while 54.1% strongly agreed that the N95 mask should be worn routinely. However, all (100.0%) reported an economic impact of the pandemic on dental practice.

**Conclusion:** The fear of contracting COVID-19 infection was high among dentists. Therefore, adequate and regular use of protective and preventive measures such as N95 face mask should be a priority among dentists. Attention should be paid to constant medical evaluation to those at risk.

**Keywords: COVID-19 pandemic, Anxiety, Fear, Dental Practice, Dentists, Pandemic Economic Impact.**

## Introduction

The outbreak of a cluster of pneumonia in Wuhan, China, in late 2019 has evolved rapidly into an international public health crisis, and it has spread exponentially to affect almost every part of the world[1-4]. The pathogenic agent identified as a novel coronavirus is a single-stranded RNA virus classified as *Coronaviridae*[3-5]. This family of virus is known to be zoonotic. Other *Coronaviridae* in this family include severe acute respiratory syndrome coronavirus (SARS-CoV), first detected in 2002, and the Middle East respiratory syndrome coronavirus (MERS-CoV), first identified in 2012[6,7]. As the published genome sequence for this novel coronavirus has a close semblance with other beta-coronaviruses such as SARS-CoV and MERS-CoV, the Coronavirus Study Group of the International Committee on Taxonomy of Viruses gave it the scientific name SARS-CoV-2, but

popularly called the COVID-19 virus[6,8]. On January 30, 2020, the World Health Organization (WHO) declared the rampant spread of SARS-CoV-2 and its associated disease (COVID-19) a public health emergency with a currently known overall mortality rate to be as high as 3.4%[6]. According to the WHO situation report (March 22nd, 2021) update on COVID-19, more than 123,543,550 reported cases and 2,723,665 deaths worldwide were recorded during the initial and second wave of the pandemic[9]. This number however, continued to increase even with the development of vaccines.

Following increasing death tolls, there has been an increase in fear and anxiety among groups of people especially those with a higher risk of contracting the disease.[10,11] Given the widespread transmission of SARS-CoV-2 and reports of its spread to health care providers, dental professionals are at high risk of nosocomial infection, rendering them potential carriers of the disease[12-14].

In a report by Gamio[15], dentists were placed high among many health workers who are at the risk of being infected. This risk was based on exposure and closeness to patients during treatment. These risks can also be attributed to the unique nature of dental interventions, which include aerosol generation, handling of sharps, and proximity of the provider to the patient's oropharyngeal region[12-14]. Furthermore, many dental treatments take a long time with the use of the conventional protective wears which do not confer 100% protection[16]. Therefore, there is an increased risk of being exposed to an unprotected patient during dental procedures, placing dentists at a high risk of being infected[16]. Also, if adequate precautions are not in place, the dental office can potentially expose patients to cross contamination[17] and dental practitioners can also spread the infection to their families too.

In this article, we assessed the fear and anxiety among Nigerian dentists concerning the risk of contracting the disease as it relates with the knowledge and clinical practice. Also, the perceived economic impact of the disease on dental practices in Nigeria was assessed.

**Methods**

The study was an online, self-administered questionnaire-based cross sectional survey, carried out on Survey Monkey platform and conducted among dentists in Nigeria. The sample size for this study was calculated using the WINPEPI software[18] to estimate the prevalence of the impact of the COVID-19 outbreak on dental healthcare service provision. A minimum sample size of 309 respondents was generated assuming a prevalence of 15% with a two-sided alpha of 5%, a difference of 4% and a non-response rate of 10%. Data were collected between the 2nd of June and the 3rd of July 2020 and the link to the survey was widely distributed via social media platforms and electronic mails to practising dentists in Nigeria. Ethical clearance was obtained from the Ministry of Health Ethics Committee, Oyo State (AD 13/479/2003B).

The participation was voluntary with submission of completed questionnaire signifying informed consent. Means of identification such as name were not required in the survey, thus, anonymity and confidentiality were maintained throughout the survey. The questionnaire was based on Ahmed et al [19] inquiry on fear and anxiety and modified to include questions on clinic income variations as perceived by the participants. A face validity of the modification to the questionnaire was done. The fear for the infection was assessed using a 5-point Likert scale: extremely afraid, very afraid, somewhat afraid, not so afraid and not at all afraid. Also 5-point Likert scale was used to assess participants' view on adequacy of knowledge on COVID-19 and use of N95 facemask. Also, descriptive analysis of the data was done and frequencies and means reported.

**Results**

A total of 314 dentists comprising 184 (58.6%) males and 130 (41.4%) females within the age range of 22-63 years and a mean age of 38.06± 8.87 years participated in the study. The majority fell in the age group 31-40 years which accounted for about 40.0% of the total number of the participants (298; 94.9%) that provided their age **(Fig. 1).**

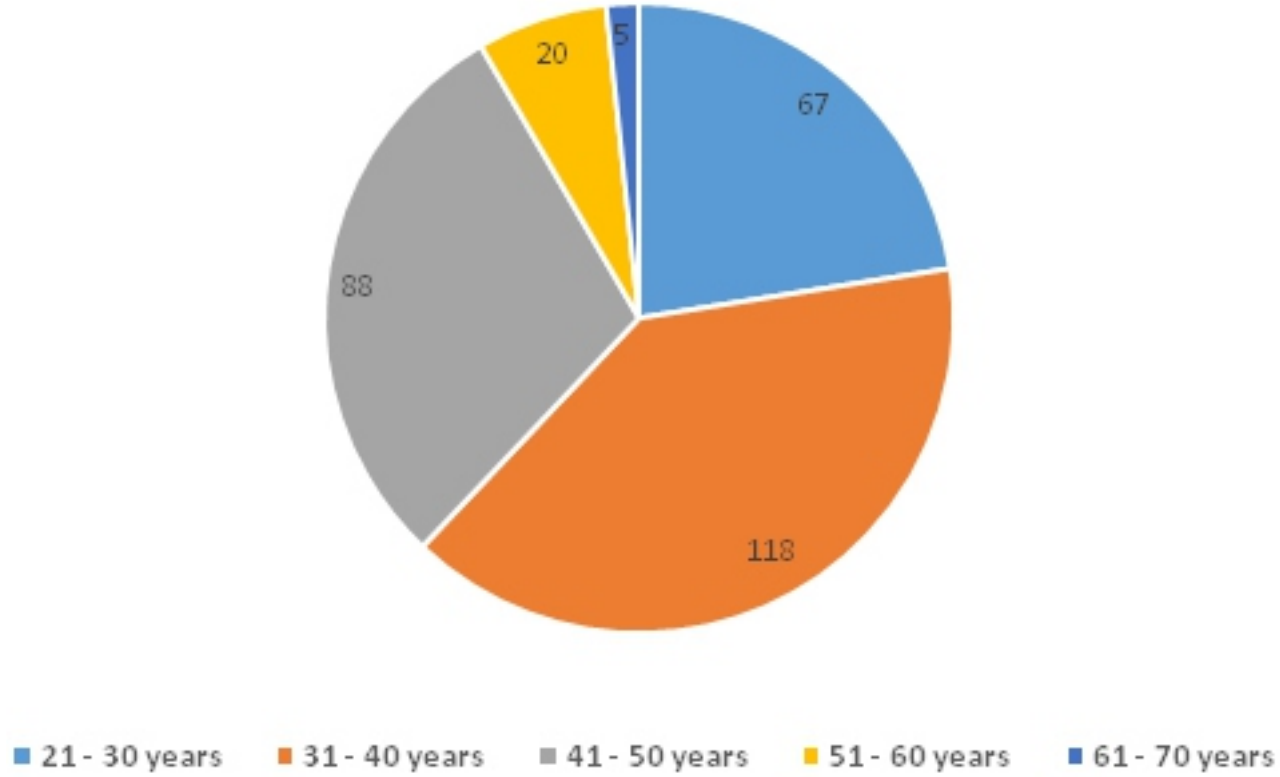


**Fig. 1: Distribution of the Age Group of Participants. (N= 298)**

Among the participants, only 2.9% had managed a patient that was COVID-19 positive, and 87 (27.7%) considered themselves to be in a high-risk population for suffering from various chronic medical diseases that can lead to reduced immunity **(Table 1)**. Such conditions include lung disease or moderate to severe asthma, chronic kidney disease, liver disease, heart conditions, diabetes, people undergoing dialysis or cancer treatment or above 60 years of age. A high percentage (65.3%) of the participants practise in a teaching hospital, while 55.7% of the practice are in the South-Western region of Nigeria **(Table 1)**. Majority (73.9%) observed reduced patient flow in the clinics.

**Table 1: Demographics of participants**

| **Type of practice** | **N** | **%** |
|---|---|---|
| Private practice | 44 | 14.0 |
| General hospital | 37 | 11.8 |
| Teaching hospital | 205 | 65.3 |
| Military hospital | 11 | 3.5 |
| Federal medical centre | 15 | 4.8 |
| Mission hospital | 2 | 0.6 |
| **Total** | **314** | **100.0** |
| | | |
| **Location of practice** | | |
| North west | 44 | 14.0 |
| North east | 13 | 4.1 |
| North central | 22 | 7.0 |
| South east | 19 | 6.1 |
| South west | 175 | 55.7 |
| South south | 41 | 13.1 |
| **Total** | **314** | **100.0** |

| | | |
|---|---|---|
| **Status of the practice as at time of the survey** | | |
| Open and business as usual | 31 | 9.9 |
| Open but lower patient volume | 144 | 45.9 |
| Emergency services and non-AGP procedures only | 118 | 37.6 |
| Open to emergency services | 18 | 5.7 |
| Closed | 3 | 1.0 |
| **Total** | **314** | **100.0** |
| | | |
| **Have you managed any patient with COVID-19?** | | |
| Yes | 9 | 2.9 |
| No | 305 | 97.1 |
| **Total** | **314** | **100.0** |
| | | |
| **Risk of contracting COVID-19** | | |
| High | 87 | 27.7 |
| Low | 227 | 72.3 |
| **Total** | **314** | **100.0** |

Table 2 shows the response to questions relating to the sustainability of the clinic. The mean estimate of the sustainability of infection prevention protocol and the ability of the clinic to return to pre-pandemic status was scored less than 50.0% by the majority of the participants. The mean level of concern regarding the risk of transmission of SARS-COV2 to patients by the dental team was 57.4. When questioned about the recruitment of new members of staff, 15.0% of the participants affirmed that their facility was likely to recruit new staff, while 51.6% responded in the negative. However, 100 (31.8%) participants were unsure. Also, 13(4.1%) participants reported that their facility was likely to lay off some of the staff, while 57.6% reported that there was no such plan for retrenchment in their facility.

**Table 2: Sustainability of practice post COVID-19 pandemic.**

| | N | Mean | SD |
|---|---|---|---|
| On a scale of 1 to 100, how would you rate the likelihood of your practice's standard infection control policy to return to the pre-pandemic levels? | 309 | 44.45 | 26.98 |
| On a scale of 1 to 100, how would you rate the likelihood of your practice's to return to the pre-pandemic levels of service? | 311 | 46.23 | 27.28 |
| On a scale of 1 -100 what is the risk level for the sustainability of your practice? | 306 | 45.81 | 26.68 |
| On a scale of 1 to 100, please describe your level of concern regarding the risk of transmission of COVID -19 in your practice to patients, the dental team and yourself. | 309 | 57.40 | 31.55 |

Concerning the fear of contracting the disease from patients or colleagues, the majority (71.9%, 226) of the participants had some degree of fear, out of which 36 (11.5%) had extreme fear, and 21(6.7%) had no fear of contracting the disease **(Table 3).**

The response of the participants to fear of transmitting the disease to family members, showed that almost all (298, 94.9%) participants had entertained such fears, whereas 63 (20.1%) of the participants described the fear as being extreme. Also, fear of being quarantined if infected, was reported by 273(86.9%) participants, while 288 (91.7%) of the participants were alarmed at the increasing death tolls of the pandemic. Furthermore, the fear of contracting the disease while providing routine dental care for symptomatic patients with cough or asymptomatic patients was shown by the majority (295, 93.9%) and (288, 91.7%) of the participants respectively**(Table 3)**.

**Table 3: Fear of Contracting COVID-19 Infection by Dentists**

| | Extremely afraid /nervous | Very afraid /nervous | Somewhat afraid /nervous | Not so afraid /nervous | Not at all afraid /nervous | No response |
|---|---|---|---|---|---|---|
| Are you afraid of getting infected with COVID-19 from a patient and/or a Co-Worker? | 36 | 45 | 145 | 62 | 21 | 5 |
| Are you afraid that you could carry the infection from your dental practice back to your family? | 63 | 62 | 118 | 55 | 13 | 3 |
| Are you afraid of getting quarantined if you get infected? | 30 | 66 | 88 | 89 | 37 | 4 |
| How afraid are you when you hear the rising death toll of COVID-19 related deaths? | 45 | 79 | 108 | 56 | 21 | 5 |
| Are you anxious when providing treatment to a patient who is coughing or suspected of being infected with COVID-19? | 76 | 94 | 91 | 34 | 14 | 5 |
| How nervous are you when talking to patients in close proximity? | 23 | 50 | 111 | 99 | 28 | 3 |

It was found that, 59 (19.4%) of the participants were determined to keep their practices closed until the number of COVID-19 infection cases started dropping, and a high percentage (62.4%) of the participants claimed they frequently examined themselves for symptoms of COVID-19**(Table 4).**

Furthermore, Table 4 shows the response of the participants to knowledge and practice during the pandemic. A high percentage (68.1%) of the participants were confident of having enough knowledge of the pandemic, and the majority of the participants (81.5%,) claimed they were regularly updated with the NCDC or WHO guidelines for Cross-Infection Control on COVID-19, while 92.0% were aware of the authorities to contact in case of exposure to a COVID-19 infected patient. Also, in view of control, the majority of the participants (77.7% and 83.1%) claimed they take travel/contact history and screening for fever or other symptoms of COVID-19 before attending to a patient respectively. Nevertheless, just about half of the participants (170, 54.1%) strongly agreed that the N95 mask should be worn routinely in the dental clinics, while 74 (23.6%) participants stated how uncomfortable they were, wearing only the surgical mask in the dental clinic **(Table 4)**.

However, the majority (271, 86.3 %) favoured the use of N95 masks for aerosol producing procedures **(Fig. 2).**

**Table 4: Knowledge and practice during COVID-19 Pandemic.**

| | Not at all N % | Not enough N % | Just enough N % | Much N % | Very much N % | No response N % |
|---|---|---|---|---|---|---|
| Do you feel that you have acquired sufficient knowledge (lectures, seminars, information leaflet, etc.) regarding maintaining a safe working environment since the COVID-19 outbreak? | 12 3.8 | 85 27.1 | 136 43.3 | 54 17.2 | 24 7.6 | 3 1.0 |
| | | | | | | |
| | **Strongly agree N %** | **Agree N %** | **Neither agree nor disagree N %** | **Disagree N %** | **Strongly disagree N %** | **No response N %** |
| Do You Think Surgical Mask is enough to Prevent Cross -Infection of COVID-19? | 5 1.6 | 47 14.9 | 57 18.1 | 127 40.5 | 74 23.6 | 4 1.3 |
| Do You Think N95 Mask should be routinely worn in dental practice due to the current outbreak? | 170 54.1 | 98 31.2 | 21 6.7 | 20 6.4 | 2 0.6 | 3 1.0 |
| | | | | | | |
| | **Yes** | **%** | **No** | **%** | | |
| Do you want to keep your clinic closed until the number of reported cases start dropping? | 59 | 19.41 | 245 | 80.59 | | |
| Have you ever worn a N95 mask while treating a patient? | 166 | 53.38 | 145 | 46.62 | | |

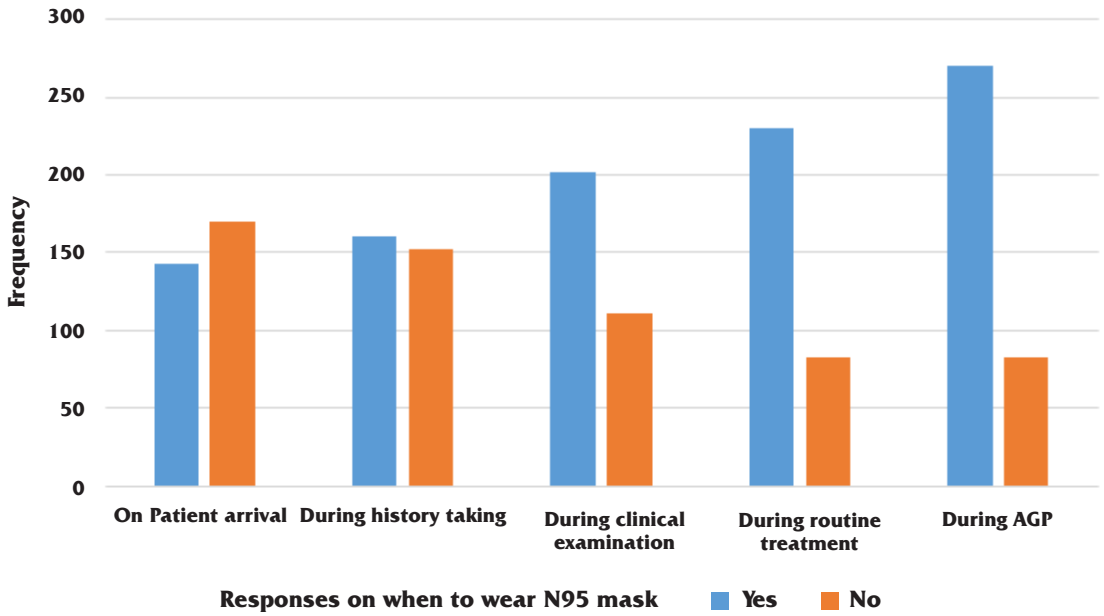


**Fig. 2: Response on when N95 mask should be worn by the DHCP in the dental clinic**

Regarding the responses of the participants to the use of PPE, 166 (52.9%) claimed they had donned an N95 mask while attending to a patient, 89.9% reported they followed universal infection prevention protocol for all patients seen by them, while only 31 (9.9%) participants will use rubber dam as part of infection control to reduce exposure to the oropharyngeal area when indicated.

Consequent to the pandemic effect on dental practice, all the participants reported a drop in the clinic income with 104 (33.1%) and 114 (36.3%) reporting a 25-50% in the short term and the medium to long term respectively **(Fig. 3)**.

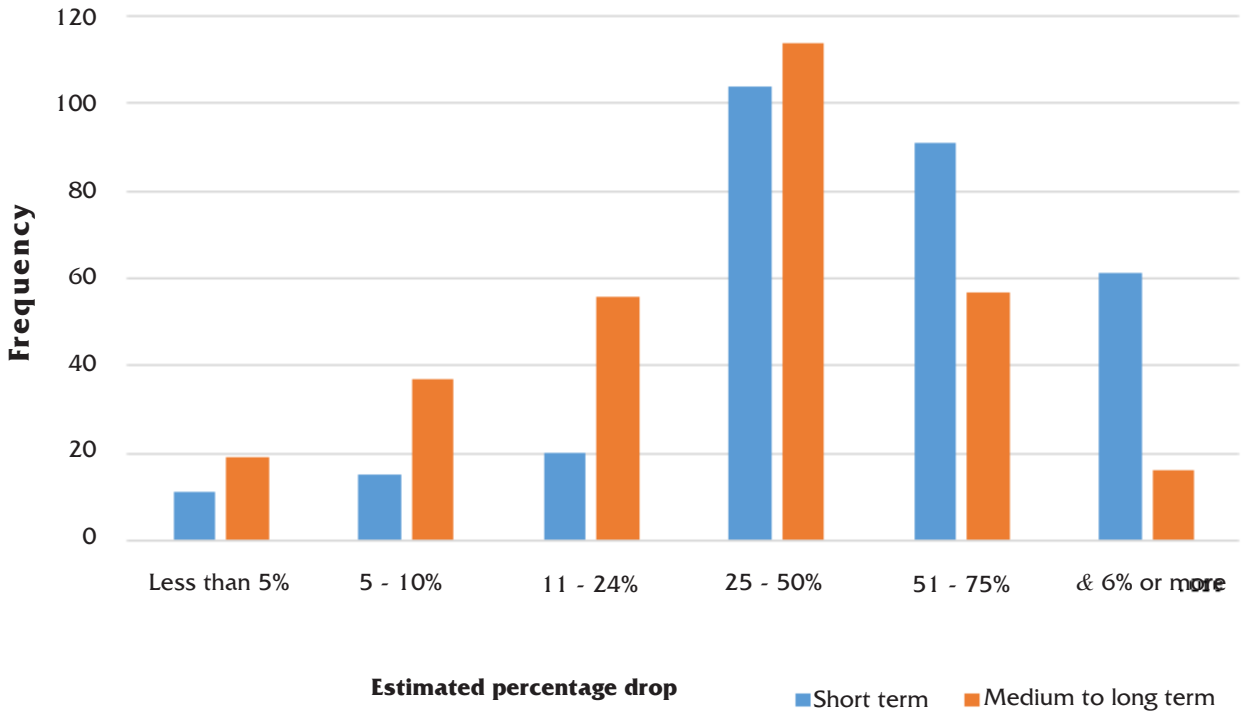


**Fig. 3: Estimated percentage drop in clinic income in short term and medium to long term.**

## Discussion

The Director-General of the WHO in April 2020 stated that the COVID-19 pandemic is much more than a health crisis considering the profound social and economic consequences of the pandemic[20].The core principles underlying the mitigation and suppression strategies adopted to control the pandemic, such as minimizing physical contact by individuals and lockdown of the communities, worked directly against the strengths of the global economy, built around connectivity and interdependence[21]. More importantly, the healthcare industry was severely affected with many professionals exhibiting fear of contracting the disease or spreading it. On the other hand, the oral healthcare providers were subjected to more prolonged restriction due to a higher probability of disease transmission in the oral healthcare provision setting.

A critical aspect of the pandemic is the protection of the Dental Health Care Providers (DHCP) who are at high risk and susceptible to the infection. Such individuals include people older than 50 years of age and those that have systemic diseases such as diabetes and asthma. The majority of the dentists that participated in this study were young with no identified medical condition which could place them at high-risk of contracting the infection. A low percentage (9.4%) of the participants in this study are above 50 years, it is important that DHCP that fall in these categories be identified and not assigned duties that will unduly expose them to contact with COVID-19 positive patients. However, they can be assigned to non-patient care and administrative teams.

Despite the perceived good knowledge of the disease, the fear of contacting COVID-19 was high among our respondents. Irrespective of the age, gender, qualification, type of practice, and knowledge of the disease, the levels of fear reported in the present study were high and this was similar to other studies[19,22]. This is not unexpected as anxiety,

insomnia, depression, obsessive-compulsive symptoms, and somatization are all well-known psychological hazards which have been reported as a possible occurrence among health care workers during a pandemic such as COVID-19[23]. Also, the fear and anxiety could be heightened by the media role, in view of their modes of presentation of the report. However, mild anxiety is natural and fosters preventive and safeguarding behaviour[24], but being on the list of high-risk professions, dentists are very much likely to develop severe anxiety about the current pandemic situation [19].Duruk et al[25], observed that 95% of females and 88% of male dentists were concerned about being infected with COVID-19 due to high occupational risk.

It was observed in this study, that the fear of infecting family members by an infected provider, was high and of utmost concern to the participants. This finding was consistent with other studies carried out among dentists in other countries[26,27].Tysiąc-Miśta and Dziedzic(2020) [26] in a study carried out among Polish dentists, showed that while 51.2% had fear for their lives/health, a higher percentage; 57.6%, were more concerned about their family members being infected.Therefore, in view of the high risk of exposure and fear observed generally among dentists [27], adequate preventive measures must be instituted to reduce the risk of disease transmission in the dental clinic. These measures should include the ample and regular provision of PPE in the clinics. Furthermore, to prevent psychological distress from the perceived fear, and stressful conditions due to the pandemic, psychological evaluations and counselling sessions should be available for staff at high-risk[11]. It is also important and recommended that mental health support be available for such health care dental practitioners.

Concerning protection with facemasks, the study observed that most of the responders favoured constant wearing of N95 masks in the clinics as against the surgical masks, which could be due to the fear being shown towards contracting the disease. However, it has been suggested that the use of the N95 mask should be worn specifically when carrying out aerosol-generating procedures (AGPs) because surgical facemasks have been documented to be as effective and protective as N95 masks in a non-aerosol generating procedure and non-high-risk medical personnel and medical procedures[28]. Only 9.9% of our respondents reported the use of rubber dam when indicated. The use of rubber dams in restorative procedures has always been a necessity to protect the airways and for better visibility of field of operation, and its use in COVID-19 pandemic is being re-emphasized as an important means of limiting the oral exposure to the field of operation only, and to reduce aerosol generation by constant suctioning. The use of rubber dam has been reported to significantly reduce airborne particles by 70% in about 3-foot diameter of the operational field[29].

Similar to many other studies[30-35], the respondents in this study reported a loss of revenue in both the short term (4-6 months) and medium-long -term period (6 months to greater than 1 year)[36]. The low clinic income reported was as a result of the imposed lockdown with decreased patient flow. In a survey conducted by the Irish Dental Association (IDA) which involved 369 dentists, it was reported that one- fifth of the dentists closed their practices (temporarily or permanently), and about three-quarter of the participants expected a financial loss of over 70% amid the COVID-19 outbreak[37]. Also, the British Dental Association (BDA) indicated the same closure of practices, and it was expected that dental practices in the UK were going to face crippling losses due to the suspension of routine dental care[38]. However, in the US, some practices remained opened due to the fear of economic losses and non-payment of salaries[39]. Also, a survey done at the early part of the pandemic in the US, with over 4,000 responses suggested that 42.0% of dentists reported that their income stopped completely compared with 4.0% lawyers, 2.0% pharmacists, and 1.0% physicians[40]. In this light, dentistry seems to be the worst-hit profession by the COVID-19 pandemic. Therefore, the situation requires that adequate financial support be offered to dental hospitals as well as healthcare workers generally to counter any loss that might have been sustained during this period and to meet the urgent needs for the healthcare industry to stay afloat after the pandemic.

Considering the financial losses during the pandemic, which was reported in dental healthcare and other businesses, the governments and regulatory bodies of many high-income countries understood the gravity of the situation and offered support to dental practices. An example is seen in Ireland, where the Irish Dental Association (IDA) mentioned on their website that the Irish government pledged their financial support to businesses, including the dental practices that have been affected by the COVID-19 outbreak, and pledged to give COVID-19 business loans ranging between €5000 and €50,000[37]. It is thus recommended, that similar packages/supports should be considered for dental clinics in low to medium-income countries.

## Conclusion

The study showed that the fear of contracting COVID-19 infection was high among dentists. Also observed, was a self-reported economic impact on dental practice due to the COVID-19 pandemic. Therefore, adequate and regular use of protective and preventive measures such as the use of N95 face masks should be a priority among dentists. While it is important to address the psychological/mental stress that the fear of contracting COVID-19 infection may lead to, it is also imperative that constant medical evaluation should be available for dentists, who are at higher risk of contracting the virus. Furthermore, it is recommended that adequate financial support should be provided by the government, during the period of pandemics, such as COVID-19 pandemic.

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