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COVID Implications in Dentistry – A Questionnaire Survey

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ABSTRACT

Introduction: COVID-19 is a zoonotic virus that originated in bats and pangolins and was later transmitted to humans. The infection began in Wuhan City, Hubei Province in China and was initially diagnosed as an acute respiratory syndrome of unknown origin. The virus has been known to spread via infected droplets, aerosols, and direct contact making it an efficient pathogen. All healthcare workers, especially dentists [since they come in contact with infected aerosol on a daily basis] are at a higher risk of infection with COVID. This study is to check the awareness of the condition among dentists and dental students and to see the effect this disease has brought on dentistry. The aim of this study is to discuss the implications of COVID in dentistry.

Materials and Methods: The study was carried out in a self-administered questionnaire format. The questionnaire was created on an online platform called Survey Planet and distributed to dental students and private practitioners. The questionnaire consisted of knowledge about COVID and steps on taking extra precautions while seeing patients. The data was collected and compiled in SPSS.

Results: Based on the tabulated data, it was seen that most dentists had good knowledge about their practice. 89% agreed that dentists are at a higher risk for COVID. 60.8% said that COVID spreads through infected aerosols. 57.1% said that they would deny treatment to a patient if they suspect them to be infected with COVID-19. 76.9% feel anxious while treating patients and 82.4% are aware of the authorities to call if they come across a patient suspected with COVID-19.

Conclusion: It is important for dentists to use proper PPE equipment like masks, face shields, and gowns. Procedures that involve the production of aerosols should be avoided until necessary. Moreover, proper sanitization should be done after completing a procedure and the chair should be disinfected with disinfectants to minimize the chances of the spread of the pathogen via aerosols. Based on the results it is seen the dentists are very anxious when it comes to treating patients during the pandemic. However, they are well aware of the dangers of this disease and are taking precautions to keep themselves and their patients safe.

Key Words: COVID, Aerosol, Infection, Sanitization, Anxiety, Dental practice

INTRODUCTION

COVID-19 is the first coronavirus to cause a pandemic. The infection started in Asia and spread all across the world.¹ On the 29th of December, 2019, the first four cases of an acute respiratory syndrome of unknown origin were reported in Wuhan city, Hubei province, China. It appears that most of the early cases had some sort of contact with a seafood market.² Initial attempts to control the spread of the virus failed which caused Wuhan to be under quarantine. The carriers travelled across the world and soon cases of COVID-19 started erupting in multiple geographic locations around the globe. The modes of transmission are through contact and in

the form of droplets³⁻⁵ when this virus infects a human, the host clinically present with symptoms of fever, cough, myalgia, or fatigue, abnormal chest CT image, and severe respiratory distress, whereas less common symptoms include sputum production, headache, hemoptysis, and diarrhea.⁶

Previously, we have conducted numerous clinical trials⁷⁻¹³ and various lab animal studies¹⁴⁻¹⁸ and *in vitro* studies^{19,20,21} over the past 5 years. Currently, we are focusing on epidemiological surveys. The idea for this survey stemmed from the current interest in our community.

Ever since the pandemic, the idea of flattening the curve is prevalent which means reducing the number of cases so that

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the healthcare system of a country won't be burdened with an abundant number of cases which is more than what they can handle. This is a problem especially considering that people under emergency healthcare are constantly handling COVID patients which increases the chances of them getting infected.

Dentists have a higher chance of getting infected as dental treatments can lead to the spread of infection since the maximum number of cases of dental procedures cause aerosols generation, frequent exposure to saliva, blood and body fluids, and the handling of sharp instruments. So, to prevent the spread of the disease, dentists should prioritize paper history taking, patient education, and infection prevention measures.²²

Hence, this study aims to see the implications of this disease and dentistry and to check the knowledge of dentists and dental students in regard to COVID-19.

MATERIALS AND METHODS

Study Design and Setting

A descriptive cross-sectional study was conducted in Chennai. The participants consisted of undergraduates, post-graduates, and dentists having a private practice. The questionnaire was pre-tested by dentists in Chennai.

Data Collection

An outline platform known as "Survey Planet" was used. The questionnaire was verified by an external source. The questionnaire was uploaded on www.surveypplanet.com and the link was sent to dental students and dentists across Chennai. The questionnaire can be seen in Figure 9. Data was verified by an external viewer.

Statistical Analysis

Data were recorded in Microsoft Excel 2016 (Microsoft Office 10) and later exported to the Statistical Package for Social Science for Windows (Version 20.0, SPSS Inc., Chicago, Illinois, USA). The results were analyzed and the responses were tabulated in the form of bar graphs.

RESULTS AND DISCUSSION

Out of the 273 people who filled the survey, 34.7% were undergraduate students posted in clinics, 41.7% were post-graduates and 23.4% of people ran a private practice in Chennai [Figure 1]. 89% agreed that dentists are at a higher risk of infection [Figure 2] ($p=0.368$). 60.8% said that COVID-19 spreads through infected aerosols

($p=0.624$). 14.28% said that blood contact can cause the virus to spread. The rest 4.02% were unaware of the route transmission [Figure 3]. 57.1% said that they would deny treatment to a COVID suspected patient [Figure 4]. The others would continue using protective gear ($p=0.012$). 78.02% have started to use more protective equipment while treating patients [Figure 5]. 76.9% feel more anxious while treating patients [Figure 7] ($p=0.048$). 76.5% reported having less number of patients visiting them during the pandemic ($p=0.0229$). Finally, 82.4% were aware of the authorities to contact if they came across a COVID suspected patient [Figure 8] ($p=0.001$).

The emergence of newer pathogens on a daily basis poses a major threat in treating hospitalized patients.²³ Many countries in the world are currently under lockdown to prevent the further spread of the virus. Emergency professionals like the police, firemen, healthcare workers, etc are allowed to come in contact with people. Thus, indeed helps in preventing a large outbreak, but it puts a particular group under higher risk. In Italy, over 13000 health care workers were affected with the death of 86 medical doctors and 8 dentists.²⁴ Similarly, according to studies, as of February 2020, there was 18,811 confirmed cases globally with 2462 deaths in over 29 countries^{25,26}

Figure 1: Bar Graph depicting the experience of the participants of the survey. The X-axis represents the experience of the participants of the study. The Y-axis represents the number of participants choosing either option. The graph depicts 41.7% of the participants are postgraduate students, 34.7% are undergraduate students, and the remaining 23.4% to be dentists running a private practice.

Figure 2: Bar graph depicting the response to the question: Do you think dentists are at a higher risk of contracting COVID-19? The X-axis represents the responses to the question. The Y-axis represents the number of participants choosing either response. 89% of the respondents agreed that dentists are at a higher risk of contracting COVID-19. The remaining 11% did not believe that dentists were at a higher risk of contracting COVID-19 (which included equal numbers of the undergraduates, post-graduates, and private practitioners). The significance was tested using the Chi-square test and the significance was found to be $p=0.368$ ($p>0.05$), which is not statistically significant.

Figure 4: Bar graph depicting the response to the question: If you suspect a patient you are treating to be infected with COVID-19, will you. The X-axis represents the responses to the question. The Y-axis represents the number of participants choosing either response. 57.1%, which includes a higher frequency of post-graduates, would deny treatment to a patient if they suspected the patient to be infected with COVID-19. The remaining 42.9% would do the treatment with proper protective equipment. The significance was tested using the Chi-square test and the significance was found to be $p=0.012$ ($p<0.05$), which is statistically significant.

Figure 3: Bar graph depicting the response to the question: What mode of transmission can COVID-19 spread in regards to dentists? The X-axis represents the responses to the question. The Y-axis represents the number of participants choosing either response. 60.8% believed COVID-19 spreads through infected aerosols, 20.8% believed it spread through saliva, 14.28% believed that it spread through contact of blood and the remaining 4.02% were unaware. The significance was tested using the Chi-square test and the significance was found to be $p=0.624$ ($p>0.05$), which is statistically not significant.

Figure 5: Bar graph depicting the response to the question: Do you use more protecting equipment than usual while treating patients? The X-axis represents the responses to the question. The Y-axis represents the number of participants choosing either response. 78.02% have started using more protective equipment while treating patients. 21.98 still use the same amount of protection as they have been using in the past. The significance was tested using the Chi-square test and the significance was found to be $p=0.001$ ($p<0.05$), which is statistically significant.

Figure 6: Bar graph depicting the response to the question: Have you seen a decrease in the number of cases after during the pandemic? The X-axis represents the responses to the question. The Y-axis represents the number of participants choosing either response. 76.5% have reported seeing a decrease in the number of patients during the pandemic while 23.5% did not notice a decrease in the patient flow at their respective places of practice. The significance was tested using the Chi-square test and the significance was found to be $p=0.229$ ($p>0.05$), which is statistically not significant.

Figure 8: Bar graph depicting the response to the question: Are You Aware of which Authority to Contact if You Come Across a Patient with Suspected COVID-19 Infection? The X-axis represents the responses to the question. The Y-axis represents the number of participants choosing either response. 82.4% of the respondents were aware of the authorities to contact in case they come across a suspected COVID-19 case. The remaining 17.6% were not aware of the contact information. The significance was tested using the Chi-square test and the significance was found to be $p=0.001$ ($p<0.05$), which is statistically significant.

Figure 7: Bar graph depicting the response to the question: Do you feel anxious while treating patients? The X-axis represents the responses to the question. The Y-axis represents the number of participants choosing either response. 76.9% reported anxiety while treating patients. 23.1% reported no such feeling while treating their patients. The significance was tested using the Chi-square test and the significance was found to be $p=0.048$ ($p<0.05$), which is statistically significant.

Table 1- Questionnaire

- Name
- Experience
 - Undergraduate(posted in clinics)
 - Postgraduate
 - Private Practising
- Do you think dentists are at a higher risk of contracting COVID-19?
 - Yes
 - No
- What mode of transmission can COVID-19 spread in regards to dentists?
 - Blood contact
 - Infected aerosols
 - Saliva
 - Unaware
- If you suspect a patient you are providing treatment to, of being infected with COVID-19, will you
 - Deny them treatment
 - Continue with the treatment with proper protective equipment
- Do you feel like avoiding practice until the number of COVID patients decline?
 - Yes
 - No
- Do you use more protecting equipment than usual while treating patients?
 - Yes
 - No
- Have you seen a decrease in the number of cases after during the pandemic?
 - Yes
 - No
- Do you feel anxious while treating patients?
 - Yes
 - No
- Are You Aware of which Authority to Contact if You Come Across a Patient with Suspected COVID-19 Infection?
 - Yes
 - No

Figure 9: Image depicting the questionnaire used in this study.

Orthodontic treatment with fixed appliances alters the oral

environment, increases the plaque amount, changes the composition of the flora, and obstructs the physical removal.²⁷ Hence, it is best to avoid any kind of orthodontic treatment during this time.

This study noted that there is a rise of fear among dentists to treat patients during the pandemic. This is in accordance with a study done by Ahmed et al. where 72% of people felt anxious talking to patients in close proximity, 66% felt like closing their practice until the number of cases started declining.²⁸ This could be because dentists are more vulnerable towards infections spread through direct contact or via aerosols, since their work requires them to be in close proximity to the patient during the time of diagnosis and treatment. When dental students are considered, them showing anxiety towards treatment during the earlier days of their clinical posting is shown in various studies (e.g. a study done by Kirova et al.)²⁹. A study by Guo et al. showed the proportion of dental and oral infections increased from 51.9% to 71.9%. It also showed that the most frequent causes for patients visiting the emergency room are dental, pulpal or periapical lesions and cellulitis or abscess.^{4,30} In an article by Dominiak et al., the guidelines are given by the Polish Dental Association Working Group was mentioned as:

1. Wearing PPE's in proper order
2. Using antiseptics to deactivate the virus³¹

The procedures done by dentists also need to undergo certain changes during the pandemic. According to the instructions given by the DCI, any procedure involving the production of aerosol should be restricted until necessary to minimize the spread of the pathogen. Orthodontic and prosthodontic procedures (which are not urgent) are put on hold to focus on patients who need immediate relief due to pain, swelling, etc. Every dentist who is practicing during this time has to wear every part of their PPE equipment to prevent the spread of infections. While doubling down on the number of masks and gloves is not recommended due to the scarcity of these items, they should be used and disposed of safely once the procedure is completed.

Unfortunately, there is very little evidence to show mouthwashes to be effective against this organism. A study by Renuka et al. showed that chlorhexidine is useless against many kinds of viruses.³² But another study by Maricker et al. showed chlorhexidine to have the greatest zone of inhibition for *Enterococcus faecalis*.³³ A study by Girija et al. showed resistance against carbapenem by *A. baumannii*^{34,35,36} while another study by Vaishali et al. showed Orange peel oil to have a good antibacterial action against *S. mutans*.³⁷ Another study by Priyadarsini et al. showed that virulent genes can be used to create targets against organism³⁸ (e.g. A study by Shahzan et al. showed kaempferol from *A. nilotica* showed an inhibitory effect against ERG11 of *C. albicans*.³⁹ Vaccination can be very useful against viral infections⁴⁰ but

currently, there are no known vaccines against COVID-19. Another method to manage such patients can be through medications to relieve the symptoms. This can be through anti-inflammatory⁴¹ and antibiotics. It is also important to switch up the drugs used regularly because the organism might develop resistance to one particular drug.⁴² The invention of a new drug or vaccine can be done via molecular technology⁴³. This study could be used as a guideline and similar other studies can be made addressing this issue. It is absolutely imperative for dentists to follow proper protection guidelines to safeguard themselves, their families as well as their patients.

CONCLUSION

By the results, we can conclude that dental students and dentists had knowledge about COVID-19 and showed high amounts of anxiety when dealing with patients. This seems to be due to extreme caution taken while dealing with patients. Also, the participants use extra protective measures while dealing with any patient. COVID-19 has had a major impact on the way healthcare is delivered by medical professionals and will have an impact both physically, mentally, and economically on dental services for a few months after the pandemic is over, but if proper safety guidelines are followed, the damage can be minimized.

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Conflict of interest

Nil

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