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## REVIEW ARTICLE

### Role of Public Health Dentist in COVID-19 Pandemic

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#### ABSTRACT

*The main objective of this paper is to highlight the role, duties and actions of public health dentists that they should take during this crucial time to maintain a healthy environment, creating awareness in the community, providing optimum dental care by following the proper protocol of infection control in dental set up as well as patient management. This article focuses on the current ongoing pandemic which has affected millions of people. It has been declared as a "Public Health Emergency of International Concern" in January 2020 by World Health Organization (WHO). The main route of transmission of the coronavirus is via respiratory droplets and aerosols. As the dental professionals work very near to the patient's mouth which is the hub of the coronavirus, there are high chances of transmission of infection between the dental professional and the patients.*

**Keywords:** COVID-19, dentistry, Public health, SARS-CoV-2, epidemiology, preventive dentistry, infection control, coronavirus infection

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#### INTRODUCTION

In December 2019, in the Wuhan capital of Hubei Province in the People's Republic of China, it was observed that lots of patients were suffering from a severe form of pneumonia. Then in January, this virus was isolated through the oropharyngeal and nasopharyngeal swabs of affected patients and this new strain of coronavirus was named as SARS-CoV-2 virus.[1]Initially, it started as an epidemic, then it progressed worldwide involving 309 countries and became a global pandemic.[2]Almost all the countries imposed nationwide lockdown to break the transmission of the coronavirus. Due to lockdown, India has restricted the spread of this virus to some extent. According to Occupational Safety and Health Administration (OSHA), dental health care personnel (DHCP) are placed in a very high exposure risk category as dentists work close to the patient's oral cavity.[3]The use of ultrasonic and rotary instruments in dental treatment generate aerosols which is the main route of transmission of coronavirus.[1]So as a public health dentist, steps should be taken to have a proper understanding regarding the structure of the virus, obtaining the data regarding its origin, and mode of transmission. They can be a part of the survey and can analyse that data for creating a plan of action and organize public health awareness programme.[3]

#### Structure of the virus

SARS-CoV-2 belongs to the family of coronaviridae. Its subfamily is orthocoronavirinae. These are RNA viruses having club-shaped spikes that project outward from their surface that latch onto human cells. They undergo a structural change that allows the viral membrane to fuse with the cell membrane. The size of the coronavirus ranges from 50nm to 200nm with an average of 120nm.

#### Clinical features

The severity of novel coronavirus infection varies to a great extent. The major symptoms of the coronavirus include fever and headache, sore throat, dry cough, diarrhoea, aches and pain, loss of taste and smell and skin rash. Serious symptoms include difficulty in breathing, pneumonia, loss of speech and

movement. It has been found that elderly people with any kind of comorbidity and persons having low immunity are considered at high risk for this infection.[4]

#### **Routes of transmission of coronavirus**

Current evidence suggests that the main route of transmission of the coronavirus is via respiratory droplets and aerosols when a person comes in close contact with the infected person and the virus enters to oral cavity, nose and eyes when that person coughs, sneezes and talks. During the dental procedure, the use of a high-speed handpiece and ultrasonic instruments in a patient's oral cavity may cause their secretions, saliva, or blood to aerosolize the virus into the surroundings.[3]

#### **Management**

Treatment strategies should be mainly aimed at according to the severity of the disease. According to M.O.H.F. Win India, mild cases may be managed at COVID care centre, can also take consultation from Community Health Centre (CHC), through the home visit and also by telemedicine. Patients with the moderate disease should be referred to the emergency unit, primary care and outpatient department. People with severe illness and pneumonia should be immediately admitted to ICU where all the vital signs can be monitored for 24 hours and can be provided with sufficient respiratory support. Anticoagulation treatment with heparin is recommended in those patients.[5,6]

#### **ORAL HEALTH IMPORTANCE**

"In 2000, the first and only Surgeon General's Report on Oral Health made it clear that oral health is part of overall health and well-being." [7] Some predominant oral conditions are dental caries and periodontal diseases and they can also be prevented if proper oral care will be maintained. [8] The most common chronic childhood disease is dental caries which also persists in adulthood. This oral disease may progress to cause pain, infection, and sepsis. Besides primary prevention, in the early stages, the progression of the disease can be arrested by taking some essential steps like maintaining proper oral hygiene, fluoride exposure, dental sealants, changes in diet, and other measures.

Public health dentists can contribute in many ways and can play various roles in reducing the burden on the health care system during this pandemic through:

a. As an epidemiologist:

Public health dentists also an epidemiologist who is well versed in studying the distribution of health-related events in a population, oral health surveillance, policy development, community-based disease prevention, and oral health promotion. During this COVID-19 pandemic, they could actively participate and exercise epidemiological methods to find out the main source and origin of the outbreak.[2] They can be the front line health workers in this situation and can carry out the following functions.

- Identifying health issues in an affected community.
- Finding out route and mode of the transmission of COVID infection.
- Obtaining data by doing a survey, clinical study and interview.
- Analysing data and reaching conclusions.
- Creating a plan of action to stop COVID crises in the population.
- Using the epidemiological data in policymaking.
- Communicate with policymakers on public health.
- Organising various public health awareness programs and supervising them.
- Conducting several research and studies to gather more information regarding COVID-19.

As this infection can transmit through the air, so the major protocol which is to be followed is staying at home, maintaining social distance, using mouth masks, avoiding crowded places and hospitals unless it is an emergency. A public health dentist can deliver correct information to the public regarding this COVID infection as a health communicator so that people are not misled by rumours or any kind of inaccurate information which is shared on social media or any kind of digital platform.[2] So, as public health professionals, they could reach the public, actively participate in contact tracing procedures which helps in identifying the COVID positive patients, and their close contacts. They can educate the people regarding oral hygiene maintenance during a pandemic.

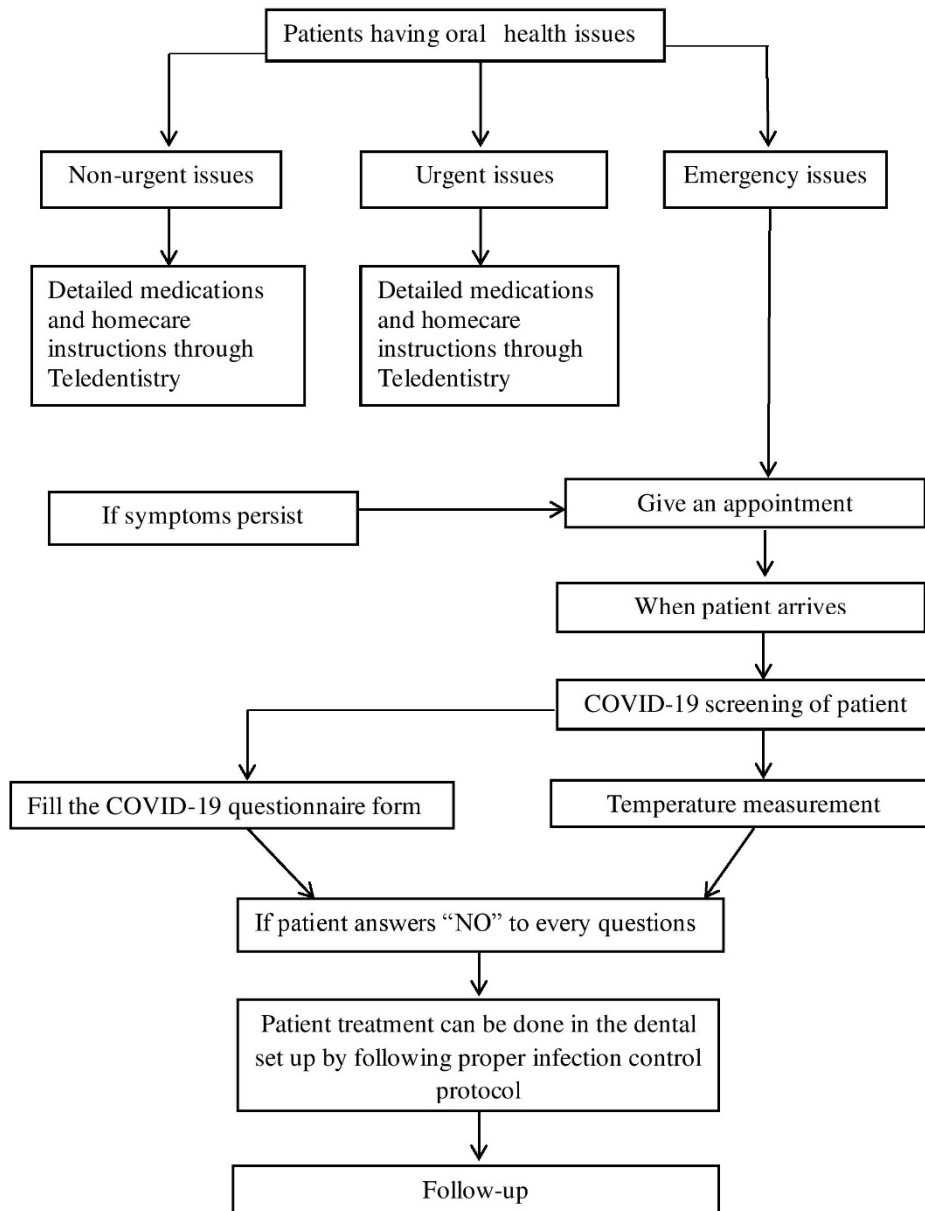
b. *Focusing on prevention and promoting non aerosol-generating dental procedures:*

Prevention is a keystone of public health. The COVID-19 pandemic provides an opportunity for the dental profession from shifting the focus from surgical intervention and giving emphasis to prevention. Non-surgical, non-aerosolizing caries prevention and management should be encouraged as it will reduce the infection.[9] Atraumatic restorative treatment (ART) should be initiated and use of other materials such as silver diamine fluoride, sodium fluoride varnish, and other self-applied and professionally applied

topical fluorides which can be applied by hand instruments without generating aerosols can reduce the risk of viral transmission.

c. *Progressing teledentistry to address the gaps:*

Teledentistry helps in providing dental care, and consultations by using information and communication technology. It establishes the communication between health professionals and patients and delivers the services and oral health information. This is the specialty of teledentistry which helps in connecting the unreached and rural communities primarily with oral care providers.[10]This advancement can be a great support in addressing the gaps and communicating with the patients during and after the pandemic. Online telephonic counseling and triage of the patients are needed. Depending on the patient’s signs and symptoms, it can be decided whether patients require urgent dental treatment or not. Proper medications should be prescribed and home care instructions can be given for those cases where dental treatment can be postponed.



**Figure 1.** Management of oral health problems in COVID-19

**a. Maintaining proper patients screening protocol:**

All oral health care professionals like dentists, dental assistants and receptionists should be aware of the protocols that have to be followed for infection control of COVID-19. Once it has been decided that the patient has to be checked in the dental setup, the next step should include the evaluation of the patient for signs and symptoms of COVID-19 infection. According to the Centre for Disease Control and Prevention

(CDC) guidance, COVID positive patients should not be treated in dental settings rather they should be shifted to an isolation room where proper infection control measures are available(Figure 1).[11]

Patients should be advised to fill the COVID-19 screening form to take the detailed history of COVID-19 infection. The questionnaire could gather information regarding symptoms of fever, cough, sore throat, breathing difficulty, patients travel history and detailed medical history, exposure to any COVID-19 case or any suspicious patient. When a patient arrives, screening could be done using a contact-free forehead thermometer. Using the information gathered, it will be decided whether the patient requires immediate treatment or not in the dental settings and if so then the treatment should be done by following the recommended protocols.[12]A public health dentist can help the administration of the dental set-up regarding infection control protocol and can educate all the dentists, nurses, and other staff about certain aspects which have been described as follows:

#### 1. **Waiting Room set-up:**

Signs and posters having instructions regarding hand hygiene, and respiratory hygiene could be placed at the entrance and other convenient and favourable locations. Indian Dental Association has recommended instructions and guidelines about how to prevent the entry of virus through the nasopharynx, oropharynx, by covering the nose and mouth with proper face mask and tissue, disposal of all the toxic products in a separate tank and use of hand wash and alcohol-based sterilium for sanitation of hands.[13]Appointments can be arranged and planned in such a way that physical distance, public gathering and crowd can be avoided.

#### 2. **Following recommended protocol, while providing treatment:**

As the dental professionals work very near to the patient's mouth which is the hub of the coronavirus, the highest level of personal protective equipment (PPE) is recommended for them while treating patients. Before examining any patient, and providing any dental treatment, dental professionals should wash their hands properly. After checking the patient's mouth, blood, or any injured tissue and wound, they must clean their hands to avoid contamination.[14] The instruments which will be used must be sterilized in an autoclave. Hydrogen peroxide mouthwashes with a concentration of 0.5-1% are recommended before performing any dental treatment because it is an effective virucide that can destroy the viruses. Also 0.5% povidone-iodine can be used as a disinfectant which will help in preventing the growth of the virus in saliva.

As public health dentists, we can prioritize ART and should ensure the disinfection of hand instruments like spoon excavators before performing any procedure to prevent the spread of coronavirus infection. Rubber dam application and four-handed dentistry should be mandatory if any aerosol-generating procedure has to be performed.

#### 3. **Ensuring proper surface disinfection after the treatment:**

The proper hygiene of the dental clinic, as well as the community health centre, should be maintained by disinfecting with 1% sodium hypochlorite which will help in preventing the risk of cross-infection.[15]

#### 4. **Waste management:**

A public health dentist can educate all the hospital workers regarding the segregation of all biomedical waste and their safe disposal. Any infected waste containing human tissue, blood and any other body fluids, drugs, swabs, dressings must be discarded in a separate receptacle. Disposable syringes, needles, and any sharp instruments must be discarded in a separate tank. This biomedical waste with the tank should be kept in an isolated area which should always be away from public access to avoid cross-infection.[16, 17]

#### 5. **Special Concerns for Rural Communities:**

In developing countries like India still, there are some remote areas where there is no access to broadband internet services, cellular telephone facilities, and ever-present financial hurdles. So in those communities implementing this virtual system and teledentistry facility will be arduous. Along with its affordability of health care, especially oral health care will be a remarkable challenge for rural people because of the financial crisis. To avoid the transmission of coronavirus infection, now additional safety measures and protocols have been added to the dental setup and also in treatment procedures as recommended by Indian Dental Association which makes the oral health care cost even more expensive. This can be the greatest barrier for a rural community in seeking dental treatment. Till date no major insurance companies are there that offer dental insurance as an exclusive cover. These problems of rural areas have now been disclosed more evidently because of this COVID-19 pandemic. In India, health care delivery in rural and remote areas is mainly provided through the primary and community health centres, so being public health dentists we must try to provide every possible dental treatment in these centres and there should be the provision of a basic package of oral care in each centre especially for people who cannot afford the dental treatment which has become even more expensive during this pandemic.

**CONCLUSION**

Now the time has come that the public health dentists should self-realize that their work is not only limited to provide treatment to dental diseases but also reaching the general public and educating them how to take proper care of their oral hygiene at home especially during this pandemic, can convey the significance of oral health to overall general health and can promote prevention and non-aerosolizing treatment modalities. In addition to this, they should also develop and implement oral health policy and strategy, promote oral health, create a supportive environment, strengthen community action, and take part in the research process of vaccination. Newer advancements like teledentistry can help oral health care professionals in assisting the patients by avoiding the transmission of infection. All dental professionals must improve their understanding, awareness and skills required for proper infection control during this COVID-19 pandemic.

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