



# **Assessment of Knowledge, Attitude & Practice of Pedodontists Regarding Disinfection Protocol During COVID 19 Pandemic: A Cross Sectional Study**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

**Introduction:** The whole world has been closely focusing on an outbreak of respiratory disease caused by a novel coronavirus that was first reported in Wuhan, China, on December 31, 2019, and that continues to spread. This article, based on our experience and relevant guidelines and research, not only gives essential knowledge about COVID-19, but also about disinfection protocols in dental settings.

**Aim & Objective:** To investigate knowledge, attitude & practice of Pedodontists regarding disinfection protocol during the COVID-19 pandemic.

**Materials & Methods:** A quick online cross-sectional study was conducted among 335 Pedodontists of India. A 16-point questionnaire was made on Google forms and distributed amongst 420 Pedodontists in India, out of which 335 responded. The collected data was sent for appropriate statistics.

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**Results:** Of the total participants 95.82% of Pedodontists are aware of disinfection protocols to be followed during COVID-19. 57.31% of Pedodontists say that 1% sodium hypochlorite is effective in disinfecting operative surfaces & the best agent to disinfect dental waterlines.

**Conclusion:** The role of Pedodontists in preventing the transmission of COVID-19 is of paramount importance. The role of Pedodontists in defending covid19 is essential.

*Keywords: COVID-19; pediatric dentistry; infection control; infectious disease; coronavirus.*

## 1. INTRODUCTION

The whole world has focused on the outbreak of the novel coronavirus of the novel first reported in Wuhan, China, on December 31, 2019, and which continues to spread. On February 11, 2020, the World Health Organization named the virus "coronavirus 2019" (COVID-19) [1]. On February 11, the International Committee on Taxonomy of Viruses made a public name for the old virus COVID-19: SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 (SARS-CoV-2) [2]. Antibiotic measures are needed to prevent the virus from spreading and help control the epidemic [3]. Because of the characteristics of the dental settings, the risk of cross-infection can be high among patients and dentists. In dental practices and hospitals in areas affected by COVID-19, strict and effective antimicrobial regulations are urgently needed [3].

The virus is transmitted mainly through respiratory, contact fluids, and human and family reactions. The youngest patient confirmed for 2019-nCoV infection was only one month old [4]. Other viruses from the same family include acute respiratory syndrome coronavirus (SARS-CoV-2), which emerged in 2002, and the Middle East respiratory syndrome corona virus (MERS-CoV), which was reported to be 2012. The incubation period was originally thought to be 14 days, with most reported cases having shorter periods [5].

Rapid transmission of the disease and the increasing number of confirmed cases associated with changing but limited data on transmission, prevention, diagnosis, treatment, and prognosis have caused widespread public concern and confusion and affected the delivery of essential health care services, including dental care for those in need of emergency care. As dentists treat emergency patients in times of uncertainty with COVID-19 disease, we must develop a comprehensive understanding of the disease, especially its transmission mechanisms, and use more intelligent ways to protect our patients and staff as best we can [6].

To prevent the transmission of all respiratory infections, pediatric dental practices must comply with antimicrobial agreements. Offices should also follow standard cleaning and disinfection techniques used during the flu season at all times. (This Giudice 2020) The use of protective equipment (PPE) such as gloves, masks, goggles, dental uniforms, surgical clothing and shoes should be prescribed by a pediatric dentist [7].

The first case of a COVID-19 dentist was reported on 23 January 2020 to the Department of Dentistry at Wuhan University Dental Hospital [8]. Dental patients may cough or sneeze during treatment and their saliva (and possibly blood) fluids may be aerosolized during the use of ultrasonic devices or speed instruments. Toothpaste can be contaminated or exposed and these infected materials can cause infection through piercing or direct contact with the mucous membranes of the hands and hands. Symptoms of pregnant women with COVID-19 pneumonia vary, with the main symptoms being fever and cough. There is no evidence of vertical transmission in late pregnancy [9].

Occurrences of high airway obstruction are often associated with arousal, sleep apnea, intermittent hypoxemia and hypercapnia, and high blood pressure at night [10]. Strategies, including awareness and training [11]. When a patient arrives at dental practice, patients should complete detailed medical history [12]. Also, travel history should be consulted. Or contaminated dental implants or natural areas create a potential for transmission of the virus to providers and other patients.

Emergency dental care was provided with advice on robust human protection and ways to reduce and avoid the production of drops and aerosols, the use of high-aspiration aspiration, etc., as recommended during the first outbreak of SARS [13,14]. The advent of SARS in 2003 suggests that knowledge and attitudes about infectious diseases are associated with a level of fear in

humans, which could further intensify efforts to prevent the spread of the disease [15].

Therefore, the current study was conducted to investigate the knowledge, attitudes and practices of Pedodontists regarding antimicrobial regulation at the dental level during the Covid-19 epidemic in India. Also, what steps should be taken by all dentists in the dental area to kill germs at the clinic.

## 2. MATERIALS AND METHODS

### 2.1 Sample Size

The study started on 30th April 2021 and ended on 20<sup>th</sup> June 2021. It is a quick online classified study, conducted among 335 Pedodontists in India with the approval required by the IEC. A list of questions was sent to 410 Pedodontists in India, of whom 335 responded. The questionnaire was prepared and sent to everyone by "Google Forms."

### 2.2 Test Tool

The list of questions is composed of modified questions [16]. A total of 18 questions, of which two were personal details (age and current occupation), four were closed questions, and the remaining questions were on their knowledge, attitudes and antimicrobial agreements in the placement of teeth during the epidemic. COVID-19.

Data were obtained from participants using a self-contained and verified questionnaire that included information, attitudes, and the effectiveness of antimicrobial procedures among Pedodontists victims of the Covid-19 epidemic in India.

### 2.3 Statistical Analysis

Statistical analysis was performed using descriptive statistics using frequency and percentage and the software used in the study was a version of SPSS 22.0. Monitoring of the Chi-square. The P-value (<0.05) is considered statistically significant.

## 3. RESULTS

Of all the participants, 95.82% Pedodontists know that antimicrobial measures should be followed during COVID-19. 57.31% of Pedodontists claim that 1% of sodium hypochlorite is effective in reducing germs in the workplace and is the best antimicrobial agent in toothpaste. 83.88% Pedodontists know how to disinfect tools. 62.09% of Pedodontists say spraying should be done by the end of the day, with 44.78% believing that 5% H<sub>2</sub>O<sub>2</sub> should be used for spraying, while only 28.06% believe 20% H<sub>2</sub>O<sub>2</sub> should be used. 39.10% Pedodontists say 45min is active in breathing. Of all 81.19% of Pedodontists participants engaged in these procedures, while 18.81% did not perform these procedures. (Tables 1 & 2)

**Table 1. Questionnaire used and responses obtained**

Sr.No.	Questions	Options	Frequency(n)	Percentage(%)
1.	Are you aware of covid 19 pandemic?	Yes	330	98.51
		No	5	1.49
2.	Are you aware of disinfection protocol during covid 19?	Yes	321	95.82
		No	14	4.18
3.	Which of the following agent do you think are Most effective in disinfecting operative surfaces?	1% Sodium hypochlorite	192	57.31
		Using Detergent	3	0.90
		5% Sodium hypochlorite	140	41.79
4.	According to you best agent to disinfect dental waterlines?	1% Sodium hypochlorite	178	53.13
		0.01% Sodium hypochlorite	150	44.78
		0.001% Sodium hypochlorite	4	1.19
5.	What is the recommended handwash timing?	10 sec	15	4.48
		20 sec	302	90.15
		30 sec	18	5.37

**Table 2. Questionnaire used and responses obtained**

Sr.no	Questions	Options	Frequency(n)	Percentage (%)	
1.	When should you autoclave the Handpiece?	After every patient	263	78.51	
		After 5 patients	17	5.07	
		At the end of the day	52	15.52	
		Not Required	3	0.90	
2.	How are instruments disinfected?	1st with tap water, then wipe with spirit, then autoclave	281	83.88	
		Wipe with spirit and autoclave	49	14.63	
		Directly autoclave	5	1.49	
3.	When should Fumigation be done?	After every patient	85	25.37	
		After 5 hours	3	0.90	
		At the end of the day	208	62.09	
		Twice a day	39	11.64	
4.	With what should the operating area be fumigated?	20% H2O2	94	28.06	
		11% H2O2	56	16.72	
		5% H2O2	150	44.78	
		15% H2O2	32	9.55	
5.	How long the fumigation process is done?	30 mins	137	40.90	
		45 mins	131	39.10	
		60 min	52	15.52	
		90 mins	15	4.48	
6.	Cleaning of the floor should be done with?	Detergent & freshly prepared 5% Sodium hypochlorite for 10 minutes in every 2 hours	104	31.04	
		Detergent & freshly prepared 5% Sodium hypochlorite for 10 minutes after every patient	91	27.16	
		Detergent & freshly prepared 1% Sodium hypochlorite for 10minutes in every 2 hours	80	23.88	
		Detergent & freshly prepared 1% Sodium hypochlorite for 10 minutesafter everypatient.	60	17.91	
		All 3 in 1 syringe, water outlets, hand piece, water pipelines, etc. should be flushed with the disinfectant solution for	10-20 sec	69	20.60
			20-30 sec	174	51.94
	30-40 sec	92	27.46		
8.	Impressions taken should be disinfected?	Yes	335	100	
		No	0	0	
9.	Are you practicing these protocols	Yes	272	81.19	
		No	63	18.81	
10.	Will you practice these protocols post-covid 19	Yes	326	97.31	
		No	9	2.69	
11.	Till what time post covid-19 these protocols should be followed	6 months post covid-19	27	8.06	
		1 year post covid-19	43	12.84	
		2 years post covid-19	25	7.46	
		Always	239	71.34	

### 3. DISCUSSION

Dental patients who cough, sneeze, or receive dental treatment include using a hand spade or ultrasonic devices that cause their fluid, saliva, or

blood to aerosolize in the surrounding area. Dental implants can be contaminated with various pathogenic microorganisms after use or exposed in a contaminated environment. Thereafter, the infection may occur by piercing

sharp instruments or direct contact between contaminated mouth cells and hands.

Because of the distinctive signs of dental procedures in which large amounts of droplets and aerosols can be formed, conventional preventive measures in daily clinical work are not effective enough to prevent the spread of COVID-19, especially when patients in the incubation period do not know they are infected, or choose to hide.

Environmental hazards are an internal threat of dentistry, in which patients, doctors, assistants, cleaners, and all other staff members may be exposed. Dental services performed by dentists should always refer to the procedures for testing and prevention of the risks posed by the possible transmission of an infectious agent. Because of the transmission route, in addition to measures that prevent the spread of infection from patient to person or medical equipment and equipment (short-term infection), it may be advisable to add other respiratory and communication methods to normal hygiene procedures to reduce the risk of SARS-CoV-2 transmission.

In dental practice, prevention, control, and reduction of the risk of infection are usually made through:

- Use of protective equipment (PPE) such as gloves, masks, goggles, dental uniforms, and surgical clothing and shoes (see section on PPE below).
- A set of procedures for eliminating contamination, disinfection, and sterilization aimed at disabling, destroying, or removing germs from any area or equipment for dental surgery

To prevent SARS-CoV-2 infection, should monitor its airborne spread and droplet size (<5 μm or > 5 μm). Disease control measures should also take into account the potential for the virus to contaminate the environment. Although some details are not available, WHO reports that the persistence of the virus in higher areas may vary from a few hours to a few days with respect to environmental boundaries and the polluted environment. A very low humidity area is reported to reduce SARS-CoV-2 persistence.

SARS-CoV-2 virus is sensitive to ultraviolet radiation and heat. it can be stimulated at 56 °C 30 minutes, as well as lipid solvents such as

ether, 75% ethanol, and chlorine-containing antibiotics, peracetic acid, and chloroform. Resistant to chlorhexidine.

This article aim to focus on disinfection processes within the dental practice during the coronavirus epidemic [17].

### 3.1 Air Quality and Air Quality Management

- Maintain air and natural air circulation with regular window openings
- Use an independent air purifier to drain the room air into the atmosphere.
- The use of an indoor portable air purification system with a high air filter (HEPA) and UV light can be used.

### 3.2 Protocols to be Followed in Clinic Entrance, Reception and Waiting

- Display visual warnings at the entrance to the facility and in strategic locations (e.g., waiting areas or elevators) regarding respiratory hygiene, cough behavior, social isolation and littering.
- Ensure the availability of a three-layer mask and the cleaning of sewage and paper towels on the registration table, as well as nearby hand sanitation stations.
- Store dust bins in the waiting area, reception area, door and inside the clinic.
- All unfamiliar areas such as magazines, toys, TV remotes or similar articles.
- Preferred wireless / communication payment methods
- Bin A lid with a lid should be available at the point where patients can dispose of used tissue paper.
- Area A site dedicated to donating and pulling down PPE. Adequate and dedicated space should be secured for additional PPE and sterilization and disinfectants and chemicals.

### 3.3 Disinfection of Dental Clinic

#### 3.3.1 Environment and surface disinfection

- **Floors:** -Cleaning Procedure (Detergent and freshly prepared 1% sodium hypochlorite with a contact time of 10 minutes. Mop the floor starting at the far corner of the room and work towards the door. Frequency: after any patient/ major splash or two hourlyies.

- **Delicate Electronic equipment** Should be wiped with an alcohol-based rub/spirit (60-90% alcohol) swab before each patient contact.
- After the patient leaves the treatment room, the Assistant will collect all hand instruments immediately, rinse them in running water to remove organic matter and as per standard sterilization protocol.
- All 3 in 1 syringe, water outlets, hand piece, water pipelines, etc. should be flushed with the disinfectant solution for 30-40 seconds.
- Remove water containers and wash them thoroughly and disinfect with 1% sodium hypochlorite using clean cotton/ gauge piece and then fill with fresh 0.01% sodium hypochlorite solution and attach back to the dental chair.
- Disinfect the Dental Chair along with all the auxiliary parts within 3 feet of distance using 1% sodium hypochlorite and clean and sterilized cotton/gauge piece using inner to outer surface approach and leave for drying. A new cotton/ gauge piece should be used for every surface. The areas include:
  - a. Patient sitting area and armrests
  - b. Dental chair extensions including water outlets, suction pipe, hand piece connector, 3 in 1 syringe, etc.
  - c. Dental light and handle
  - d. Hand washing area –slab and tap nozzle
  - e. Clinic walls around the dental chair and switchboards
  - f. Hand washing area –slab and tap nozzle
- Hand pieces should be cleaned using a hand piece cleaning solution to remove debris, followed by packing in the autoclave pouches for autoclaving. Record to be maintained for the same.
- IMPRESSIONS will be thoroughly disinfected before pouring or sending to the laboratory using an appropriate disinfectant.
- Mop the floor with 1% sodium hypochlorite solution through separate mops for the clinical area following unidirectional mopping technique from inner to outer

area. Wash and disinfect the mop with clean water and 1% sodium hypochlorite and leave it for sun-drying. (Indahningrum 2020)

## 4. PROTOCOL FOR CLINIC CLOSURE

### 4.1 Fogging

It is used as '**No-touch surface disinfection**' and not for disinfection of air after a large area has been contaminated. The commercially available hydrogen peroxide is 11% (w/v) solution which is stabilized by 0.01% of silver nitrate. A 20% working solution should be prepared. The volume of working solution required for fogging is approximately 1000ml per 1000 cubic feet. After the procedure has been completed in the operatory (in case of no negative pressure), exit the room and close the operatory for half hour for the aerosols/droplets to settle down. Perform the 2 Step surface cleaning followed by fog. The fogging time is usually 45min, followed by a contact time/dwell time of one hour. After that, the room can be opened, fans can be switched on for aeration. Wet surfaces can be dried/cleaned using a sterile cloth or clean cloth (other surfaces). (Indahningrum 2020)

## 5. PROTOCOL FOR HEALTH CARE WORKERS ON REACHING HOME

- On the way back home, follow all precautions, starting from the removal of shoes; disinfecting your mobile, wristwatch, etc.; washing of clothes with hot water & Dettol antiseptic liquid followed by taking a bath with hot water. (Indahningrum 2020)

## 6. CONCLUSION

- The role of Pedodontists in preventing the transmission of COVID-19 is of paramount importance.
- The role of Pedodontists in defending covid19 is important. Additional studies or updates are required regarding antimicrobial agreements in dental practice during COVID-19

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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