

# Assessment of knowledge and attitude among pediatric dentists regarding spread and control of infection before and after COVID-19 crisis.

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## **ABSTRACT**

**Background:** *In this time of COVID-19 crisis, need of hour to appropriately perform dental procedures to reduce the spread of this deadly disease, it is importance to assess the knowledge and attitude of pediatric dentists regarding spread and control of infection before and after COVID-19 crisis.*

**Methods and Materials:** *Questionnaire-based survey composed of 6 questions that assess the knowledge of pediatric dentists regarding COVID-19 infection and 10 questions each designed to gather information about their clinical practice before and after COVID-19 crisis which shows attitude of pediatric dentists. Online survey link was circulated through social media and an e-mail to pediatric dentists from different locations in India and the responses were collected. 346 pediatric dentists willingly responded in the study.*

*Results: On grading the knowledge score according to the number of most appropriate responses chosen by the respondents, it was found that 82.4% of the pediatric dentist had good knowledge regarding the COVID-19 infection, 16.4% had fair and 1.2% had poor knowledge about it. The attitude regarding clinical practice of pediatric dentists, before and after COVID-19 crisis, is shown in percentage and was determined and compared using Chi-square test.*

*Conclusion: Our study presented data on the depth of knowledge and the attitude among the pediatric dentists' attitude regarding spread and control of infection before and after COVID-19 crisis it was quite acceptable.*

*Key words: Attitude, Corona virus, COVID-19, Infection control, Knowledge, Pediatric Dentists.*

### **Introduction-**

Beginning of 2020 drew the attention of entire world towards novel corona virus disease (COVID-19). Breakthrough of a COVID-19 began in Wuhan, China that has damaged the status of health and quality of life. On January 8, 2020, this novel corona virus was officially announced as the causative pathogen of COVID-19 infection by the Chinese Center for Disease Control and Prevention.<sup>1</sup>In India first case of COVID-19 infection was identified on 30 January in Kerala and now this infection has spread all around India.

The transmission COVID-19 infection occurs from person-to-person, either through direct transmission or via respiratory droplet through mucous membranes of the eyes, nose and saliva.<sup>2</sup>

Clinical symptoms of COVID-19 infection are still being documented, although majority of affected patients exhibit dry cough accompanied by fever, fatigue, and difficulty in breathing.<sup>3,4,5</sup>

COVID-19 have different stages infection like asymptomatic, mild, moderate, severe and critical.<sup>6</sup>Children usually present with mild nonspecific symptoms, or can be asymptomatic hence asymptomatic and severe patient are considered as potential carrier of SARS-CoV-2.<sup>7</sup>

Literature reported that dentists are at higher risk for acquiring COVID-19 infection due to high exposure to droplet derived from aerosol generating procedures (AGPs).<sup>8</sup>Among the dental practitioners, pediatric dentist are at higher risk for acquiring COVID-19 infection because they come in contact with children and their parents. Therefore it is necessary to assess knowledge of pediatric dentist and their attitude towards infection control protocol to curbs the spread of COVID-19 infections.

Thus the present study was intended to assess the knowledge and attitude of pediatric dentists towards infection control protocol in their clinical practice before and after COVID-19 crisis.

### **Materials and Methods**

The study was conducted in the Department of Pediatric and Preventive Dentistry after approval from institutional ethics committee. Pre-validation of the questionnaire was done by conducting a pilot study on 20 pediatric dentists. The cross-sectional study was conducted using online survey questionnaire from 20th may to 20th june 2020. The online survey link was circulated through social media and an e-mail to pediatric dentists from different locations in India and the responses were collected. A total of 346 pediatric dentists willingly responded the survey. The

questionnaire was comprised of a total of 26 closed-ended questions, which were divided into two sections. The first section comprised 6 questions that assess the knowledge of pediatric dentists regarding COVID-19 infection (Table 1). All questions were marked mandatory with only one response allowed to be chosen for every question. Each most appropriate answer in relation to the knowledge of COVID-19 was given one point. The total knowledge score for a respondent varied between 0 (with no correct answer) to 5 (for all correct answers). The score  $\leq 2$  was interpreted as poor knowledge, score 3 to 4 as fair and 5 as good knowledge.

Second section was designed to gather information about their clinical practice before and after COVID-19 crisis. There were 10 questions each for before and after COVID-19 crisis (Table 2). For each question, the percentages of pediatric dentists choosing every option were calculated. After determining the percentages for each habit, the comparisons were made between before and after COVID-19 crisis.

**Table 1: Questionnaire with the choice of responses regarding the knowledge of pediatric dentists about the COVID-19 infection**

Sr. No.	Questions	Options	Percentage of response of pediatric dentists (%)
1.	Are you aware of COVID-19 infection?	Yes	100
		No	0
2.	COVID-19 infection is caused by?	Bacteria	0
		Virus	100
		Fungi	0
		All the above	0
3.	What is the incubation period of COVID-19 infection?	1-14 days	84.1
		7-14 days	8.7
		1-10 days	5.2
		1-5days	2
4.	Which system is affected by corona virus infection that can lead to death?	Renal system	10.7
		Cardiovascular system	6.1
		Central nervous	1.7

		system	
		Respiratory system	81.5
5.	What are the symptoms of infected COVID- 19 patients?	Cough	2
		Fever	0.3
		Shortness of breath	2.3
		All of the above	95.4
6.	Do you think children are the silent carrier for corona virus?	Yes	85.2
		No	3.8
		Not sure	11

**Table 2: Assessment of change in the attitude of pediatric dentists towards the clinical practice before and after COVID-19 crisis in India**

Sr. no	Questions	Options	Before COVID-19 crisis (%)	After COVID-19 crisis (%)	p value
1.	Check temperature of every pediatric patient and their parents reporting to your clinic/institution/hospital	Yes	21.1	89.5	22.5 <0.0001*
		No	56.4	1.2	
		Sometimes	22.5	9	
2.	Wash or sanitize pediatric patients and their parents hand at the entry point of clinic	Yes	22.5	90.5	<0.0001*
		No	54.6	0.6	
		Sometimes	22.8	9	
3.	Wearing masks pediatric patients and their parents before entering the dental clinic/institution/hospital	Yes	22.8	91	<0.0001*
		No	73.1	0	

		Sometimes	4	9	
4.	Use of personal protective equipment (PPE) kit while treating pediatric patient	Yes	21.4	82.7	<0.0001*
		No	74.6	0.9	
		Some times	1.4	0.9	
		Depend upon case	2.6	15.6	
5.	Use of face shield to protect yourself from aerosol	Yes	58.4	91	<0.0001*
		No	4.9	0	
		Some times	11.8	0	
		Depend upon case	24.9	9	
6.	Provide face shield to assistant during dental treatment	Yes	56.4	86.1	<0.0001*
		No	8.7	2.3	
		Some times	15.9	0.3	
		Depend upon case	19.1	11.3	
7.	Clean the clinical area (dental chair and working area) after treating each patient	Yes	57.5	94.5	<0.0001*
		No	2.6	0.3	
		Some times	26.6	0.6	
		Depend upon case	13.3	4.3	
8.	How often you fumigate dental clinic /institute/hospital?	Don't fumigate	61.8	2.3	<0.0001*
		Weekly	22.3	85.3	
		15 days	3.8	10.7	

		Monthly	12.1	1.7	
9.	Use of mouth-rinses for pediatric patient before start of treatment	Yes-every patient	22	92.2	<0.0001*
		No	40.8	1.2	
		Sometimes	18.5	2	
		It depends on the oral hygiene	18.8	4.6	
10.	Use of rubber dam regularly for treating pediatric patient	Yes-every patient	17.3	76.3	<0.0001*
		No	42.2	2.6	
		Sometimes	20.8	2.9	
		It depends on the oral hygiene	19.7	18.2	

### Statistical Analysis

Statistical analysis was carrying out on SPSS v 16.0 software. For the first part, the mean knowledge scores were determined. For the second part, percentage of people choosing each option were determined and compared before and after COVID-19 crisis using Chi-square test. The difference was considered to be statistically significant if p value <0.05.

### Results

On grading the knowledge score according to the number of most appropriate responses chosen by the respondents, it was found that 82.4% of the pediatric dentist had good knowledge regarding the COVID-19 infection, 16.4% had fair and 1.2% had poor knowledge about it (Table 3).

**Table 3: knowledge score among pediatric dentist**

Score	Percentage of respondents
<b>Good</b>	82.4
<b>Fair</b>	16.4
<b>Poor</b>	1.2

Before the COVID-19 crisis less than 25% of pediatric dentist recommended temperature check, sanitizing of hands at entry, wearing of masks and use Personal protective equipment (PPE) kit during treatment. However, after COVID-19 crisis more than 90% of pediatric dentist recommended assessing temperature at entry, sanitizing hands, wearing of masks and use of PPE kit during treatment, the difference was statistically significant. Almost 50% of the pediatric dentist before COVID -19 crises recommended use of face shield during treatment for himself and assistant, however after COVID crises majority of pediatric dentist recommends face shield during treatment for himself (91.0%) and assistant (86.1%). Before COVID -19 crisis almost 58% of pediatric dentist cleaned dental chair and working area after every patient, this percentage of pediatric dentist increases to 91% after COVID -19 crisis. Surprisingly, 61.8% of pediatric dentist didn't fumigated dental clinic before COVID-19 crisis, in contrast 85.3% respondent believes that weekly fumigation needed in dental clinic after COVID-19 crisis. Less than 25% of pediatric dentists were using mouth-rinses and rubber dam for treating pediatric patients before the COVID-19 crisis that had increased to more than 75% after the COVID-19 crisis (Table 3).

The statistically significant difference is observed in the attitude of pediatric dentists towards the clinical practice before and after COVID-19 crisis.

### **Discussion**

The rapidly growing literature on the disastrous outbreak of COVID-19 in 2020 has already made us aware of the calculated risks that healthcare professionals are bound to face at their workplaces. Pediatric dentists working at their clinics are no exceptions to these risks, rather are considered to be sometimes even at higher risks due to the frequently contact with children's and their parents that make higher risk to COVID-19 infection. The ideas in this study are not meant to provide solutions, but raise questions that need discussion so we as pediatric dentists can mutually arrive at plans to be better prepared in the future.

The study provides the level of knowledge and attitude of pediatric dentists regarding spread and control of infection before and after COVID-19 crisis. While all the pediatric dentists were aware of COVID 19 infection and about the causative virus for it, not all were still familiar with this basic information. Likewise, although an admirable proportion of pediatric dentist (84.1%) had the knowledge about the intubation period of the COVID-19 infection. Approximately more than 80% of the pediatric dentists were aware about the symptoms, cause of death and children's are silent carrier of COVID -19 infections.

This pandemic crisis has forced pediatric dentists to think about new way to look at the dentistry in post-COVID-19 world.

Among the clinical features of COVID-19, fever<sup>9</sup> is most common, so measuring body temperature of each and every pediatric patient and their parent can prevent the spread of COVID-19 infection. In our study, majority of the pediatric dentists (89.9%) believes that the temperature check at entry to dental clinic can control the spread of COVID-19 infections.

Dental clinics are closed chamber clinic which harbors nourishing environment for severe acute respiratory syndrome corona virus and Middle East respiratory syndrome corona virus like viruses. Therefore, washing hands or sanitizing hands at entry and wearing mask in dental clinic reduces the risk of aerosol spread of infection.<sup>10, 11</sup> In the current study majority of the pediatric dentist agrees that wearing mask and sanitizing hands at entry reduces the risk of transmission. But still approximately 9% of the population believes that wearing mask and sanitizing hands at entry is not a recommended option to curb the menace of COVID -19 infections.

Personal protective equipment kit has been known to protect eyes, mouth, nose and skin from microbial contamination. But hardly 21% of the pediatric dentists were using PPE kit during treatment. The possible reason for non-use of PPE kit is the anxiety of children for PPE kit which makes them un-cooperative. However, after COVID-19 crises majority of the pediatric dentist wants to use PPE kit during treatment. The possible reason for use of PPE kit after COVID-19 crisis might be the anxiety of the pediatric dentist of being getting contaminated with infections. It is further stated that anxiety of the children related to PPE kit can be overcome by showing video demonstration or by education of children related to PPE kit.

Aerosol generating procedures are intrinsic to the routine dental practice. Pediatric dentists no exception for this, so to protect eyes, nose and mouth from the aerosol use of face shield is highly recommended.<sup>12,13</sup> Pediatric dentist had limited use of face shield by himself and they also think there is no need to provide assistant before COVID-19 crisis. Probably they may think assistant have limited exposure to aerosol compare to pediatric dentists so, there is no need to provide face shield. But, after COVID-19 crisis majority of the pediatric dentists (86.1%) opinion that there is also need to provide face shield to assistant to prevent the transmission of such life threatening infectious disease. American Dental Association (ADA)<sup>14</sup> also agree with use of face shields by Dental Health-care Personnel.

The preventive infection control measures that must be followed by pediatric dentist. Such as cleaning of clinical area and fumigation in dental clinic these basic steps helps to avoid transmission of the diseases. Pediatric dentist barely clean clinical area and fumigation done in dental clinic before COVID-19 infection. Pediatric dentist may think after cleaning all the surfaces there is no need to perform fumigation in dental clinic. But, after COVID-19 infection majority of pediatric dentists thinks cleaning of clinical area and fumigation in dental clinic is necessary to prevent spread of disease. This surely suggests that pediatric dentists changed attitude look towards cleaning of clinical area and fumigation in dental clinic.

Preoperational antimicrobial mouth rinse reduces the oral microbes present in the patient mouth. Pediatric dentists scarcely uses of preoperational mouth rinses before the COVID-19 infection, probable reason behind this taste of mouth rinses so difficult to achieve co-operation of patient. However, after COVID-19 crises majority of pediatric dentists (92.2%) recommend the use preoperational mouth rinses for the prevention of spread of the diseases. But, Guideline for the Diagnosis and Treatment of Novel Corona virus Pneumonia (5th edition) suggest that chlorhexidine, which is commonly used as mouth-rinse in dental clinic, may not be effective to

kill coronavirus.<sup>3</sup> Corona virus is vulnerable to oxidation, preoperational mouth rinse containing oxidative agents like 1% hydrogen peroxide or 0.2% povidone is recommended.<sup>3</sup>

Application of rubber dam can significantly reduce the production of aerosol, mainly in case of high-speed hand-pieces and dental ultrasonic devices are used. It has been reported that the application of rubber dam could significantly reduce airborne particles in ~3-foot diameter of the operational field by 70%.<sup>15</sup> But, in current study only 17% pediatric dentists used rubber dam routinely before COVID-19 crisis. Limited use of rubber dam may be due to patient's lack of acceptance of clamp. This also supported by Feierabend et al. study, in which 97% of respondents reported that patients does not like rubber dam.<sup>16</sup> In contrast to this, there is evidence that many patients prefer rubber dam application.<sup>17</sup> However, dentists' motivation and positive attitude towards rubber dam is a factor that influences patients' attitudes toward rubber dam application, thereby increasing patient acceptance.<sup>19</sup> After COVID-19 crisis pediatric dentists' (76%) prefer to use of the rubber dam. Majority of the pediatric dentists are reported taking sufficient measures for the prevention of spread of COVID-19 infection in the dental clinics. The limitations of the study were a cross-sectional design and limited geographical area undertaken. Also, age, gender and experience of the pediatric dentists were not considered during the assessment of their knowledge and attitude of pediatric dentists regarding spread and control of infection before and after COVID-19 crisis. However, this study definitely creates the platform for researchers and policy makers to realize the need and bring in rapid developments in this concern.

### **Conclusion:**

Our survey presented data on the depth of knowledge and the attitude among the pediatric dentists' attitude regarding spread and control of infection before and after COVID-19 crisis. Clinical guidelines that can be revised to practice safety measures at the dental clinics and limit the spread of the deadly disease.

**Acknowledgement:** We acknowledge the generous participation of Pediatric Dentists of India in our survey.

**Financial support and sponsorship:** Nil

**Conflicts of interest:** There are no conflicts of interest.

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