

# Awareness, Perception, Attitude Regarding CoViD -19 and Infection Control among Indian Pediatric Dentists: A Cross Sectional Study

Viral Maru\*/ Dimple Padawe\*\*/ Asha Singh\*\*\*/ Vilas Takate\*\*\*\*/ Kishor Dighe\*\*\*\*\*/ Sunit Singh\*\*\*\*\*

**Aim:** The rapid and extensive spread of CoViD -19 pandemic has become a major source of concern for healthcare system including pediatric dentists. The aim of the present study was to assess the awareness, perception and attitude regarding CoViD – 19 and infection control among Indian pediatric dentists. **Study design:** A total of 1009 Indian Pediatric dentists completed questionnaire based survey on the awareness, perception and attitude regarding CoViD – 19 infection and its control. Descriptive statistics have been used in the study to analyze the findings. Mean and standard deviation and proportion have been used to estimate the results of the study. **Results:** 65.75% Indian pediatric dentists had answered questions regarding CoViD – 19 infection correctly. The present survey found a positive perception among Indian pediatric dentist regarding CoViD – 19 and infection control. However the attitude among Pediatric dentist regarding the same was not encouraging. **Conclusion :** As the global threat of CoViD-19 continues to emerge, it is critical to improve the awareness, perceptions and attitude of pediatric dentists. Educational interventions are urgently needed to reach pediatric dentists beyond borders, and further studies are warranted.

**Keywords:** Indian pediatric dentists, CoViD – 19 infection, survey.

## INTRODUCTION

Coronavirus (CoV) infections are emerging respiratory viruses and are known to cause disease ranging from the common cold to severe acute respiratory syndrome (SARS)<sup>1</sup>. CoV is a zoonotic pathogen that can be transmitted via animal-to-human and human-to-human interaction.<sup>2</sup> Multiple epidemic outbreaks occurred during 2002 (SARS), with ~800 deaths, and 2012 (Middle East Respiratory Syndrome: MERS-CoV), with 860 deaths<sup>3</sup>. Approximately eight years after the MERS-CoV epidemic, the current outbreak of novel coronavirus (CoViD-19) in Wuhan City, Hubei Province, China, has emerged as a global outbreak and significant public health issue.<sup>4</sup> On 30 January 2020, the World Health Organization (WHO) declared CoViD-19 a public health emergency of international concern (PHEIC)<sup>5</sup>.

At present no antiviral treatment or vaccine has been discovered for CoViD-19. Therefore, applying preventive measures to control CoViD-19 infection is the most critical intervention. Healthcare Workers (HCWs) are the primary sector in contact with patients and are an important source of exposure to infected cases in healthcare settings; thus, HCWs are expected to be at high risk of infection. According to WHO, the dental surgeons among the health care workers around the globe posed a major exposure risk to CoV infections.<sup>5</sup>

The UK National Health Service's (NHS's) initial view was that dentists and their teams should continue to provide routine care for asymptomatic patients with no close contact history and

From Department of Pediatric Dentistry Government Dental College and Hospital, Mumbai, India

\*Viral Maru, MDS, MBA, Associate Professor.

\*\*Dimple Padawe, MDS, MBA,,Senior Professor and Head of Department.

\*\*\*Asha Singh, MDS,,Professor.

\*\*\*\*Vilas Takate, MDS,,Assistant Professor.

\*\*\*\*\*Kishor Dighe, MDS, Assistant Professor.

\*\*\*\*\* Sunit Singh, MDS, Dental Surgeon.

to discourage symptomatic patients from attending. Meanwhile, many general dental practitioners and dental specialists in India felt uncomfortable with this advice and felt a moral duty to reduce routine care for fear of spreading the CoViD-19 infection among their patients and beyond. They were also understandably concerned, if self-employed, about the personal financial consequences. The advice to continue with routine dental care did not seem logical given the social distancing and complete lockdown measures that were introduced for the population by the Indian government.

On the other hand, by the end of January 2020, the WHO and Centers for Disease Control and Prevention (CDC) had published recommendations for the prevention and control of CoV infection for HCWs.<sup>7,8</sup> The Indian government also initiated several online training sessions – integrated Government Online Training (iGOT) on CoViD-19 infection to strengthen preventive strategies, including raising awareness and training Indian healthcare workers including general dentist in preparedness activities.<sup>9</sup> This provided a unique opportunity to investigate the level of knowledge regarding CoViD-19 infection among pediatric dentists since they form a significant population among HCWs in India. PubMed search did not show any studies related to awareness, perception and attitude regarding CoViD-19 among pediatric dentists. Hence the aim of the present study was to assess the awareness, perception, attitude regarding CoV infection and its control among Indian pediatric dentist through a Web based cross sectional, observational questionnaire survey.

## METHOD

The present Web-based cross-sectional study was conducted using a survey instrument to obtain responses from Indian pediatric dentists from 16<sup>th</sup> April, 9.00 am to 22<sup>nd</sup> April 2020, 9.00am IST. The eligibility criteria for participants included – Indian pediatric dentist by qualification attached to private clinical practice or as academicians or both. A 20-item survey instrument was developed using WHO course materials on emerging respiratory viruses, including CoViD-19 infection<sup>10</sup>. The survey covered the domains of Indian pediatric dentist's demographics and general characteristics, awareness, information sources, knowledge perceptions and attitude related to CoViD-19 infection and its control. The developed draft survey instrument was distributed to ten randomly selected faculty members to assess its readability and validity before pretesting among 20 randomly selected Indian pediatric dentist for clarity, relevance, and acceptability. Refinements were made as required to facilitate better comprehension and to organize the questions before the final survey was distributed to the study population.

## Study Tool

An online semi structured questionnaire was developed by using google form, with a consent form appended to it. The link of the questionnaire was send through emails, WhatsApp and other social media (Facebook, Twitter, Youtube, Snapchat) to the contacts of the participants. On receiving and clicking the link the participants got auto directed to the information about the study and informed consent. After they accepted to take the survey they filled up the demographic details. Then a set of several questions appeared sequentially, which participants were to answer. The demographic variables included name ( optional ) age, gender, area of practice, years and type of work experience. The survey had three sections

– 1] awareness about CoViD-19 infection, 2] perception about CoViD-19 infection and 3] attitude regarding CoViD-19 infection control containing eleven, four and five multiple choice questions respectively. Each question had 4 options and the participants were expected to select any one of them.

## Ethical considerations

The institutional ethics committee reviewed and approved the present study. Confidentiality of the survey participant's information was maintained throughout the study by making the participants' information anonymous and asking the participants to provide honest answers. Eligible pediatric dentist's participation in this survey was voluntary and was not compensated. The study was conducted following the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines.<sup>10</sup>

## Statistical Analysis

Descriptive statistics have been used in the study to analyze the findings. Mean and standard deviation and proportion have been used to estimate the results of the study.

## RESULTS

A total of 1009 pediatric dentists across India had participated and completed questionnaire based survey on awareness, perception and attitude regarding CoViD -19 and infection control. 62.1% and 37.9% of responders were females and males respectively. The mean of participants was  $44.09 \pm 8.83$  years. In the present survey 30% pediatric dentists were working exclusively as clinicians whereas 12.5% as exclusive academicians and 57.5% as both—clinicians and academicians. The distribution all the participants across India in percentage is represented (Figure 1) The results regarding awareness (Figure 2A and 2B), perception (Figure 3) and attitude (Figure 4) of pediatric dentists regarding CoViD -19 and infection control is represented.

Figure 1: Location of pediatric dentists.

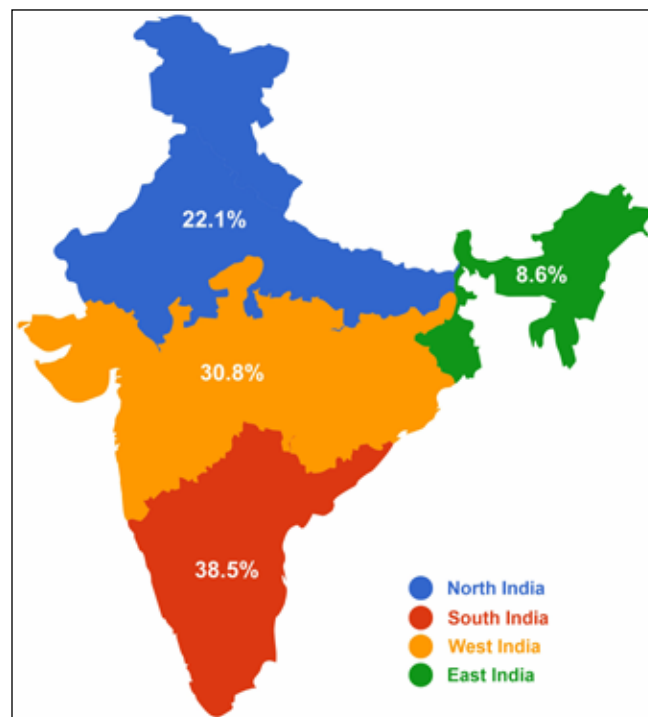


Figure 2A: Awareness of Indian Pediatric dentists regarding CoViD-19 and infection control.

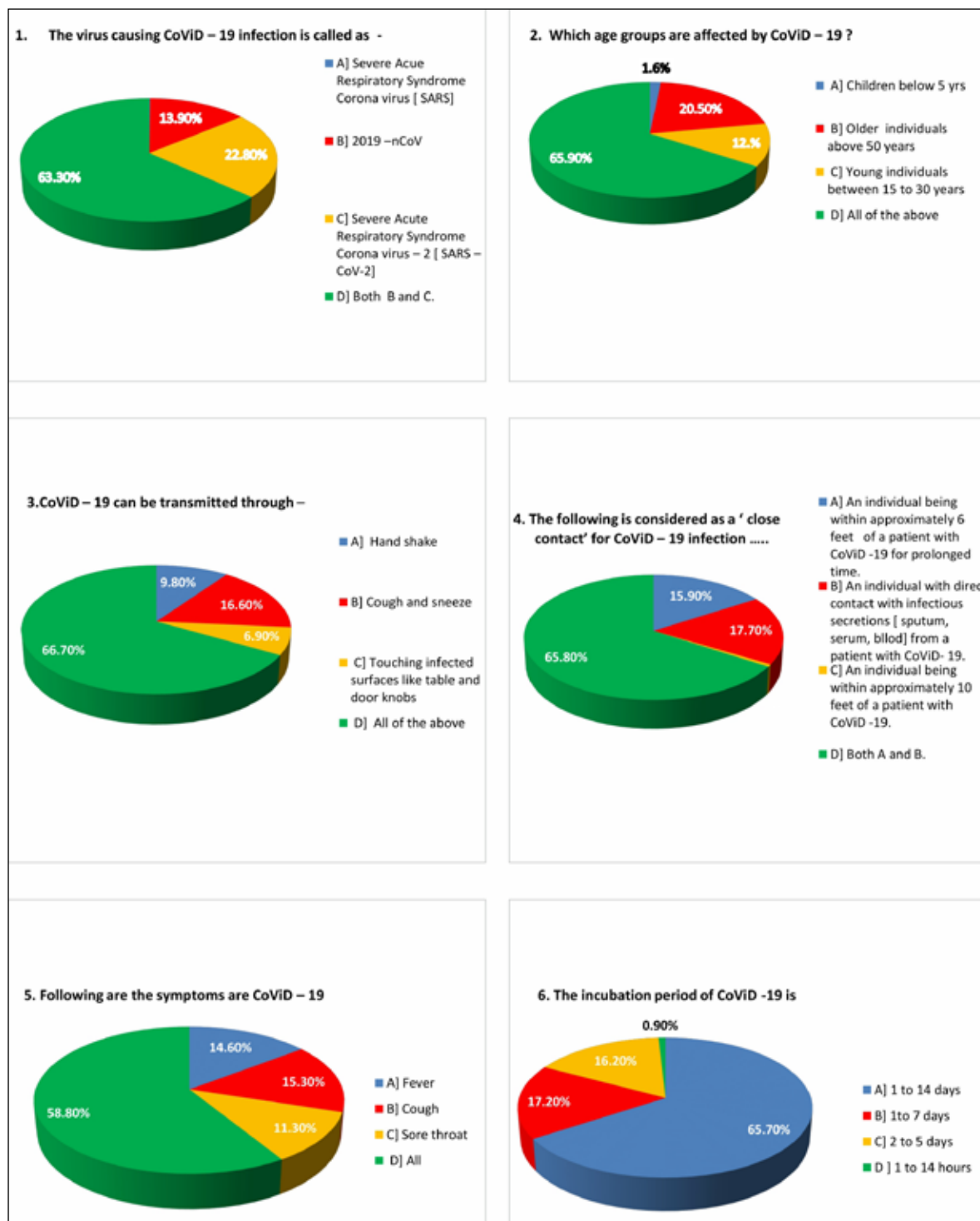


Figure 2B: Awareness of Indian Pediatric dentists regarding CoViD-19 and infection control.

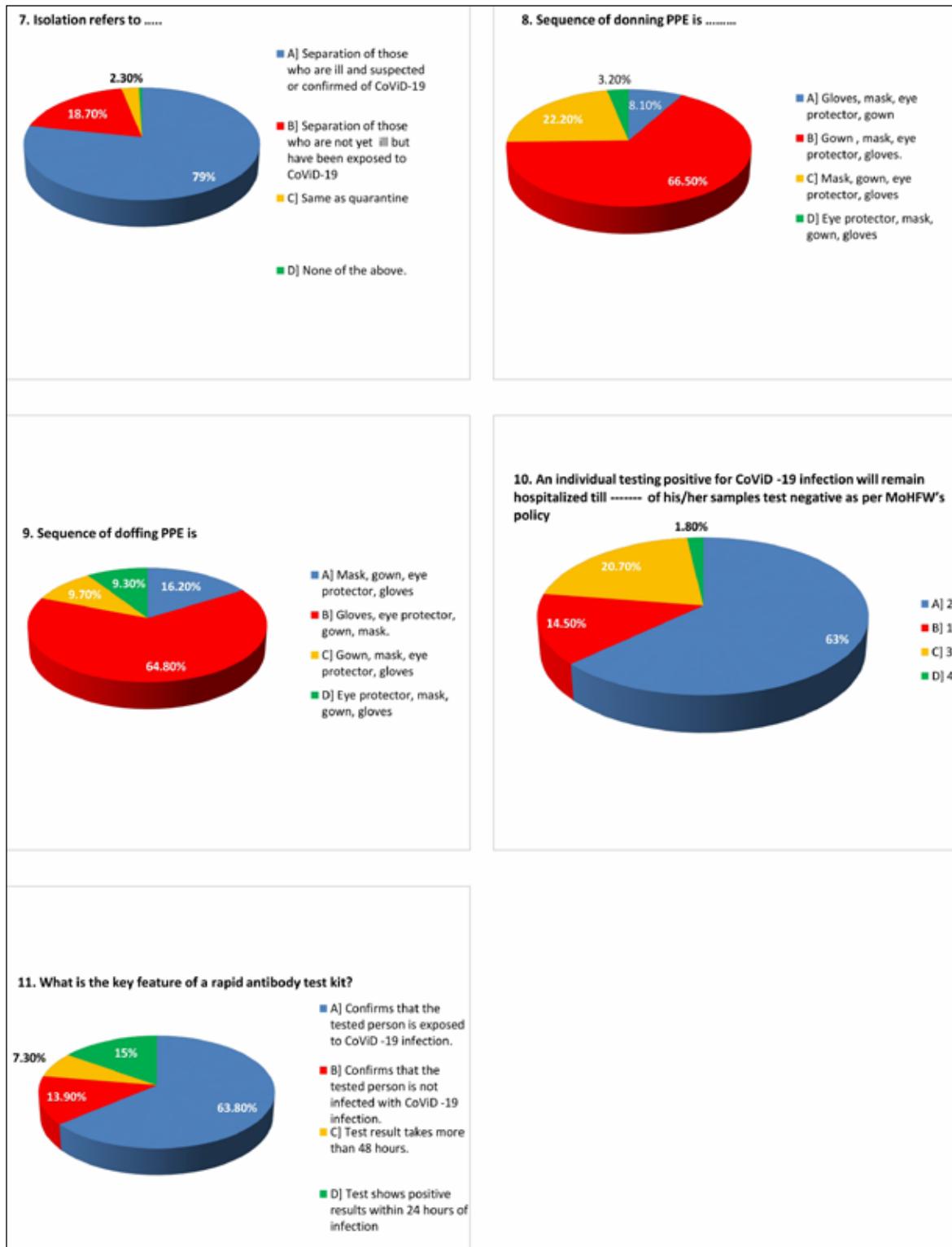


Figure 3: Perception of Indian Pediatric dentists regarding CoViD-19 and infection control.

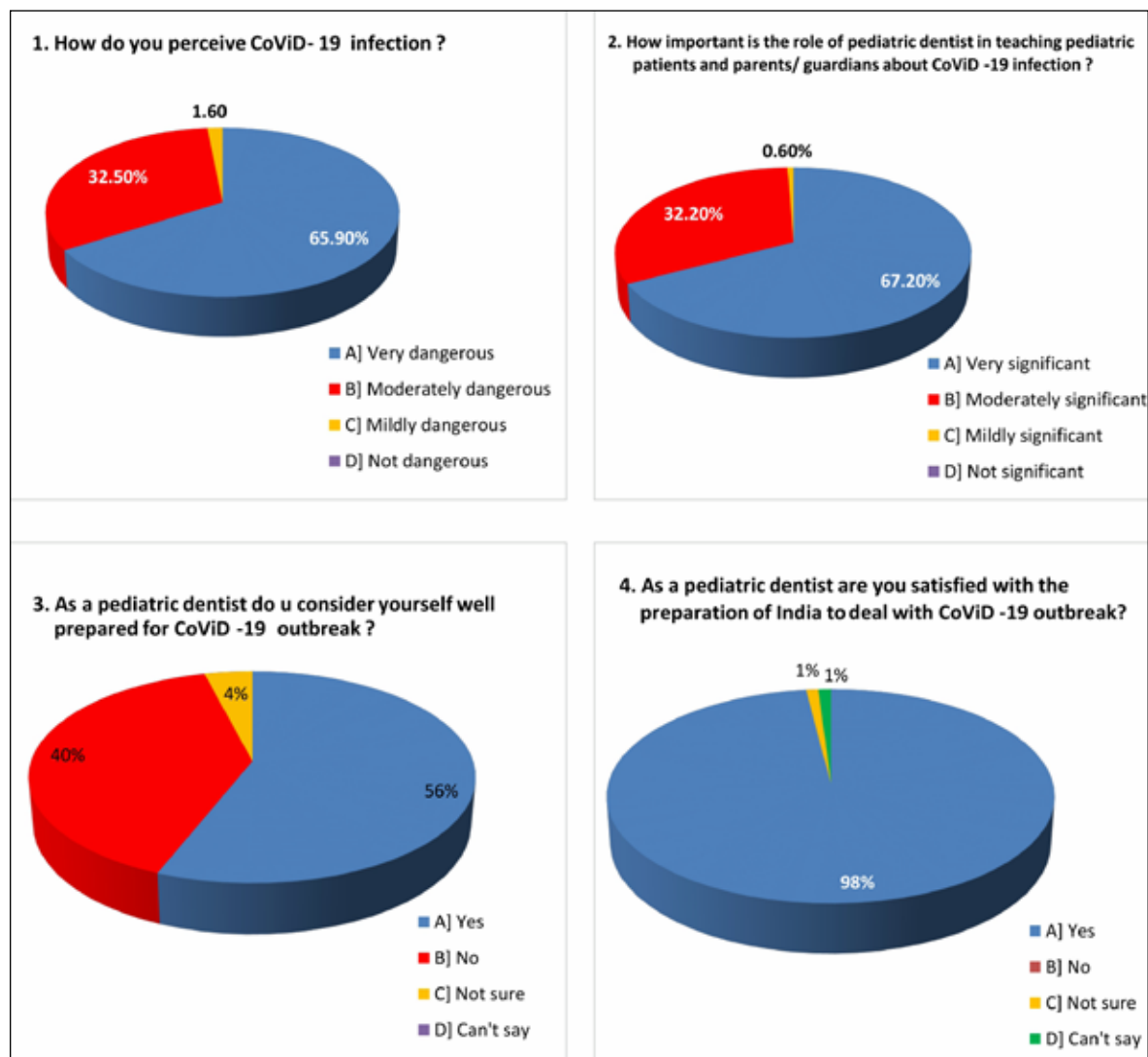


Figure 4: Attitude of Indian Pediatric dentists regarding CoViD-19 and infection control.

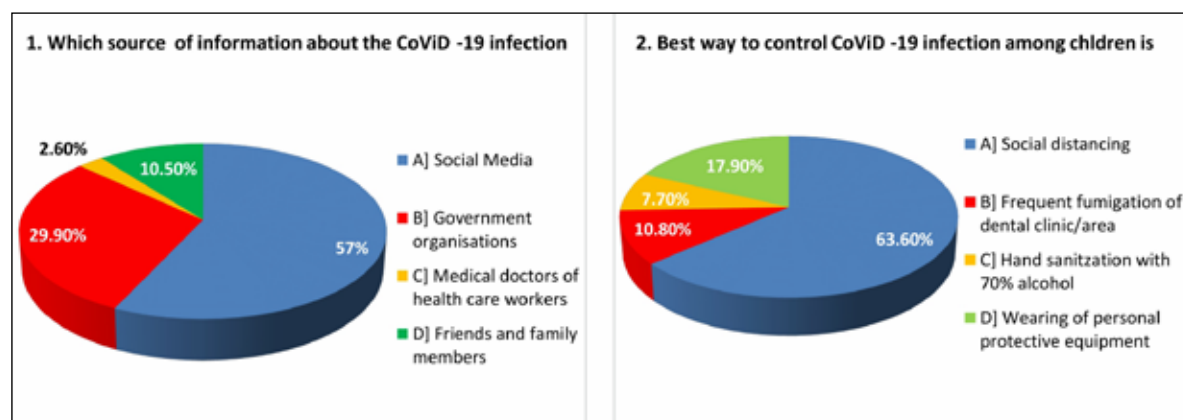
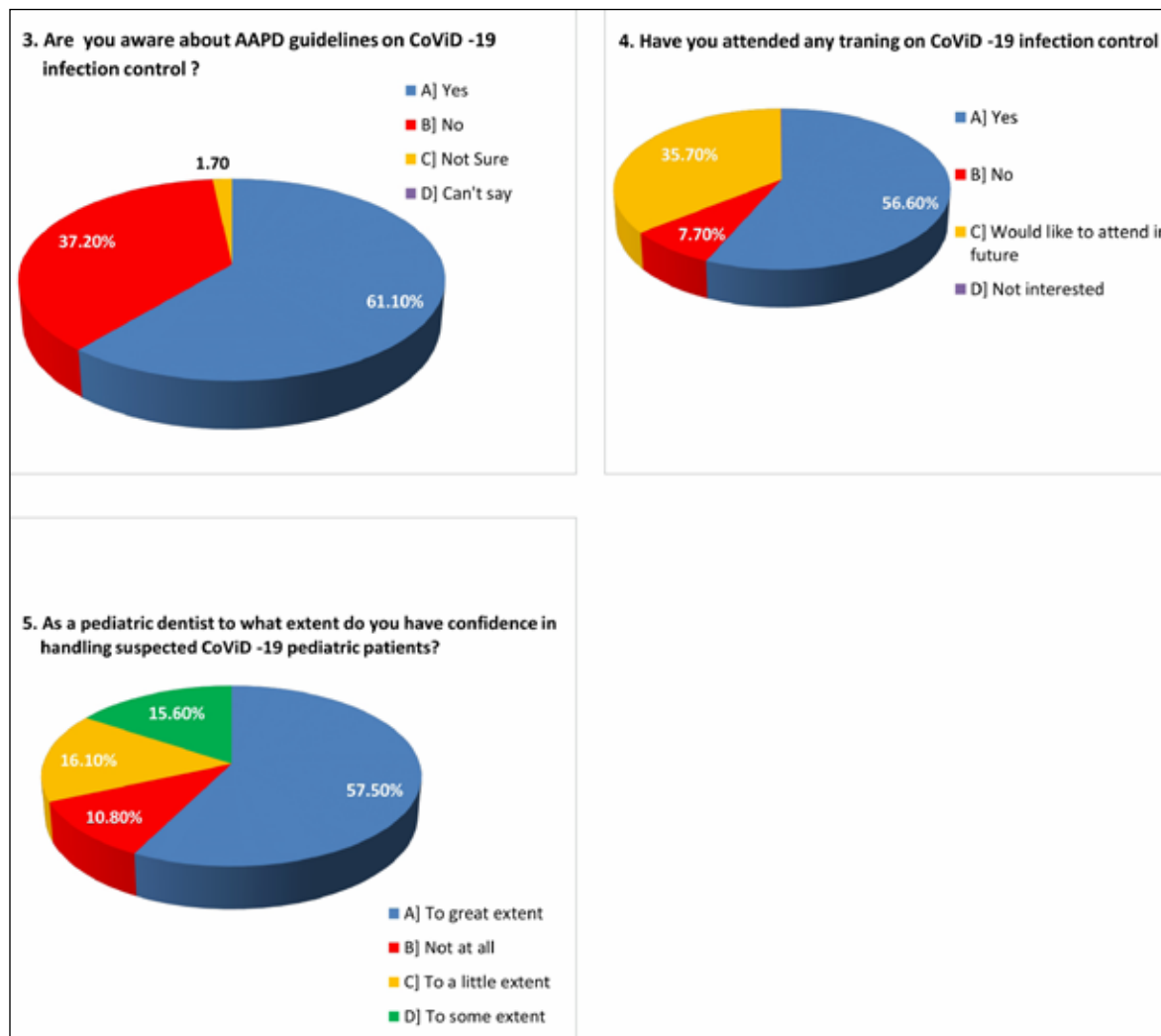


Figure 4: Attitude of Indian Pediatric dentists regarding CoViD-19 and infection control (continued).



**DISCUSSION**

At present, CoViD – 19 infection is a global topic of discussion in the media and among the public, especially among HCWs including pediatric dentists and patients. With the currently mounting CoViD-19 transmission raising tensions for everyone, including health care officials and health systems, an important question arises regarding how we manage information to help frontline pediatric dentists in times of public health crisis. For this reason, we investigated Indian pediatric dentists knowledge, perceptions and attitudes regarding CoViD – 19 infection during a global epidemic. As per PubMed literature search, the present survey is first survey to be carried out among pediatric dentists regarding CoViD – 19 infection.

The novel coronavirus belongs to a family of single-stranded RNA viruses known as Coronaviridae. There is strong evidence that this novel coronavirus has similarity to coronavirus species found in bats and potentially pangolins, confirming the zoonotic nature of this new cross-species viral-mediated disease. As the published genome sequence for this novel coronavirus has a close resemblance with other beta-coronaviruses such as SARS-CoV and MERS-CoV, the Coronavirus study group of the International Committee on Taxonomy of Viruses has given it the scientific name SARS-CoV-2,

even though it is popularly called the CoViD-19 (Corona Virus Disease 2019) virus.<sup>11-12</sup> In the present survey, 63.3% of Indian pediatric dentist were aware about this information. 36.7% Indian pediatric dentists did not know that that CoViD – 19 infection is also known as SARS – CoV -2.

In the present survey 65.9% Indian pediatric dentist were aware that people of all ages can be infected by the CoViD – 19 infection. Older people and individuals with pre existing medical conditions [such as asthma, diabetes, heart disease] appear to be more vulnerable to becoming severely ill with this infection due to compromised immunity.<sup>7</sup>

65.8% Indian pediatric dentists knew the US CDC, definition for a “close contact” as “being within approximately 6 feet (2 meters) of a CoViD-19 case for a prolonged period of time or having direct contact with infectious secretions of a CoViD-19 case. Similarly, various other key definitions have been provided in Interim U.S. guidance for risk assessment and public health management of healthcare personnel with potential exposure in a healthcare setting to patients with Coronavirus Disease (CoViD-19) published by the CDC.<sup>13</sup>

66.7% Indian pediatric dentist had knowledge about the different routes of transmission of CoViD – 19 infection. It typically spreads through respiratory droplets or by contact. Therefore,

coughing or sneezing by an infected person can render infection, potentially infecting individuals in close contact (within a radius of approximately 6 feet). This led to the recent recommendation of social distancing to minimize community spread of the disease. Hence 63.6% Indian pediatric dentists preferred social distancing as the best way to control this infection among children. Another important route of transmission is if droplets of CoViD-19 lands on inanimate objects located nearby an infected individual and are subsequently touched by other individuals. Thus, disinfection of objects and handwashing are essential for halting the spread of this disease. This recommendation is strengthened considering that people touch their face on an average of 23 times per hour, with 44% of these occurrences involving the mucous membranes of the mouth and/or nose. In addition, studies have shown the presence of CoViD -19 in both saliva and feces of the affected patients. It is known that CoViD-19 can bind to human angiotensin-converting enzyme 2 receptors, which are highly concentrated in salivary glands; this may be a possible explanation for the presence of this virus in secretory saliva. Therefore, there is a potential for transmission of CoViD-19 via aerosol, fomites, or the fecal-oral route that may contribute to nosocomial spread in the dental office setting.<sup>14-18</sup> This could be the reason why 10.8% and 7.7% Indian pediatric dentists preferred fumigation of dental clinic/area and hand sanitization with 70% alcohol respectively as the best way to control infection among children.

58.8% Indian pediatric dentist were aware about the symptoms of CoViD 19 infection—fever, dry cough and sore throat. In addition, less obvious symptoms such as nausea, diarrhea, reduced sense of smell (hyposmia), and abnormal taste sensation (dysguesia) have also been reported. In addition, abnormal chest X-ray and computed tomographic findings such as ground-glass opacities are typically found in the chest. Notably, about 80% of these patients have only mild symptoms that resemble flulike symptoms and seasonal allergies, which might lead to an increased number of undiagnosed cases. These asymptomatic patients can act as “carriers” and also serve as reservoir for re- emergence of infection. Although CoViD-19 is known to be highly transmissible when patients are most symptomatic, it is noteworthy that the incubation period can range from 1 to 14 days, therefore transmission can occur before any symptoms are apparent.<sup>19-20</sup> According to the present survey 65.7% Indian pediatric dentists were well aware about the incubation period of CoViD infection.

Indian government has used the policy of quarantine to stop the spread of this contagious infection. Quarantines are for people or groups who don't have symptoms but were exposed to infection. A quarantine keeps suspected individuals away from others so they don't unknowingly infect healthy individuals. Quarantines are most commonly used during outbreaks, epidemics and pandemics. While isolation serves the same purpose as quarantine, its reserved for those who are already infected with CoViD -19. It keeps the infected individuals away from healthy individuals to prevent the infection from spreading.<sup>7</sup> According to present survey 79% Indian pediatric dentists knew the difference between isolation and quarantine.

According to CDC's 2004 guidance for the selection and use of Personal Protective Equipment (PPE) in healthcare settings, ' standard precautions are intended to prevent the transmission of common infectious agents to healthcare personnel, patient and

visitors in any healthcare settings.<sup>7</sup> The correct sequence of donning (Figure 5) and doffing (Figure 6) is explained.<sup>21</sup> 66.5% and 64.8% Indian pediatric dentist knew the correct sequence of donning and doffing PPE respectively.

63.8% Indian pediatric dentists knew that rapid antibody test, detects the presence of patient generated antibodies against SARS – CoV -2, the virus which causes the disease CoViD -19. This test can detect two types of antibody isotypes: IgG and IgM. IgM antibodies are the first antibodies in response to a novel antigen. They imply more recently initiated infection. IgG antibodies have a higher affinity for the target antigen, meaning they are more specifically able to bind the substance which caused the immune response. IgG antibodies are generated later in the course of infection. IgG and IgM antibodies can both be present in a sample. This implies that the conversion from a primarily IgG to IgM humoral response is underway. A sample can be positive if IgM, IgG or both antibodies are present.<sup>8</sup>

Every disease has a treatment protocol that is almost universally accepted and followed. However, CoViD – 19 is a new disease and such protocol is yet to be universally formulated. Different affected countries have adopted slightly different protocols to recommend discharge of a novel coronavirus patient. Indian government, Ministry of Health and Family Welfare ( MoHFW) recommends discharging CoViD -19 patients if they don't have fever for three

**Figure 5: Centers for Disease Control and Prevention recommendations for putting on personal protective equipment for treating COVID-19 patients.**



From: <https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf>. Site accessed April 22, 2020.

**Figure 6: Centers for Disease Control and Prevention recommendations for removing personal protective equipment for treating COVID-19 patients.**



From: <https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf>. Site accessed April 22, 2020.

days, show improved respiratory symptoms, reduced inflammation in respiratory tracts and tests negative twice in consecutive samples taken at least 24 hours apart. According to present survey 63% Indian pediatric dentists were aware about this protocol.<sup>22</sup>

According to present survey 65.75% Indian pediatric dentists had answered questions regarding CoViD – 19 infection correctly. This collaborated with the findings of Pranav M and associates who reported that 71.2% Mumbai, India healthcare students and professionals could answer the question regarding CoViD-19 infection correctly.<sup>23</sup> Deblina reported moderate level of knowledge regarding CoViD – 19 infection among Indian mental healthcare workers.<sup>24</sup>

A study conducted by Yousef K and associates reported that most of Jordan dentists were well aware about CoViD – 19 infection.<sup>25</sup>

As of 22<sup>nd</sup> April 2020, CoViD -19 infection has been confirmed in around 210 countries and territories around the world. There had been approximately 2.6 million cases and around 1,78,000 deaths. According to WHO up till 22<sup>nd</sup> April, 2020 the total number of infected cases reported in USA, Spain, Italy France, China are 8,19,175; 2,04,178; 1,83,957 ; 1,58,050 and 82,788 respectively<sup>7</sup>. Whereas India reported 19,984 CoViD -19 positive cases according to Indian Council Medical Research, India<sup>22</sup>. Hence in the present survey, 65.9% and 32.5% Indian pediatric dentists assumed CoViD – 19 infection as ‘very dangerous’ and ‘moderately dangerous’ infection respectively. 67.2% and 32.2% Indian pediatric dentists

felt that their role in teaching pediatric patients and their parents regarding CoViD -19 infection is ‘very significant’ and ‘moderately significant’ respectively. 56% Indian pediatric dentist felt that they are well prepared for CoViD – 19 outbreak. 98 % pediatric dentists were also satisfied with India government preparation against CoViD -19 infection. Hence it can be concluded that overall most of Indian pediatric dentists had a positive perception against CoViD -19 infection which collaborates with the findings of Pranav M<sup>23</sup>, Deblina<sup>24</sup> and Yousef K<sup>25</sup>.

Relying on authentic sources is a key factor in believing transparent information about the emerging CoViD-19 infection and is essential for pediatric dentist’s preparedness and response. In the present survey 57% of pediatric dentists found social media as a reliable source of information for CoViD -19 infection. Currently, the vast diversity of information available through the Internet, including unverified malicious information, can spread quickly and can misguide community. In particular, health authorities and scientists have warned that widespread misinformation about CoViD-19 is a serious concern causing xenophobia worldwide. In the present survey 29% pediatric dentists preferred government originations as a reliable source of information about CoViD -19. This indicates that the CoViD-19-related updates posted online by official government health authorities had positive implications for improving pediatric dentist’s knowledge levels.

The present survey reports disappointment with respect to attitude of pediatric dentist with respect to CoViD – 19 infection. 38.9% pediatric dentists were not aware about AAPD guidelines for CoViD – 19 infection. Following are AAPD guidelines<sup>26</sup> -

1. Consider whether a dental visit is necessary for any particular child, if your local authorities have not already done so, and manage accordingly.
2. Make a determination for your own approach to seeing urgent and emergent patient needs such as pain, swelling or trauma.
3. Always use universal precautions.
4. Address your environment by removing toys, reading materials and prizes. Thoroughly and frequently clean items that can be cleaned.
5. Clean common areas frequently, including furniture.
6. Try to reduce exposure by having patients wait in their cars until ready to be seen. Text or call them when ready. Ask them to sanitize hands upon entry.
7. Take temperatures of children, exclude patients/parents with symptoms or known contact with CoViD -19 exposed patients, and identify travel history of families. These steps can be taken at home before the family travels to your office.
8. Institute ‘telephone triage’ when families call about dental issues or are reminded of impending appointments to determine if the visit is necessary. Consider selfies for oral conditions as a first level of triage.
9. Limit family members attending visits: minimize hand contact and unnecessary touching.

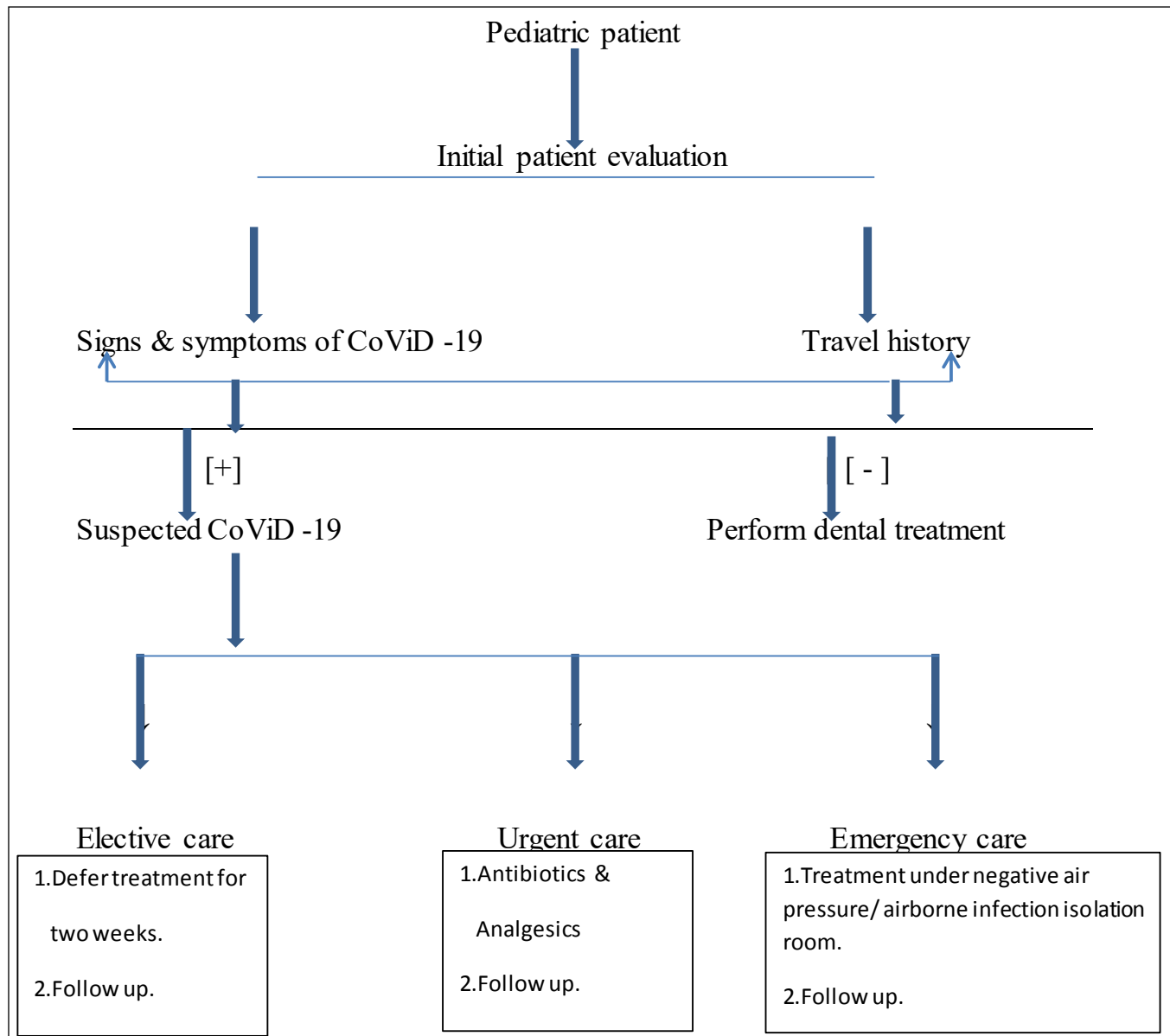


10. Review office policies related to staff members who become ill. Staff with respiratory illness or symptoms should remain home, consider temperature taking before patient care begins.
11. Consider leave time for staff members with a medically compromising condition.
12. Try to minimize aerosol effects using rubber dam and high speed suction, consider oral rinsing prior to treatment, and disinfect surfaces.

56.6% Pediatric dentists have done some training in CoViD -19 infection control, whereas 35.6% were willing to undergo training in future. 57.5% pediatric dentists exhibited confidence 'to great extent' in handling a CoViD -19 pediatric suspect. 10.80% pediatric dentists exhibited no confidence in handling a pediatric CoViD-19 suspect, which was quite disappointing. Hence we present an overview as to how pediatric dentist can manage a CoViD -19 pediatric suspect patient.(Figure 7)

The present survey used WHO training material for assessing awareness, perception and attitude regarding CoViD-19 and infection control to develop a validated questionnaire. The developed questionnaire was pilot tested, and closed-ended questions were limited, to reduce information bias. Despite the findings introduced here, it is important to stress that the present survey had limitations, including the relatively moderate response rate, which resulted in a smaller than expected sample size. This could have been caused by the short period of data collection. Moreover, this pandemic has caused many to be busy with watching the news and taking care of personal affairs. This means that those who were active on social media during the short period of data collection were the only ones that had the chance to participate in the study. This could have resulted in selection bias which prevents the ability to generalize our results. In addition, the data presented in this study are self-reported and partly dependent on the participant's honesty and recall ability; thus, they may be subjected to recall bias.

**Figure 7: An overview of dental management of suspect pediatric CoViD -19 infection.**



## CONCLUSION

Indian pediatric dentists showed adequate level of awareness about CoViD – 19 infection with an overall percentage of 65.67% correct answers. Indian pediatric dentist showed a positive perception regarding CoViD -19 infection. The present survey shows that there is a strong need to implement periodic educational interventions and training programs on infection control practices for CoViD-19 infection. Conducting periodic webinars for educational intervention for pediatric dentists could be a useful and safe tool to further create more awareness and improve the attitude of Indian Pediatric dentists with respect to CoViD -19 infection control.

## REFERENCES

1. Yin Y, Wunderink RG. MERS, SARS and other coronaviruses as causes of pneumonia. *Respirology*; 23(2):130-7. 2018.
2. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, Ren R, Leung KS, Lau EH, Wong JY, Xing X. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *New Engl J Med*. 2020 Jan 29. Doi: 10.1056/NEJMoa2001316.
3. Bhagavathula AS, Shehab A. The story of mysterious pneumonia and the response to deadly novel coronavirus (2019-nCoV): So far!. *Emirates Med J*;1:7-10. 2020.
4. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges. *Int J Antimicrob Agent*.105924. 2020.
5. Eurosurveillance Editorial Team. Note from the editors: World Health Organization declares novel coronavirus (2019-nCoV) sixth public health emergency of international concern. *Euro Surveill*;25(5):200131e. 2020.
6. Coulthard P. Dentistry and coronavirus – A moral decision making. *Br Dent J*;228(7):503-5. 2020.
7. World Health Organization. Infection prevention and control during health care when novel coronavirus ( nCoV) infection is suspected: interim guidance, January 2020. World Health Organization; 2020. Available: [https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-issuspected-20200125](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-issuspected-20200125).
8. Centers for disease control and prevention. Update and interim guidelines on outbreak of 2019 Novel coronavirus (2019-nCoV). Available online: <https://emergency.cdc.gov/han/han00427.asp>
9. World health organization. Responding to COVID-19: Real-time training for the coronavirus disease outbreak. Available online: <https://openwho.org/channels/covid-19>
10. Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *J Med Internet Res*. 2004; 29;6(3):e34.
11. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med* 2020;382:727–33.2020.
12. Gorbalenya AE. Severe acute respiratory syndrome-related coronavirus – the species and its viruses, a statement of the Coronavirus Study Group. *bioRxiv* 2020. <https://doi.org/10.1101/2020.02.07.937862>.
13. Information for healthcare professionals . (2020). Accessed: April 22, 2020: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html>.
14. Kwok YL, Gralton J, McLaws ML. Face touching: a frequent habit that has implications for hand hygiene. *Am J Infect Control* 2015;43:112–4.
15. To KK, Tsang OT, Yip CC, et al. Consistent detection of 2019 novel coronavirus in saliva. *Clin Infect Dis* 2020. <https://doi.org/10.1093/cid/ciaa149>.
16. Zhang J, Wang S, Xue Y. Fecal specimen diagnosis 2019 novel coronavirus-infected pneumonia. *J Med Virol* 2020. <https://doi.org/10.1002/jmv.25742>.
17. Hoffmann M, Kleine-Weber H, Schroeder S, et al. SARS-CoV-2 cell entry depends on ACE2 and TMPRSS2 and is blocked by a clinically proven protease inhibitor. *Cell* 2020. <https://doi.org/10.1016/j.cell.2020.02.052>.
18. Sabino-Silva R, Jardim ACG, Siqueira WL. Coronavirus COVID-19 impacts to dentistry and potential salivary diagnosis. *Clin Oral Investig* 2020. <https://doi.org/10.1007/s00784-020-03248-x>.
19. Giacomelli A, Laura Pezzati L, Conti F, et al. Self-reported olfactory and taste disorders in SARS- CoV-2 patients: a cross-sectional study, *Clinical Infectious Diseases*,ciaa330, <https://doi.org/10.1093/cid/ciaa330>
20. Guan W, Ni Z, Hu Y, et al. Clinical characteristics of 2019 novel coronavirus infection in China. *medRxiv*. Available at: <https://www.medrxiv.org/content/10.1101/2020.02.06.20020974v1>. Accessed March 11, 2020.
21. <https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf>. Site accessed April 22, 2020.
22. <https://diksha.gov.in>. Accessed April 22,2020.
23. Pranav M, Girija N, Abhay U, Janhavi M, Balaji T, Amit S et al. CoViD – 19 awareness among healthcare students and professionals in Mumbai metropolitan region A questionnaire based survey. *Cureus*2020;12(4):e7514
24. Deblina R, Sarvodaya T, SujitaK, Nivedita S,Sudhir K V, Vikas K. Study of knowledge, attitude, anxiety and perceived mental health-care need in Indian population during CoViD – 19 pandemic. *Asian J Psych*;51:102083. 2020.
25. Yousef K, Mohammad N, Barakat AB, Rami S, Mahmoud A, Azzam,Bar A.Dentist’s awareness, perception and attitude regarding CoViD – 19 and infection control: cross sectional study among Jordanian dentist. *JMIR Public health Surveill* 2020;6(2):e18798.
26. <http://www.aapd.org/about/about-aapd/news-room/covid-19/> Accessed: April 22, 2020.