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Does COVID-19 pandemic have any impact on use of behavior management strategies in paediatric dentistry? A cross sectional study

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ABSTRACT

Objective: To analyse the effects of the COVID-19 outbreak on behavior management strategies in paediatric dentistry. *Study Design*: For this cross sectional research, before the COVID-19 pandemic and after the lift of lockdown during COVID-19 pandemic, a standardized close-ended set of 26 questions on behaviour management and paediatric dental practise was developed and forwarded to pedodontist in India. The data of their responses was collected and put into a worksheet in Excel, then analysed statistically and inferences were drawn. *Results:* The preference for non-pharmacological and pharmacological behavior management techniques has been changed; before COVID-19, non-pharmacological behaviour management techniques were widely prevalent but after the lift of lockdown the preference for pharmacological behavior management techniques have noticeably increased. *Conclusion:* Because of the threat of cross-infection in the COVID-19 pandemic, use of strategies for behavior management has been changed. So the paediatric dentist should cope-up with the situations such as the COVID-19 outbreak, adapt to changes in behavior management strategies and become competent enough to effectively perform treatment in paediatric patients.

Keywords: behavior management, COVID-19, paediatric dentist.

1. INTRODUCTION

The novel COVID-19 (coronavirus) pandemic has posed a big challenge to healthcare providers all around the world, which has had a significant impact on dental practise of the practitioners in universities and research institutions. Infectious viral pathogens, like severe acute respiratory syndrome (SARS), could be transferred to healthcare personnel via aerosols from affected individuals (Al-Nerabiah et al., 2020). In dental procedures, there is a substantial danger of cross infection between patients and dentists because a huge number of droplets and aerosols containing microorganisms from an

infected individual could be generate (Peng et al., 2020). Therefore donning of personal protective equipment (PPE) has become mandatory. Hand hygiene, disinfection of equipment and efforts to promote physical distancing is crucially important in COVID-19 pandemic situation.

This pandemic has wreaked havoc on patient management in every medical facility; paediatric dentistry won't be an exception. Dental treatments of children expose them to an environment that can cause natural response of fear and anxiety (Appukuttan, 2016). As the present situation demands the use of PPE, fear and anxiety may be triggered by site of dentist wearing PPE. The PPE worn by paediatric dentist interferes in communications by altering dentist's voice quality and obstructing non-verbal cues. Many changes will be in line to strategize the effective use of techniques for behaviour management techniques. As the literature on behavior management during COVID-19 pandemic is very less, the goal of this research is to find COVID-19 pandemic have any impact on use of strategies for behavior management in paedodontics.

2. METHODOLOGY

We designed this cross sectional research and got it approved by the institutional ethics committee. To analyse the effects of the COVID-19 outbreak on the use of strategies for behavior management in paediatric dentistry in India, a questionnaire was created. This standardized close-ended questionnaire included set of 26 questions on behaviour management and paediatric dental practise before and during the COVID-19 epidemic. The questionnaire was hand out by email or a mobile-based application such as Facebook or WhatsApp, and data was collected. The data was then logged in a worksheet in Excel and descriptive and inferential statistical analysis was settled using chi-square test with SPSS 24.0 version and GraphPad Prism 7.0 version software. $p<0.05$ was considered as level of significance.

3. RESULTS

We conducted this research between June 2020 to December 2020 after release of 1st lockdown during COVID-19 pandemic, for possible changes in behavior management strategies and the changes which may have to be done in the operatory according to participants. In this study, the prepared set of questions handed out to 500 paediatric dentists in India out of which 130 from 18 different states of India responded. Out of the 130 participants, 79.2% were females, and 20.8% were males. Among all participants 70.8% were practicing in dental colleges, 27.7% were private dental clinical practitioners and 3.1% were associated with corporate dental set up. Among these participants, 66.2% had clinical experience between one to five years, 3.8% had experience between five to ten years, and 30% had experience of less than one year.

Among all 130 participants, 95 had started practicing again after lockdown release and were taken into the consideration for this research. These participants were asked about patients attended by them in a day during the pandemic, effect of lack of social interaction on behavior management, pre-appointment communications, attire of practitioners, changes expected in operatory and waiting area, and preferences for different behavior management strategies used in paediatric and preventive dentistry. When asked about their ability for managing paediatric patients, many participants rated 'Good' and 'Average' as their ability for management of paediatric patients aged from new born up to 2 years and the greater percent of participants rated 'Good' for age beyond 3 years for the same. After first lockdown lift in June month of 2020 during the COVID-19 outbreak, number of paediatric patients attended by paediatric dentist had significantly decreased ($p=0.0001$) (Table 1). Around 60% of participants agreed that lack of social interaction due to lockdown will have an adverse effect on child's coping skills in dental operatory.

Table 1 No. of paediatric patients attended in a day before and during COVID-19 pandemic

Paediatric patients attended	**Number of Paediatric patients attended**		**χ2-value**
	Before COVID-19 pandemic	During COVID-19 pandemic	
1 to 3	10(10.53%)	84(88.42%)	**117.5 p=0.0001, S**
4 to 6	67(70.53%)	11(11.58%)	
More than 6	18(18.95%)	0(0%)	
Total	95(100%)	95(100%)	

Test: X^2 test, S: Significant

Table 2 shows that pre-appointment communications during the COVID-19 outbreak have been increased significantly (p=0.0003). The pediatric dentist taking part in this research were questioned that if they allowed parents in the operatory for children above three years of age before and during COVID-19 pandemic and it has been reduced significantly (p=0.0001) (Table 3).

Table 2 Pre-appointment communications before and during COVID-19 pandemic

Pre appointment communications	Before COVID-19 pandemic	During COVID-19 pandemic	χ2-value
Yes	54(56.84%)	77(81.05%)	13.00 p=0.0003, S
No	41(43.16%)	18(18.95%)	
Total	95(100%)	95(100%)	

Test: X^2 test, S: Significant

Table 3 Parents allowed in the operatory for children above 3 years before and during COVID-19 pandemic

Parents allowed in the operatory for children above 3 years	Before COVID-19 pandemic	During COVID-19 pandemic	χ2-value
Never	3(3.16%)	25(26.32%)	**25.62 p=0.0001, S**
Always	37(38.95%)	16(16.84%)	
Sometimes	55(57.89%)	54(56.84%)	
Total	95(100%)	95(100%)	

Test: X^2 test, S: Significant

We observed in this research, 88.4% of participants did some changes in their waiting area in view of the pandemic. Out of 95 participants, 71.6% changed the waiting area to have adequate space and child friendly ambiance without toys and games and 26.3% changed the waiting area to have adequate space and child friendly ambiance with toys and games. Use of colourful/ cartoon print apron by participants have been decreased during the COVID-19 outbreak. Around 63.2% of participants consider PPE as a barrier in communications and non-verbal behavior management in dental operatory and 61.1% consider PPE will have negative impact on a child's behavior in dental operatory. 62.1% agreed and 27.4% strongly agreed on preferring PPE modification with cartoon prints and emojis.

When asked about the preference of strategies for behavior management 48.4% preferred only non-pharmacological and 45.3% preferred both pharmacological and non-pharmacological techniques. In Table 4, among several non-pharmacological behavior management techniques, preference for use of tell show do/ tell play do and modeling was observed to be decreased significantly with p=0.026, p=0.0049 respectively. Other techniques such as audiovisual distraction, reinforcement, controlling voice and somewhat contentious hand over mouth exercise (HOME) has been observed to be decreased; but preference for use of active/ passive restraint has increased (Figure 1). Among different modes of audio-visual distraction techniques 60% participants preferred using television and 41.1% preferred use of mobile games during treatment and 23.2% and 14.7% preferred use of virtual reality (VR) goggles and use of video games respectively. In present study, 60% of participants agreed to use mobile dental game applications in operatory before treatment as desensitization method during the COVID-19 outbreak.

Participants were asked their preference of pharmacological behavior management techniques among oral sedation, nitrous oxide sedation, intramuscular or intravenous sedation and general anaesthesia. In present research we noticed, use of above mentioned pharmacological behavior management techniques decreased during the COVID-19 pandemic (Figure 2). In present study, use of nitrous oxide sedation was observed to be decreased because of aerosols generation, physical contact with patients, and parents' unwillingness.

Table 4 Preference for Tell show do/ Tell play do and modeling before and during COVID-19 pandemic

Preference for non-pharmacological behavior management techniques		May Be	Likely	Unlikely	Very Likely	Very Unlikely	Total	χ2-value
Tell show do/ Tell play do	Before COVID-19 pandemic	1(1.05%)	21(22.11%)	1(1.05%)	72(75.79%)	0(0%)	95(100%)	11 p=0.026, S
	During COVID-19 pandemic	7(7.37%)	32(33.68%)	2(2.11%)	53(55.79%)	1(1.05%)	95(100%)	
Modeling	Before COVID-19 pandemic	11(11.58%)	34(35.79%)	0(0%)	50(52.63%)	0(0%)	95(100%)	14.92 p=0.0049, S
	During COVID-19 pandemic	19(20%)	31(32.63%)	8(8.42%)	35(36.84%)	2(2.11%)	95(100%)	

Test: X^2 test, S: Significant

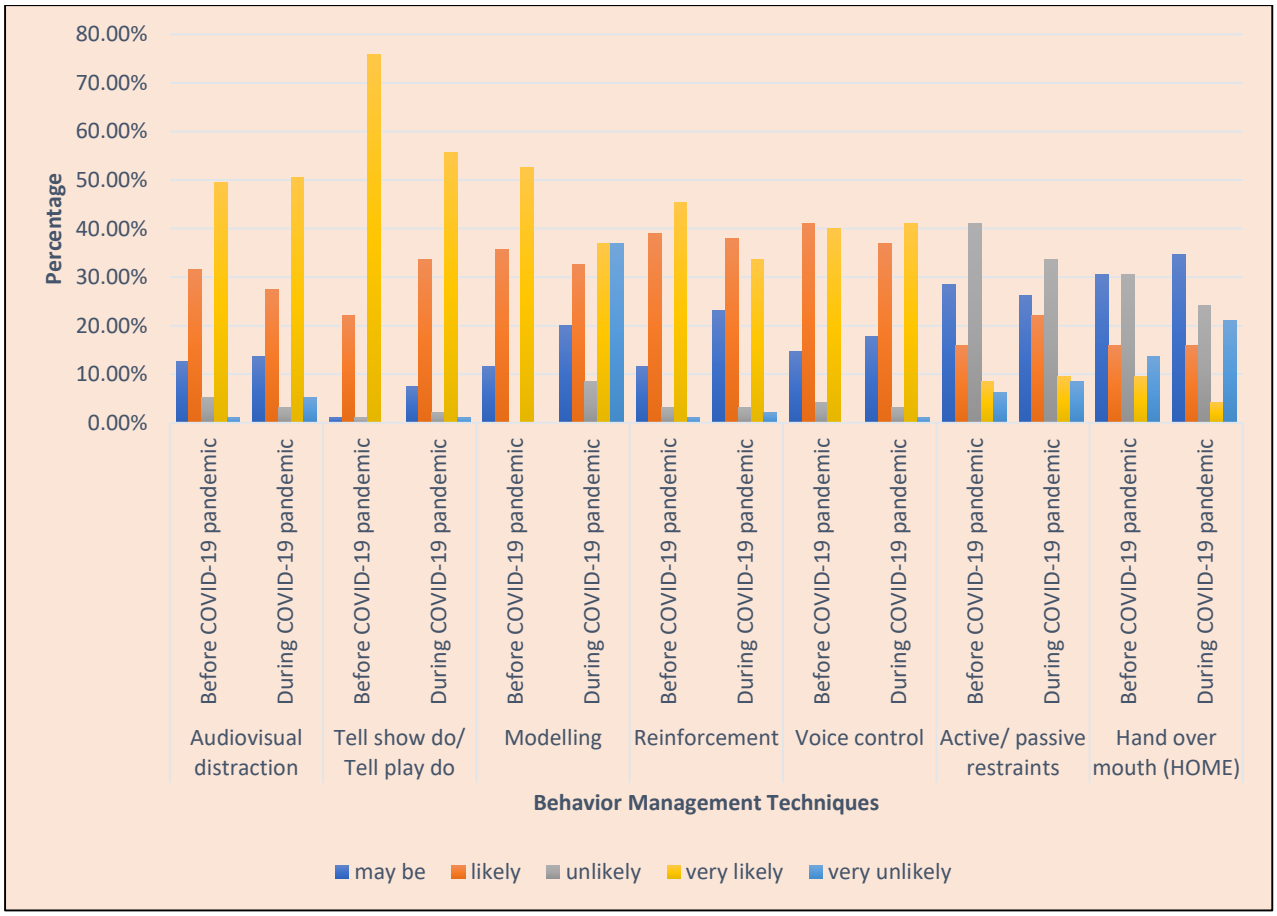

Figure 1 Preference for non-pharmacological behavior management techniques before and during COVID-19 pandemic

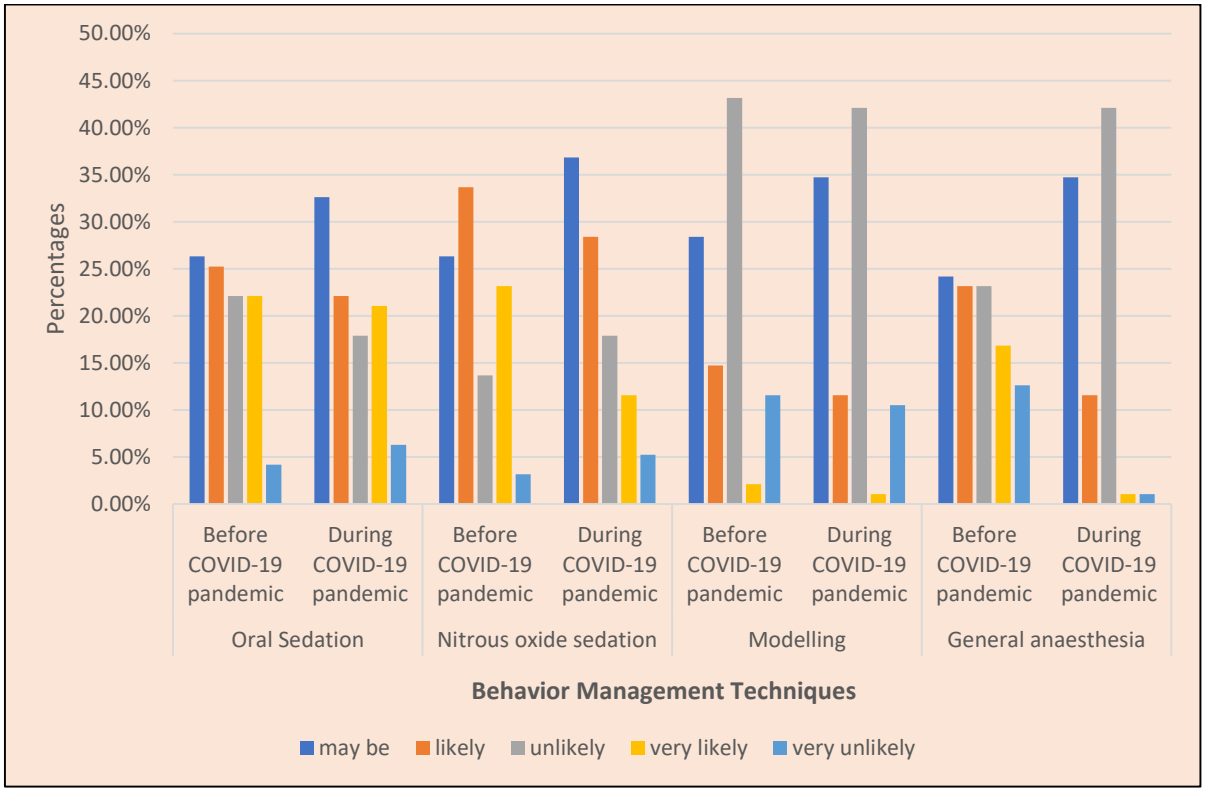

Figure 2 Preference for pharmacological behavior management techniques before and during COVID-19 pandemic

4. DISCUSSION

The possible reason for significant decreased number of paediatric patients attended after lift of lockdown is that as per the nature of the COVID-19 physical/ social distancing is of prime importance (Peng et al., 2020). The relation between behavioural problems and social competency was noticed in an observational study and they discovered that several people who scored low on the behaviour problems scales also had low social competence and skill development (Ramos et al., 2016). Lack of social interaction may have negative impact on social behavior of children.

As guidelines given by governing authority on triaging of care of children with COVID-19, children seeking care at a healthcare facility should be triaged appropriately with assessment of severity of illness (MHFW, GOI, June 2021). For safe dental practice during COVID-19 pandemic, prior teleconsultation will also facilitate to identify patients requiring physical examination in clinic (National Guidelines, MHFW, GOI, 2021). Present study also showed increase in pre-appointment communications during the COVID-19 outbreak to avoid physical interaction in the pandemic. Because of the COVID-19 outbreak, teledentistry along with pre-appointment communications has been utilised more frequently due to social distancing regulations (Wallace et al., 2021). As governing guidelines for safe dental practice during COVID-19 pandemic suggests that all areas to be free of all fomite such as magazines, toys, TV remotes or similar articles (National Guidelines, 2021). We also found in present research, most participants have done changes in waiting area according to guidelines.

In an experimental study it is observed that paediatric patients preferred paediatric dentist in a colourful attire (Babaji et al., 2017). Mandatory PPE use may be the reason for decreased use of colourful/ cartoon print apron in present study. In a cross sectional survey it was noted that, extra PPE operates as a barrier in therapeutic communication with child and children's behavioral management, and it should be adjusted to be more kid friendly (Alsaleh et al., 2020). A pilot study about the dental mobile application concluded that, the app has been found to be quite helpful in a dental set-up for reducing paediatric patients' fear and anxiety (Patil et al., 2017). Tell show do and modeling are the most often utilised behavioural management approaches, (Adair et al., 2007) but it has been observed to be decreased significantly during COVID-19 pandemic. It was expected that use of almost all behavior management techniques will be decreased but however use of active/ passive restraint has been observed to be increased during COVID-19 pandemic.

In our study, reason for less use of only pharmacological behavior management strategies could be the knowledge, training and technique sensitivity of these pharmacological methods. A review suggested transmission of COVID-19 through the inhalation

sedation system, including the tubing, is highly likely. The authors also recommended minimal use of N_2O sedation in inhalational dentistry (Yanko et al., 2020). When treating children in a paediatric dentistry setting, the use of N_2O gas inhalation sedation is considered when weighing the risks and benefits (Namineni & Mallineni, 2020).

5. CONCLUSION

The preference for potential use of strategies for behavior management has been drastically altered due to COVID-19 outbreak. COVID-19 posts challenge to paediatric dentist as a consequence of compulsory use of PPE. Also child's behavior may be affected by attire therefore modification in the PPE with colored/ cartoon print should be adopted. Multiple changes might have to be done in various pharmacological and nonpharmacological behavior management techniques for the better outcome and efficient behavior management. However, use of nitrous sedation during COVID-19 pandemic should be considered safe if extreme caution taken care, PPE used and standard safe working practices followed. Therefore it is up to paediatric dentist to cope up with the situations like the COVID-19 outbreak and make oneself a suitable individual to make use of strategies for behavior management for better treatment results of paediatric patients.

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Author's contribution

[1]Study concept, designed research, carried out study, analysis, acquisition and interpretation of data, wrote the manuscript

[2]Designed research, analysis and interpretation of data, wrote the manuscript, critical revision of the manuscript

[3]Analysis and interpretation of data, critical revision of the manuscript

[4]Study supervision, critical revision of the manuscript

Ethical approval

The study was approved by the Institutional Ethics Committee of VSPM's Dental College and Research Centre, Nagpur. (Ethical approval code: ECR/885/Inst/MH/2017). Ethical approval number: IEC/VSPMDCRC/24/2020.

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Conflict of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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