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ORIGINAL ARTICLE

COVID-19 and Personal Protective Equipment-Related Challenges Faced by Pediatric Dentists during patient care: A Qualitative Study

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ABSTRACT

Objective: To describe the challenges pediatric dentists face while caring for their patients during the pandemic. **Material and Methods:** A descriptive qualitative study was conducted with purposefully sampled pediatric dentists. Data were collected through in-depth, semi-structured interviews until the content of the collected data reached theoretical saturation. Data were transcribed verbatim, coded, and analyzed using content analyses. **Results:** Seven participants (four females and three males) between 29 and 50 years participated in the study. Three themes emerged from the analyses: Anxiety and fear; PPE (Personal Protective Equipment) and its impact on care delivery; and 3) Behavior management. **Conclusion:** Dental care delivery was challenging for pediatric dentists. They experienced high anxiety levels and modified their services according to the recommended guidelines while making accommodations to lessen patients' COVID-19-related anxiety. The additional mandated PPE use affected the communication between the dentists and their patients, affecting their dentist-patient bonding.

Keywords: Pediatric Dentistry; Personal Protective Equipment; Psychology; COVID-19; Anxiety.

Introduction

Since the origin of the COVID-19 pandemic, there have been many changes to how we live, work, and socialize. Despite the vaccines, emerging variants continued bringing uncertainty at all levels [1]. The risk of COVID-19 infection remained very high among healthcare workers, especially those who provide direct care to patients, including dentists [2]. Dentists are exposed to blood and saliva directly or through contaminated instruments and the aerosol generated through various dental procedures [3]. Thus, dental care providers experienced fear and heightened anxiety toward COVID-19, affecting how dentists live their lives and deliver care to their patients [4].

Additionally, the additional PPE affected the dentists' well-being negatively. For instance, prolonged PPE use seemed to cause skin irritation, itching, and rashes, affecting the care provision [5]. The PPE-related headaches and exacerbation of their pre-existing headache disorders have also been reported by healthcare workers [6].

Compared to general dentistry, pediatric dentistry is more complex as it involves providing dental care to children who are afraid and have oral pain. Also, children exhibit various attitudes and temperaments in dental offices that interfere with care delivery. Some children do not cooperate, requiring complex behavioral management techniques. Pediatric dentists must be more patient and flexible to accommodate fearful and challenging patients and comprehensively provide care [7]. However, the new pandemic-related mandates and the new norms have significantly altered patient management and care delivery [8]. Studies have reported that colorful/formal attires worn by pediatric dentists are more appealing to children patients and lessen their anxiety [9-11]. However, the mandated PPE causes a significant barrier to creating such child-friendly dental office environments. Furthermore, the use of face shields and modified face masks significantly affects verbal and non-verbal dentist-patient communication before and during dental procedures [12].

Currently, very little is known about what challenges pediatric dentists face while providing care to their patients amid the pandemic and how they overcome those challenges. This paper describes the experiences of pediatric dentists in providing care to their patients amid the COVID-19 pandemic and subsequent challenges.

Material and Methods

Ethical Clearance

This descriptive qualitative (DQ) study was conducted following ethics approval by the Ethics Committee (Ref. No: 20083).

Participants

The study participants were pediatric dentists registered with the Indian Dental Association, practicing in Dakshina Kannada (a southern region of India) during the study period using the Mandated PPE. Participants were identified and recruited using the purposive sampling method by two designated research team members. Those who agreed to participate were recruited, and informed consent was obtained before participating in the study.

Data were collected through in-depth, semi-structured interviews with the participants using an interview guide created for the study. All interviews were conducted by the lead investigator remotely on a virtual platform using Microsoft Teams. All interviews were audiotaped, and field notes were taken. At the end of each interview, the contents of the discussions were summarized to confirm the accuracy of the collected information. Any discrepancies in what the participants said and what we understood were clarified at the end of

each session. The data collection continued until "data saturation" was achieved [13]. The anonymity of the study participants was established by assigning a unique participant code to each participant at recruitment.

Data Analyses

The audio recordings and field notes were transcribed verbatim after each interview. Two investigators (KYM and RS) read and reread the transcripts and coded independently using the line-by-line coding method. Codes were then merged into categories and subcategories, and themes were identified. The consolidated criteria for reporting qualitative research (COREQ) checklist was used to ascertain quality in the reporting of this study [14].

Results

Seven pediatric dentists (four females and three males) between 29 and 50 years of age participated in the study. The interviews were 24–38 minutes long. The study participants revealed that they treated an average of only three patients per day during the pandemic, while they were treating an average of 6 patients per day before the onset of the pandemic. Interestingly, the average duration of the practice pre-pandemic and during the pandemic remained almost the same (3.3 hours/day and 3 hours/day, respectively). In the iterative data analyses, the following themes emerged: 1) Anxiety and fear, 2) PPE and its impact on care delivery, and 3) Behavioural management during the pandemic. Each is described below and in Table 1 using the participants' voices.

Anxiety and Fear

Anxiety and fear towards COVID-19 was a common occurrence in our study. It affected the participants, their patients, and the patient's parents. However, the reasoning and consequences for the fear and anxiety and action plans varied widely between them.

Parents' Fear and Anxiety

Overall, anxiety and fear caused a significant change in parents' dental care-seeking behavior for their children during the pandemic. The participants expressed that the parents were highly anxious and thus reduced the frequency of their children's dental visits and sought dental care only if required (Quote 1). Required meant the child having a toothache or swelling due to teeth. The participants blamed social media for posting misinformation about the dental office environment and instilling fear in people's minds toward dental offices. For example, even though aerosol production is inevitable in many dental and medical procedures, people see aerosol generation only in dental settings (Quote 2). This heightened anxiety in people, resulting in avoiding the most needed dental procedures. The parents feared that their children may get infected by others who visited the dental office during or before their visits. Thus, most postponed the prophylactic dental procedures and did not follow the regular follow-up schedules (Quote 3). Seeing the heightened anxiety in patients (Quote 4), A few participants went beyond their standard protocol to accommodate parents and complete necessary dental procedures to avoid severe consequences (Quote 5). With time, though the COVID-19 fear continued, the parent's understanding of the disease and its spread lessened. Slowly but steadily, seeking routine dental care for children started resuming. At that point, the parents discussed their concerns about disease transmission in dental offices. The parents expressed keen interest in learning about the infection control procedures followed

in the dental offices. Also, they read the information posted on the dental office websites and in the waiting rooms.

Providers' Anxiety

Early during the pandemic, the participants were uncomfortable providing dental care to their patients because they feared contracting COVID-19 and transmitting it to other patients and their family members. They attended only to patients' emergencies/urgent care needs, which often included relieving dental pain. As time progressed, all participants returned to the routine, although they significantly changed how they provided dental care. Most avoided aerosol-generating procedures and performed alternative treatment procedures when possible (Quote 6). Also, they followed pre-appointment COVID-19 screening a day before the patient's dental visit to the office. They reduced their working hours, saw fewer patients/day, attended to patients only by appointment, and followed the appointment times strictly to perform the dental procedures. When possible, they clubbed procedures to reduce patients' number of dental visits (Quote 7).

Changes in the Infection Control Practices

All participants understood the significance of infection control for providing safe dental care and changed their infection control protocols. For example, children often run around touching surfaces in pediatric dental offices. Therefore, they had to pay special attention to such surfaces while sanitizing the dental office between appointments (Quote 8). As a result, they took longer breaks between the patients in addition to the fallow time. Also, a few instructed their patients by phone on what attire to wear for their dental appointments (Quote 9). Most participants allowed the parents inside the operatory if they wore a mask and respected the infection control protocols of the dental office. All participants reported wearing the required PPE and mandated that their staff wear them depending on their role and vicinity to the operatory. Some did not allow a dental assistant in the operatory to lessen the number of required people (Quote 10).

PPE and its Impact on Care Delivery

Though added, PPE is essential and a new norm for delivering safe dental care during COVID-19, the care delivery and communication between dentists and patients suffered.

Impact on Patient

Two participants felt that their patients (children) were used to various types of PPE because of television or social media. Others were afraid to see a dentist wearing the whole PPE attire as it reminded them of the hospitals and thus, did not want to come closer to the dentist (Quote 11). The patients were more anxious at the first appointment. However, their anxiety levels declined with the subsequent follow-up appointments. The patients liked colorful masks, especially those with cartoon prints. Most parents were happy and satisfied with the dental personnel using the necessary PPE and following strict infection control protocols. They had no problem accepting the added treatment costs accounting for the PPE. A few parents found it difficult to connect with the dentist due to the added PPE, which obscured the dentist's face even before procedures (Quote 12).

Impact on Dentists

The participants were uncomfortable working with the added PPE (footwear, head cap, face shield, and gown) because the PPE affected their care delivery by affecting their visibility due to the eyewear and face shield

fogging. Overall, they felt the additional use of PPE slowed their work and decreased their comfort level in delivering care. They felt tired, suffocated, dehydrated, sweaty, skin irritated and experienced frequent headaches and dizziness. Furthermore, they could not eat, drink, or use the washroom as needed (Quote 13). Despite that, most participants got accustomed to wearing the additional PPE and felt that choosing an appropriate PPE is crucial and may lessen most of their PPE-related challenges.

Behavior Management during the Pandemic

The risk of infection spread and added PPE significantly affected patient (child) management in dental offices. Immediately following the reopening of the lockdown, most participants were hesitant to provide dental care to uncooperative patients. They managed most of the urgent care situations by prescribing painkillers and antibiotics. As time progressed, they started performing emergency dental procedures, placing less emphasis on patient management procedures (Quote 14). The frequently used patient management techniques were protective stabilization or voice control for quickly completing emergency dental procedures. A few were skeptical about such a practice as they felt that if the patients cried, it might ultimately generate unwanted aerosols (Quote 15). A couple of dentists who practiced sedation in their clinics before the pandemic said they would continue to use moderate sedation when indicated.

The frequently observed challenge was the inability to connect with their patients because of the facial expressions and the body language hidden behind the added PPE (Quote 16, 17). Also, the face shield hindered their ability to maintain eye contact. Their verbal communication was also greatly affected, and they had to speak louder and repeat instructions multiple times because the PPE hindered their patients' ability to hear (Quote 18). When spoken in loud voices, some children did not take it positively. Gestures such as a gentle tap on the back to build rapport with the patient were impossible due to the heightened risk of COVID-19 spread. Thus, the main focus was on getting the job done (the dental procedures). Four participants communicated with their patients before donning the PPE to establish a connection (Quote 19). A few allowed one parent inside the operatory for those children who needed parental presence, provided that they wore the essential PPE specified by the dental office and requested to remain silent during the dental procedures (Quote 20, 21).

Table 1. The participants' responses.

Quote	Responses
Quote 1	"Many patients came with the Abscess, and when asked, why did you delay so long? The first thing they say is we wanted to push it as much as possible because of Covid; we didn't want to come to a dental clinic where a lot of patients walk in and get affected by Corona."
Quote 2	"I think the media has played a big role here. They had demonized dentistry to a large extent for Covid transmission, whereas in reality, a lot of other medical professions also involved aerosol generation. Media to a large extent and, to some extent, dentists themselves. They have put up articles on social media, which have created a wrong perception."
Quote 3	"Usually, we have a Monthly review for patients with my brace to train them about the exercises so that they don't forget. The patient who used to come regularly for review did not report because of the fear of Covid infection."
Quote 4	"Yeah, I have come across one patient's parent who made the child wear the mask even in between the treatment. While putting the instrument inside the mouth, they remove the mask, and when I take the hands out to get some other instrument, the parent puts the child's mask on. They don't want to leave the child anytime without a mask. Only when I'm treating the mask is down. The moment I turn to take the next instrument, the mask is on."
Quote 5	"For Some new patients/parents, what we did to ease their worry is we made them get their items: towel, mask, gloves. Because we allowed them to spread their bedsheets on chairs to use their things, they felt clean and safe. This way, parents were more comfortable."

Quote 6	"I preferred to do more extractions, preventive procedures, atraumatic restorative treatments (ART), use of silver diamine fluoride treatments (SDF), or a simple temporary restoration to prevent food impaction."
Quote 7	"I try to reduce the clinic time for the patient and also the number of appointments."
Quote 8	"We had to clean everything including the doorknob, the chairs where they sat, and the other areas, which they were touching, inside and outside the dental operatory… everything has to be cleaned."
Quote 9	"Instructions were given on the phone to patients to wear full-sleeve shirts, long pants, and socks to ensure complete coverage."
Quote 10	"Into the surgical room, only I and the child would go. I preferred not to have a chairside assistant."
Quote 11	"Some children are really scared to come close. They relate us to the hospital setup."
Quote 12	"Sometimes, the parents have told me that since they are not able to see my face (especially the ones coming for the first time), they are not able to make connections with the doctor. This is because the doctor has PPE all the time, and most of the time, only eyes are visible."
Quote 13	"Another problem was being unable to drink water, eat anything, and not going to the washroom in between while wearing PPE. Duty was almost for 6-8 hrs. I was not able to breathe casually, and that had an impact."
Quote 14	"I usually take two appointments to convince them, explain them, and talk to them in an attempt to gain cooperation for the treatment. But these days, we just make one appointment. If they don't cooperate, then we just suggest pharmacological behavior management. We don't want to spend a lot of time training children to cooperate."
Quote 15	"I didn't want to trigger the child for a crying episode. I was scared if they cried or became uncooperative, there would be too much aerosol."
Quote 16	"I have seen most of them just looking at me, expressionless, just gazing at me with no expressions."
Quote 17	"The child may be okay seeing us with a mask, but then for the child to get attached to us, they need to see our face and smile. That was not happening."
Quote 18	"Generally, when pediatric dentists speak, they speak more expressively, like they show more facial expressions, and I feel when you try talking to the patient with a lot of expressions, they also get along with you better. Now, it's not happening. So, the only thing is you have to try connecting to children using hand movements and voice. But, when we wear masks, our voice also is not heard properly by the patient. So, you will have to speak loudly and repeatedly, spending more energy on that."
Quote 19	"Explanation to the child on what will be done is given before donning the PPE. This way, the child gets familiarized with me better, and also my chair-side time is less while discussion table time is more."
Quote 20	"When we work on chairs, parents won't wear masks properly. While working, suddenly, we realize that parents are not wearing the mask. The mask will be down on the neck or near the chin."
Quote 21	"These days, we ask only one of the parents to come inside the operatory. I want the communication with the parent to be as minimal as possible during the procedure. So, I completed the communication part before starting the procedure and instructed the parent to be a silent observer in the operatory."

Discussion

This qualitative study was conducted with pediatric dentists to explore and understand how they continued to provide service during the COVID-19 pandemic and what challenges they faced in managing the patients with the additional mandated PPE use. We observed that both participants and their patient's parents had heightened anxiety as the pandemic began, which was declining with time. The participants pre-screened their patients for COVID-19 symptoms/exposure, changed the care delivery methods, changed their infection control protocols, and followed the recommended PPE. However, they were concerned that the PPE impaired their communication with the patients.

As reported in the past, we observed that the number of dental visits reduced during the pandemic, and fewer dental procedures were performed, focusing on meeting the patients' urgent care needs [15-17]. Also, participants reported modifying their practice protocols to decrease cross-contamination and prevent cross-infection. Our participants started maintaining strict appointment schedules, taking longer breaks between patients to accommodate fallow time and infection control, and performing check-in procedures before the scheduled appointments to maintain safe care delivery and prevent cross-infection, as reported earlier [15-18]. The present study included only pediatric dentists who wore PPE. The participants faced many similar PPE-related child behavior management challenges, as reported by Alsaleh et al. [8], including those in establishing communication between the patients and building a rapport.

One of the interesting findings of our study is that a few of our study participants allowed extremely anxious parents of the patients to get their towels, masks, gloves, etc. Although this may comfort patients, it can be criticized because it is not aligned with the dental care delivery protocol. However, if it was not allowed, the patients may not have received the most needed care, resulting in more severe consequences. Though it may not be appropriate for some jurisdictions, this is not looked down on in India as the participants made the informed decision to manage the situation. Interestingly, the parents became keen on the infection control procedures in the dental office where they sought care for their children, and such observation is not isolated to our study alone [19]. Sun et al. [17] reported that parents have more confidence when they trust the infection control protocols of the dental operatory. Our study participants conveyed the infection control protocols of the clinic through posters displayed in the waiting area to inform their patients. Another interesting finding of our study was that the parents were happy to see the dental personnel following the appropriate PPE mandate as recommended and were not concerned about establishing a connection with the dentist.

Some of the patients experienced high anxiety levels due to the additional PPE, which was not the case before the pandemic. It is possible that they were not expecting the dentists in new attire to cause this anxiety, as reported in other studies [20,21]. Secondly, participants did not focus on communicating with the patients, which interfered with building a patient-doctor relationship. It was clear that the patients got used to the new norms of the dental offices, and their fear declined in subsequent dental visits. The other possible explanations include that the pandemic may have negatively impacted the child's emotional state due to isolation and disruption of routine and social life [22]. Also, the parents brought their children for dental care during the pandemic only for urgent care needs, such as pain and swelling due to tooth problems [20,23,24]. This also may have escalated their anxiety, as observed earlier [2]. Most of the participants in the present study spoke about using colorful masks with cartoon prints to make them children-friendly. However, such masks were non-medical masks and could not be used during the pandemic for providing dental care. The N95 masks offer the highest degree of protection than the other categories of masks, though they may not be child-friendly [25].

The results of the present study recommend that pediatric dentists modify their patient management skills, especially during the cases of a pandemic like COVID-19, by adapting to new evidence-based ideas. Pre-appointment communication/teledentistry helps prepare the patient to receive dental treatment and makes parents aware of the infection control guidelines followed in the clinic [20,26]. The post-operative instructions can also be mailed to the parent [20]. Videos can be sent that take the child patient on a tour of the dental office, familiarizing the dental office and the dental team [20,21]. It helps the child to know that the pediatric dental office looks different from the usual without toys, which are difficult to sanitize [27]. Rewarding children with digital certificates is a part of positive reinforcement. Children can be made aware of the PPE beforehand by the parents. Children can also be made to know the appearance of the dentist without the PPE through a telephonic video consultation before the appointment [20].

While interpreting the results of the present study, the following limitations should be considered. Firstly, the present study was conducted using purposive sampling and thus does not represent all pediatric dentists. Secondly, the study was conducted after the second wave of COVID-19 had settled and people were getting vaccinated, especially healthcare professionals, including dentists. With that, many people in India believed they had conquered the pandemic. Thirdly, some participants may have hidden their experiences or modified their responses to maintain the image of not being judged. We took care of this by assuring the participants and encouraging them to tell their experiences to learn lessons from them during the critical time

the world was facing. Nonetheless, our study provides in-depth experiences of pediatric dentists that are relatable to many dentists who provide care to children.

Conclusion

Dental care delivery was challenging for pediatric dentists. They experienced high anxiety levels and modified their services according to the recommended guidelines. The additional mandated PPE use affected the communication between the dentists and their patients, affecting their dentist-patient bonding. The COVID-19 pandemic global experience has been a teaching tool for most and may help maintain adequate infection control while providing safe dental care to children.

Authors' Contributions

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All authors declare that they contributed to a critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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