

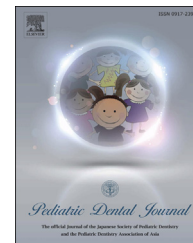


Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Available online at www.sciencedirect.com

Pediatric Dental Journal

journal homepage: www.elsevier.com/locate/pdj

Review

The clinical practice of Pediatric Dentistry post-COVID-19: The current evidences



Sávio Carvalho Sales ^a, Sandra Meyfarth ^b, Angela Scarparo ^{a,c,*}

^a Dental School of Health Institute of Nova Friburgo, Fluminense Federal University (UFF), Rua Dr. Silvio Henrique Braune, 22 - Centro - Nova Friburgo - RJ, CEP - 28625-650, Brazil

^b Postgraduate Program in Dentistry, Fluminense Federal University, Niterói, R. Mario Santos Braga, 28 - Centro, Niterói - RJ, CEP - 24020-140, Brazil

^c Postgraduate Program in Dentistry of Health Institute of Nova Friburgo (PPGO-ISNF), Fluminense Federal University (UFF), Rua Dr. Silvio Henrique Braune, 22 - Centro - Nova Friburgo - RJ, CEP - 28625-650, Brazil

ARTICLE INFO

Article history:

Received 30 September 2020

Received in revised form

6 January 2021

Accepted 12 January 2021

Available online 26 January 2021

Keywords:

Pediatric dentistry

Dentistry

SARS-CoV-2 virus

Containment of biohazards

Behavior

Evidence-based dentistry

ABSTRACT

The Severe Acute Respiratory Syndrome (SARS) caused by SARS-CoV-2 virus has quickly spread all over the world, directly affecting the dentistry practice. This study aimed to perform a literature review about the current evidences on biosafety practices and clinical recommendations regarding the return to the elective dental care in the practice of Pediatric dentistry. An electronic search was performed in PubMed, Scopus, Web of Science and Grey literature databases using the terms “Pediatric dentistry” and “COVID-19”. Initially, 38 studies were retrieved. After title and abstract were read, it was identified that 22 studies referred specifically to children's dental practice. A total of 19 studies were included in this study. The COVID-19 pandemic will imply significant changes in the reorientation of dental practices, from biosafety issues to technical procedures. Greater rigor in the use of Personal Protective Equipment (PPE) may cause strangeness for children. Consequently, an improvement in the management of patient's behavior before and during the treatment and new approaches to perform the procedures will be demanded. Non-aerosol techniques and minimally invasive procedures will be preferable whenever possible. Professionals will need to be constantly updated based on what the scientific literature recommends. The moment is suitable for the use of preventive practice and minimally invasive techniques. © 2021 Japanese Society of Pediatric Dentistry. Published by Elsevier Ltd. All rights reserved.

1. Introduction

The first semester of 2020 was marked by the quick spread of the new coronavirus all over the world. This virus causes the Severe Acute Respiratory Syndrome 2 (SARS-CoV-2). The

SARS-CoV-2 transmission among humans has been characterized by air droplets or direct contact with contaminated objects and surfaces [1–6]. Although the whole world is working to stop the viral spread, the outbreak has not stopped yet [4]. The number of deaths is still a distressful

* Corresponding author. Rua Dr. Silvio Henrique Braune, 22 - Centro Nova Friburgo - RJ - CEP - 28625-650, Brazil.

E-mail addresses: saviosales@id.uff.br (S.C. Sales), srsmeyfarth@gmail.com (S. Meyfarth), angelascarparo@id.uff.br (A. Scarparo).
<https://doi.org/10.1016/j.pdj.2021.01.002>

0917-2394/© 2021 Japanese Society of Pediatric Dentistry. Published by Elsevier Ltd. All rights reserved.

reality. Given the widespread transmission of the novel coronavirus, healthcare professionals are at a high risk of contracting the infection and becoming potential carriers of the disease [6–8].

The disease that the virus causes is called COVID 19. The impact of this infection on dentistry practice has been too strong [9]. Dentistry is placed at a very high exposure risk category, due to the possibility of exposure to biological infectious materials disseminated as droplets and aerosols and the high viral load present in the upper airways and saliva [6,9–12], as well as the close proximity to the patient's oral cavity [6,7]. This situation becomes even worse when treating children and adolescents. Recent studies have shown that most of children remain asymptomatic despite having contracted the disease and may contribute significantly to transmission [1,13].

Given the aforementioned information, this study aimed to perform a literature review of the available evidence about the Pediatric dental practice related to biosafety and clinical recommendations in order to guide Pediatric dentists regarding dental approaches post-COVID-19 still without the vaccine.

2. Literature review

An electronic search was performed in PubMed, Scopus and Web of Science databases until September 21st 2020. The search strategy involved a combination of controlled vocabulary (MeSH) and free terms, as shown in Table 1. No filters or limits were applied. There were no date or language restrictions. Articles in more than one data base were considered just once. Additionally, grey literature was also consulted via Open Grey database. A manual search was also performed by reading the reference list of the selected articles to identify any other eligible studies.

Table 1 – Search strategy.

Pub Med	#1 ((pediatric dentistry [MeSH Terms]) OR (pediatric dentistry [Title/Abstract])) OR (pediatric dentistry [Title/Abstract]) #2 ((SARS-CoV-2 [Title/Abstract]) OR (coronavirus [Title/Abstract])) OR (COVID-19 [Title/Abstract]) #1#2 (((pediatric dentistry [MeSH Terms]) OR (pediatric dentistry [Title/Abstract])) OR (pediatric dentistry [Title/Abstract])) AND (((SARS-CoV-2 [Title/Abstract]) OR (coronavirus [Title/Abstract])) OR (COVID-19 [Title/Abstract]))
WoS	# 1 TOPIC: (pediatric dentistry) # 2 TOPIC: (COVID-19) OR TOPIC: (coronavirus) #2 AND #1
Scopus	TITLE-ABS-KEY (pediatric AND dentistry) (TITLE-ABS-KEY (covid-19) OR TITLE-ABS-KEY (coronavirus)) (TITLE-ABS-KEY (pediatric AND dentistry)) AND ((TITLE-ABS-KEY (covid-19) OR TITLE-ABS-KEY (coronavirus)))

The inclusion criteria were articles that assessed Pediatric dentistry dental practice and COVID-19.

2.1. Studies selection

The electronic search was performed in the databases by two independent reviewers (SM and AS). Initially, 38 articles were retrieved. After reading title and abstract, 22 studies were selected. The inclusion criteria were applied and 19 articles were included in this study. Fig. 1 shows the flow diagram of the literature search.

The selected articles had their text read in full and the following data were extracted: author, date, type of paper and content/considerations. Table 2 shows the characteristics of the included studies.

For better understanding, the literature review was divided into four topics, as follows: 1. Protocols or clinical pathways; 2. Aspects related to biosafety; 3. Clinical practice – dental procedures and 4. Child behavior management.

2.2.1. Protocols or clinical pathways

To avoid the risk of virus transmission, the American Dental Association has developed guidance to categorize emergency, urgent and non-urgent or routine dental procedures. Dental conditions that can be potentially life-threatening and require immediate treatment are considered emergencies, such as hemorrhage, dental trauma and cellulitis that compromise a patient's airway. Non-life-threatening dental problems presenting pain or localized cellulitis are considered urgent [12].

Although some countries have been limiting dental care to emergency procedures only, using teledentistry as alternative to in office care, caregivers must inform in advance, during the virtual consultation, if the child has been unwell and feverish for the last 24 h and should be informed about the use of a face mask on the day of the appointment [5,14,15].

Fig. 2 illustrates scheme considering the practice of Pediatric Dentistry post-COVID, i.e, indicating the procedures in the phases with their marking.

2.2.2. Aspects related to biosafety

With a gradual and programmed return to activities, dentists and their professional team will need to have an extra care regarding the suitable use of the Personal Protective Equipment (PPE) to minimize the risk of contamination and cross-infection during dental care [5,11,13]. They will also need to update their knowledge and skills regarding infection control and follow the protocols [7,14]. Considering the virus incubation period, the asymptomatic course of the disease observed in children, or even mild and unspecific symptoms, all patients and caregivers must be considered potential carriers of COVID-19 [1].

Administrative, educational and preventive training measures should be used to avoid the infection [1]. The intervals between the appointments should be longer and patients and dentist should respect the scheduled time. A longer interval is important to carry out all recommendations for disinfection of the dental office and to avoid agglomeration of patients in the waiting room. Patients and caregivers should be wearing facial masks [6]. Sink with soap and water for hand washing

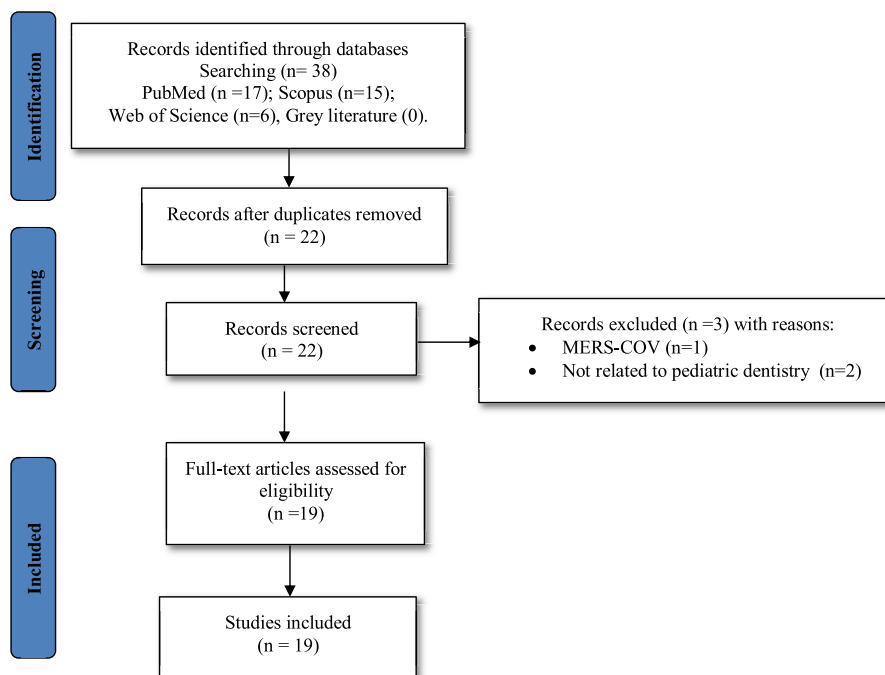


Fig. 1 – Flow diagram of literature search.

and hand sanitizer (70% alcohol gel) should be easily available. Handwashing, the use of PPE, sterilization of instruments, proper waste disposal and safe anesthesia practices must be accomplished [1].

In cases of known or suspected COVID-19 positive patients, the use of N95 or a higher-level respirator, eye protection, face shield, gloves, and a gown are recommended to carry out aerosol generating procedures (AGP) [12]. Due to the high transmissibility and permanence of the virus in the

environment, the last hours of appointments should be reserved for children infected by COVID-19 [6,13]. For non-AGP dental procedures on a healthy patient, a combination of appropriate surgical mask, face shield, gloves, and a gown are recommended [12]. Elective treatments should be avoided whenever possible, prioritizing urgent procedures. Visual alerts, such as signs and posters, at the main entrance and in the waiting room should be placed to reinforce biosafety measures [5].

Table 2 – Characteristics of the included studies (n = 19), in alphabetical order.

Author	Date	Type of paper	Content/Considerations
Acharya et al. [27]	Sep	Interdisciplinary update	<ul style="list-style-type: none"> - Proper screening of all patients - Identifying the urgency of the treatment needed - Urgent cases performed with proper care of the child and parent including airborne precautions with PPEs for every case; prepare the child mentally before the visit as the clinic environment has changed in these times, with pediatric dentists and assistants behind their PPEs which may scare the child.
Achmad et al. [29]	Jun 18th	Literature review	<ul style="list-style-type: none"> - Patient tele-screening - Personal protective equipment (PPE) for pediatric dentists and other health professionals - Triage: urgent care and emergency cases should become standard practice in the current pandemic; check the child's body temperature and ask for a history of travel - Children must be accompanied by a minimum number of people and wearing masks. - Patient asked to gargle with 0.5%–1% hydrogen peroxide for 1 min or Povidon iodine mouthwash (1%) for 15 s 1 min - Use of rubber dam, parents outside the operating room “social” digital platform where pediatric dentists can publish and disseminate behavioral guidelines to protect children's oral health - Guide and monitor the families regarding the child eating habits

(continued on next page)

Table 2 – (continued)

Author	Date	Type of paper	Content/Considerations
Al-Halabi et al. [13]	Jun 16th	Critical review Clinical recommendations	<ul style="list-style-type: none"> - Triage cases into advice only, urgent care and emergency cases should become standard practice in the current pandemic - Avoidance of elective AGPs is recommended wherever possible and management of emergencies should take priority - Rethink the practice of pediatric dentistry utilizing more prevention-centered practices and/or non-traumatic or minimally invasive techniques in caries management
Amorim et al. [5]	Jun 22nd	Critical review	<ul style="list-style-type: none"> - Reconsider the clinical practice, especially regarding behavioral changes aiming operational biosafety - Rethink strategic alternatives and specific preventive improvements to be planned and executed that has emerged during the COVID-19 pandemic - Search for new information constantly and continuously to give the pediatric patient humanized and effective treatment
Bahramian, Gharib, Baghalan [18]	Jul 14th	Review	<ul style="list-style-type: none"> - Use preventive techniques as much as possible, using fluoride varnish (at home) - Consider the patient's treatment necessity according to caries risk assessment - Keep in contact (Phone call, video chat, social media [Instagram], educational videos)
BaniHani et al. [19]	Jul 28th	Perspective	<ul style="list-style-type: none"> - More minimally intervention techniques in caries management will need to be utilized in order to minimize the risk of spreading the infection. Pediatric Dentistry Practice has several techniques for dealing with carious lesions; try to apply all oral health preventive and therapeutic measures during this time to control the disease.
Bhardwaj et al. [28]	Jun 30th	Review	<ul style="list-style-type: none"> - Online or via phone dental screening: to evaluate emergency conditions (acute pain, swelling, trauma). - Personal protective equipment (PPE), N95 masks, disposable head cap and foot covers: dentists and assistants - Patients should be checked for clinical signs and symptoms of any respiratory problem.
Cagetti & Angelino [24]	May 20th	Short communication	<ul style="list-style-type: none"> - Non-invasive treatments, such as: fluoride and varnishes, sealants, resin infiltration, Hall technique, ART (atraumatic restorative treatment) to reduce generation of aerosol and chair time.
Casamassimo, Townsend, Litch [20]	Mar 15th	Guest editorial	<ul style="list-style-type: none"> - A hybrid value-based care system that combines health maintenance and case management, prevent the challenges we face by reducing the need for emergency and advanced care.
Cianetti et al. [21]	May 26th	Narrative overview	<ul style="list-style-type: none"> - Prevention is always the best strategy in Pediatric dentistry - After the lockdown phase, to balance the risks, particularly for children (maximizing the safety and non-aerosol procedures), and the need to satisfy oral health requests - The dental treatment of early childhood caries: to select patients who need dental care and manage them (and their parents/caregivers); use of minimally invasive interventions and rubber dam - To select pediatric patients remotely (telemedicine) - Mouth rinse: Citrox and Amphiphilic β-Cyclodextrin
Ferrazzano et al. [4]	May 22nd	Short communication	<ul style="list-style-type: none"> - During the outbreak: routine dental practice should be postponed and only severe dental emergencies must be treated. - Phone triage; if dental treatment is necessary: child and only one accompanying person enter the dental office wearing masks and shoe-cover, body temperature measurement, wash hands; - Use of PPE: dentists and staff - Clinical setting should be cleaned and disinfected after every clinical session - For children able to split, pre-procedural mouth rinse with 0.5%–1% hydrogen peroxide - Four hands technique, rubber dam, double and high-volume saliva ejectors, anti-retraction hand-pieces, hand instruments are strongly recommended. - Non-cooperative patient: treatment in hospital under sedation/general anesthesia
Ilyas et al. [9]	Jun 26th	Highlights	<ul style="list-style-type: none"> - The current care pathway has been modified to include the option of a virtual video clinic to further aid diagnosis - Bi-weekly meetings are being held virtually, to review our clinical practice and re-evaluating the service in line with the rapidly emerging evidence. - Long-term practice may be changed indefinitely

Table 2 – (continued)

Author	Date	Type of paper	Content/Considerations
Jayaraman et al. [12]	May 15th	Letter to the Editor	- Preventive measures must be strictly applied to avoid transmission of disease in the dental practice
Jurema et al. [14]	Jun 1st	Literature review	- To avoid, whenever possible, procedures that generate aerosols - Remote monitoring by Teledentistry: no urgent situations monitored and assisted by phone - Use of PPE: dentists and staff - Use of rubber dam for all aerosol-producing protocols and to avoid handpieces - ART technique, selective removal of carious, GIC restorations of class II cavities, fluoride, reinforcement of oral hygiene, self-etch adhesive system in cases of anterior fractures - X-Rays: film and/or sensor should preferably be protected with a plastic or disposable latex cover - Parents should also be included in the infection control practices; only one guardian must accompany the child, whenever possible, the physical behavior guidance should be postponed - Guide and monitor the families regarding the child eating habits and to motivate the maintenance of oral hygiene thorough video calling apps
Mallineni et al. [22]	Apr 16th	Editorial	- Dentists should enact universal infection control procedures to the highest standard and champion this behavior through their teams - To promote preventive dental behaviors - It is indicated minimally invasive procedures to minimize or eliminate aerosol generation
Oliveira et al. [15]	Sep 9th	Survey questionnaire	- COVID-19 pandemic has negatively impacted the eating habits and dental care of children in Brazil. - Parents fear COVID-19 and it impacts their behavior regarding seeking dental care for their children.
Paglia [11]	Jun	Editorial	- Evaluate the effectiveness of “Teledentistry” - Avoid procedures that generate aerosols as much as possible, minimizing the use of the air syringe. - When possible to perform minimally invasive procedures and ART (Atraumatic Restorative Treatment). - Avoid more invasive and complex procedures. - Prevention and cure are more efficient, safe, and sustainable - The use of proper PPE is crucial to minimize the risk of transmission - Rethink and review the schedule of daily activities, divided into “no aerosol” and “aerosol” procedures, and “virtual visits” (including management of true emergencies)
Shah [23]	Aug 8th	Narrative review	- Airborne Precautions (airborne infection isolation rooms or single patient rooms, respiratory protection program, N95 respirators). - personal protective equipment (PPE), remove toys, magazines and other frequently touched objects in the waiting area, hand hygiene - Triage by telemedicine (telephones, video-call applications on cell phones, video monitoring or tablets) and manages patients suspected of COVID-19 without a face to face visit. - Clinical care is limited to one patient at a time - Preventive dental caries measures: fluoride, varnish. - Minimally invasive dentistry
Yang et al. [16]	Sep 18th	Retrospective study	- During the pandemic: pulpotomy, pulpectomy, or nonsurgical root canal therapy were not priorities for urgent dental care. Guidelines suggest as first choice: to take medicine - Effective dental emergency triage - The treatment of non-emergencies should be postponed until the release of lockdown - Non-aerosol generating procedures such as interim therapeutic restoration (ITR), Hall crowns and preventive treatments (fluoride, varnish) are alternative approaches. - Use of digital platforms to disseminate oral health education

2.2.3. Clinical practice – dental procedures

Due to the enormous varied situations that may present to dental offices, it is difficult to give specific recommendation for each one. Dentists must rely on their clinical judgment, factoring in the acuity of the symptoms, possible alternative

procedures that may provide relief, and the quality of protective equipment available [12].

Aerosol generating procedures and the use of air syringe must be avoided whenever possible [11,16,17], aiming at the reduction of cross-infection during the treatment [1]. When

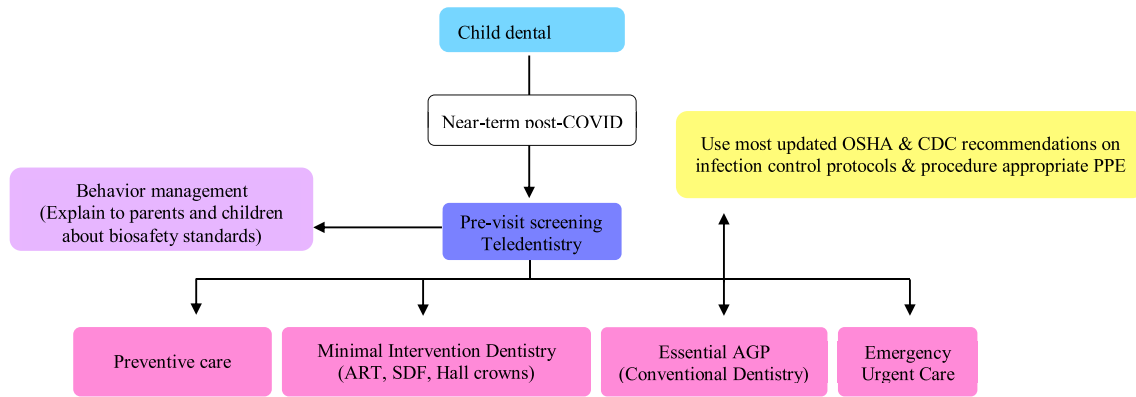


Fig. 2 – Illustrative scheme considering the practice of Pediatric Dentistry post-COVID. (OSHA - Occupational Safety and Health Administration; CDC - Centers for Disease Control and Prevention; PPE - Personal Protective Equipment; ART - Atraumatic Restorative Treatment; SDF - Silver Diamine Fluoride; AGP - aerosol Generating Procedure).

the use of high speed drills are necessary, previous mouth rinse or impregnated gauze with substances capable of reducing the infectious load of SARS-CoV-2 and the use of rubber dam are strongly recommended [1,18,19]. Thus, the non-invasive and the minimally invasive treatments are desirable [1,9,11,13,20,21,23–25].

Additionally, considering SARS-CoV-2, there is not a specific guideline for anesthesia in pediatric patients, so when necessary, the AAPD 2017 [26] guide should be considered. Similarly, X-ray examinations should be considered based on AAPD 2017 [27]. Both do not produce aerosol and therefore are not considered at risk.

2.2.4. Behavior management

Behavioral management in pediatric patients is necessary in contexts of fear, anxiety and pain, aiming the humanization of care and gaining the patient's trust and collaboration during treatment. Calm children spread less aerosol compared to restless and crying children [13,21]. The added anxiety that child might have due to dental healthcare providers having to follow enhanced PPE protocols including face mask, face shields, gowns and coveralls must be taken into consideration. Whenever possible, it is helpful to put this protective equipment on while the child is watching, and while we explain to them in simple words the value and use of this equipment. The child might be encouraged to fantasize that the dentist is putting on special power suits. Last but not least important, making the child dress like the dental staffs could decrease the fear and anxiety seeing everyone in gowns, masks and coveralls [20].

In addition, it is possible to consider the possibility of contacting the family by phone (from conversation to video call) to guide them on how the office environment (without recreational spaces), the professional and team will be different [20].

Taking into consideration the challenges of dealing with children, the need of additional pharmacological behavioral management techniques may be necessary. If non-pharmacological behavioral management techniques alone are insufficient, inhalation sedation (IHS) can be offered as an alternative [9].

It is important to mention that social isolation and the disruption of children's routines may bring physical and psychological consequences that cannot be underestimated. According to SPRANG & SILMAN (2013) [28], post-traumatic distress levels were four times higher in pediatric patients who were in quarantine during epidemic or pandemic events than those who were not in social isolation.

Most children and adolescents have never experienced a pandemic or even social distancing and a strict lockdown imposed by COVID-19. Thus, efforts must be redoubled in order to avoid the risk of physical and psychological repercussions, being parents, psychologists and teachers important allies in the maintenance of psychophysical health and well-being of these children [29].

3. Discussion

Although there is no evidence that aerosols generated from dental care lead to transmission of SARS-CoV-2, guidelines have been recommended given the urgency of the epidemic [30]. Thus, dental practices are being strongly affected by the current pandemic [9]. The pediatric dentistry approach is also being modified [13]. New features and ever-changing evidence-based guidelines have become part of the dental practice daily routine in order to contain the viral spread and the likelihood of a “second peak” [9].

The use of teledentistry is playing an important role in screening patients [1,31,32], enabling partial or complete management of dental clinics at a distance. Besides that, it is a tool for prevention of dental caries and the individual's engagement in health care, improving the quality of patient's management [7]. These new technologies can assist the diagnosis and help in the identification of cases that may or may not be a dental emergency [14–16,25,32].

When the most important phase of the pandemic ends, dental clinical routine will not return immediately to what it was before [18]. With the restrictions mitigation on dental practices, a continuous management through minimally invasive concepts will be relevant [1]. Minimal Intervention Dentistry (MID) has several advantages, which are of significant

importance during the COVID-19 pandemic, since it exposes patients to low risk aerosol, requires less need of local anesthesia and can be executed in a short period of time [16]. Atraumatic Restorative Technique (ART), resin infiltration, sealants, Silver Diamine Fluoride (SDF) application, selective caries removal and the Hall technique are examples of minimally invasive approaches [1,21,25].

By adopting all recommended measures for disease prevention and control, including the proper use of PPE, the risk of exposure to the pathogen must be minimized [1]. It is recommended that dentists wash their hands before children examination, as well as before and after dental procedures. Furthermore, at this moment, dentists should avoid touching their eyes, mouth and nose. In addition, according to the National Association of Italian Dentists the use of eyewear, masks, caps, gloves, face shields, surgical clothes, and shoe-cover are also recommended [4,19].

The pediatric dental care team must inform patients of all the changes in the dental office environment: that it will look different from usual, without toys in the waiting room, in addition to the vestment of the professional team in order to minimize patient's aversion and strangeness [5]. Managing children behavior during dental treatment is extremely important. Restless, crying children spread more aerosol compared to calm children [13]. In addition, handling techniques allow safe and quality treatment [25].

According to AAPD (American Academy of Pediatric Dentistry), it is recommended delaying seeing pediatric patients who require physical behavior management, also considering that treating them while on parent's lap would need special hours in the day dedicated for such patients [33].

The challenges in this new stage will be countless. However, with flexibility, knowledge, and a continuous adaptation process, pediatric dentists can face these challenges and strengthen even more the profession in the future [12].

The return to the elective procedures in Pediatric dentistry will demand the use of enhanced PPE during treatments [13,19,24,31]. It is believed that this new routine of dressing can cause strangeness to children demanding a humanized care of these patients and a behavior management before and during the procedure [20].

4. Conclusion

The Pediatric dentistry practice will require a thorough and explanatory approach with regard to the need for the professional to be dressed up so as to possibly be unrecognizable to that child. Non-aerosol techniques and minimally invasive procedures will be preferable whenever possible. The moment is suitable for the use of preventive practice and for minimally invasive techniques. Due to the constant scientific discoveries, professionals must remain attentive and updated based on the best scientific evidence.

Declaration of competing interest

The authors declare that they have no conflict of interest.

REFERENCES

- [1] Cagetti MG, Cairoli JL, Senna A, Campus G. COVID-19 outbreak in north Italy: an overview on dentistry. A questionnaire survey. *Int J Environ Res Publ Health* 2020;17:e3835.
- [2] Tuñas ITC, Silva ET, Santiago SBS, Maia KD, Silva-Junior GO. Coronavirus disease 2019 (COVID-19): a preventive approach to dentistry. *Braz Dent J* 2020;77:e1766.
- [3] Reis VP, Maia ABP, Bezerra AR, Conde DC. The new normal of dentistry: review of recommendations for the resumption of dental care during the COVID-19 pandemic. *Braz Dent J* 2020;77:e1853.
- [4] Ferrazzano GF, Ingenito A, Cantile T. COVID-19 disease in children: what dentists should know and do to prevent viral spread. The Italian point of view. *Int J Environ Res Publ Health* 2020;17:e3642.
- [5] Amorim LM, Maske TT, Ferreira SH, Santos RB, Feldens CA, Kramer PF. New post-COVID-19 biosafety protocols in pediatric dentistry. *Pesqui Bras em Odontopediatria Clínica Integr* 2020;20:e0117.
- [6] Gomes RL, Pedrosa MS, Silva CHV. Restorative dental treatment in times of COVID-19. *Rev Gaucha Odontol* 2020;68:e20200019.
- [7] Bhanushali P, Katge F, Deshpande S, Chimata VK, Shetty S, Pradhan D. COVID-19: Changing trends and its impact on future of dentistry. *Int Dent J* 2020;8817424.
- [8] Napimoga MH, Freitas ARR. Dentistry vs severe acute respiratory syndrome coronavirus 2: how to face this enemy RGO. *Rev Gaucha Odontol* 2020;68:e20200011.
- [9] Ilyas N, Agel M, Mitchell J, Sood S. COVID-19 pandemic: the first wave - an audit and guidance for pediatric dentistry. *Br Dent J* 2020;228:927–31.
- [10] Maia ABP, Reis VP, Bezerra AR, Conde DC. Recommendations for management and mitigation of aerosol generated by the use of high-speed rotary instruments during the COVID-19 epidemic: an integrative review. *Braz Dent J* 2020;77:e1852.
- [11] Paglia L. COVID-19 and pediatric dentistry after the lockdown. *Eur J Paediatr Dent* 2020;21:89.
- [12] Jayaraman J, Dhar V, Moorani Z, Donly K, Tinanoff N, Mitchell S, et al. Impact of COVID-19 on pediatric dental practice in the United States. *Pediatr Dent* 2020;42:180–3.
- [13] Al-Halabi M, Salami A, Alnuaimi E, Kowash M, Hussein I. Assessment of pediatric dental guidelines and caries management alternatives in the post COVID-19 period. *A Crit Rev Clin Recomm Eur Arch Paediatr Dent* 2020;21:543–56.
- [14] Jurema ALB, Rocha RS, Mailart MC, Souza MY, Gonçalves SEP, Caneppele TMF, et al. Protocols to control contamination and strategies to optimize the clinical practice in Restorative Dentistry during the COVID-19 pandemic. *Braz Dent Sci* 2020;23:1–10.
- [15] Campagnaro R, Collet GO, Andrade MP, Salles JPSL, Fracasso MLC, Scheffel DLS, et al. COVID-19 pandemic and pediatric dentistry: fear, eating habits and parent's oral health perceptions. *Child Youth Serv Rev* 2020. in press.
- [16] Yang F, Yu L, Qin D, Hua F, Song G. Online consultation and emergency management in pediatric dentistry during the COVID-19 Epidemic in Wuhan: a retrospective study. *Int J Paediatr Dent* 2021;31:5–11.
- [17] Martins-Júnior PA, Coutinho DCO, Paiva SM. Implications for dental professionals when caring for pediatric patients. *Evid Base Dent* 2020;21:54–5.
- [18] Cianetti S, Pagano S, Nardone M, Lombardo G. Model for taking care of patients with early childhood caries during the SARS-Cov-2 pandemic. *Int J Environ Res Publ Health* 2020;17:3751.
- [19] Achmad H, Djais AI, Syahrir S, Inayah Y, Wiwik Elnangti W, Fitri A, et al. Impact of COVID-19 in pediatric dentistry: a literature review. *Int J Phys Res* 2020;(Supl 1):830–40.

- [20] Bahramian H, Gharib B, Baghalian A. COVID-19 considerations in pediatric dentistry. *JDR Clin Trans Res* 2020;5:307–11.
- [21] BaniHani A, Gardener C, Raggio DP, Santamaría RM, Albadri S. Could COVID-19 change the way we manage caries in primary teeth? Current implications on Paediatric Dentistry. *Int J Paediatr Dent* 2020;30:523–5.
- [22] Casamassimo PS, Townsend JA, Litch CS. Pediatric dentistry during and after COVID-19. *Pediatr Dent* 2020;42:87–90.
- [23] Mallineni SK, Innes NP, Raggio DP, Araujo MP, Robertson MD, Jayaraman J. Coronavirus disease (COVID-19): characteristics in children and considerations for dentists providing their care. *Int J Paediatr Dent* 2020;30:245–50.
- [24] Shah S. COVID-19 and pediatric dentistry- traversing the challenges. A narrative review. *Ann Med Surg* 2020;58:22–33.
- [25] Cagetti MG, Angelino E. Could SARS-CoV-2 burst the use of Non-Invasive and Minimally Invasive treatments in pediatric dentistry? *Int J Paediatr Dent* 2021;31:27–30.
- [26] American Academy of Pediatric Dentistry. Use of local anesthesia for pediatric dental patients. *Pediatr Dent* 2017;39:266–72.
- [27] American Academy of Pediatric Dentistry (AAPD). Review Council. Prescribing dental radiographs for infants, children, adolescents, and individuals with special health care needs. *AAPD Ref Man* 2017;39:205–7.
- [28] Sprang G, Silman M. Posttraumatic stress disorder in parents and youth after health-related disasters. *Disaster Med Public Health Prep* 2013;7:105–10.
- [29] Pecoraro L, Carbonare LD, De Franceschi L, Piacentini G, Pietrobelli A. The psychophysical impact that COVID-19 has on children must not be underestimated. *Acta Paediatr* 2020;109:1679–80.
- [30] Epstein JB, Chow K, Mathias R. Dental procedure aerosols and COVID-19. *Lancet Infect Dis* 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7417139/pdf/main.pdf>. [Accessed 25 November 2020].
- [31] Acharya S, Singh B, Godhi B, Godhi B, Pandey S. How to deal and learn from the threat of COVID-19 in pediatric dentistry. *Eur J Paediatr Dent* 2020;21:173–5.
- [32] Bhardwaj SS, Alduwayhi S, Bhardwaj A. COVID-19, various treatment options and special considerations for dentistry. *Int Res J Pharmaceut Sci* 2020;32:70–6.
- [33] American Academy of Pediatric Dentistry. Interim infection prevention and control guidance for dental settings during the Coronavirus disease 2019 (COVID-19) Pandemic. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html>. Accessed 23 Sep 2020.