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ORIGINAL ARTICLE

Which Dental Procedures Lead to Greater Distress During Children's Dental Treatment? A Cohort Study

Haline Cunha de Medeiros Maia[1], Bruna Lorena Pereira Moro[1], Carolina de Picoli Acosta[1], Raiza Dias Freitas[1], Mayume Amorim do Vale[1], Ana Carla Crispim[2], José Carlos P. Imparato[1], Daniela Prócida Raggio[1], Mariana Minatel Braga[1], Fausto Medeiros Mendes[1]

[1]Department of Orthodontics and Pediatric Dentistry, School of Dentistry, University of São Paulo, São Paulo, SP, Brazil.
[2]Ayrton Senna Institute, São Paulo, SP, Brazil.

Corresponding author: Fausto Medeiros Mendes **E-mail:** fmmendes@usp.br

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ABSTRACT

Objective: To assess children's self-reported distress during dental procedures and investigate risk factors. **Material and Methods:** A total of 163 children (3–10 years old) were included from a clinical trial on diagnostic strategies for evaluating restorations in primary teeth. Treatment plans were elaborated based on the clinical examination performed at the baseline of the study. Dentists performed 742 dental procedures, and an external evaluator collected children's self-reported distress through the Wong Backer Facial Scale (WBFS) and dentists' opinions about children's behavior during the treatment. Kruskal-Wallis Test was performed to compare the distress and the dentists' perception of the different dental procedures, and multilevel ordered logistic regression analysis was conducted to the evaluate association between explanatory variables and the outcomes. **Results:** More complex procedures caused more distress in children (p=0.017), with a 5.5 times higher risk than simple operative treatments. Similarly, dentists reported children's worse behavior (p<0.001). Older children (older than 7 years) reported less distress than younger children (OR 0.52; CI 0.30-0.87; p=0.014). Patients reported greater distress in the first consultations, reducing the chance of higher scores by 16% in the next interventions. **Conclusion:** Children experience higher levels of distress during their first treatment appointments. More complex operative procedures and the child's age below 7 years were risk factors associated with greater distress during dental treatment.

Keywords: Dental Caries; Dental Anxiety; Behavior Control.

Introduction

Dental anxiety is a universal phenomenon that negatively impacts oral health-related quality of life in children and adults [1]. It is a state of apprehension in which patients think that something dreadful will happen concerning their dental treatment, and it is coupled with a sense of losing control [2]. Recent findings estimate the global prevalence of dental anxiety in children and adolescents as around 24% [3]. However, there is some uncertainty in the scientific literature regarding the conceptualization of dental anxiety, dental fear, and/or distress. Dental fear is an emotional reaction to one or more specific threatening stimuli in a dental setting (e.g., needles, drilling). Similarly, dental anxiety also relates to dental fear; however, it refers to a heightened fear of dental procedures, which might or might not fulfill the criteria for dental phobia. In this case, it can lead to avoidance-type of behavior in dental settings [4]. On the other hand, distress is a feeling that involves an unpleasant emotional state with a certain degree of activation [5]. Distress can anticipate the child's pain and can be noticed through gestures, facial expressions, eye movements or body movements [6]. Thus, it relates to a displeasing feeling, but it does not necessarily involve fear, although it can lead to it. Berde and Wolfe [7] define that behaviorally anxiety and pain are difficult to distinguish, so the combination of these feelings could be defined as distress.

Assessing pain and distress feelings in children is challenging. In general, there are self-report or observation-based instruments. In dental settings, observation-based instruments rely on behavior rating scales, which are filled by dentists/observers, and they evaluate the child's behavior. Nevertheless, when investigating feelings in young children, self-report measures may be equally appropriate, especially if they are picture-based [4]. Various measures have been developed to elicit self-reports of pain from children, such as the Wong Baker Faces Pain Rating Scale [8]. Hence, the combination of multiple modalities (e.g., self-report and observations) is likely the more parsimonious approach to investigate these phenomena, given that the use of one or another strategy only could under or overestimate their overall experience and erroneously influence management approaches [9].

Although dental caries is the most prevalent oral disease in children [10] and involves most procedures performed in daily clinical practice, there are few studies evaluating children's distress during dental care, and none of them monitored the children throughout the treatment, only one procedure per child. Therefore, the sample size of these articles was not as significant: Hoge et al. [11] assessed distress in 148 children in a single visit; Karibe et al. [12] performed 135 procedures on 40 children, but only 15 were highly complex; Baroni et al. [13] assessed distress during minimally invasive treatments in 31 children under sedation. Pediatric dentists should be prepared to meet their dentally distressed patients [3]. Patients avoid making dental visits because of their fear, which results in a worsening of problems if not managed appropriately, requiring more intensive and potentially traumatic treatment, which then reinforces or exacerbates the fear, which leads to continued avoidance [14]. Besides, dental distress is likely to continue into adulthood and has long-term negative implications for oral health [15,16].

Therefore, dentists need to know what factors lead to greater distress during the management and treatment of dental caries, intending to reduce uncomfortable situations associated with dental appointments during the Pediatric Dentistry practice [4]. Thus, the present study aimed to assess the children's perceived distress during different treatments of caries. The working hypothesis is that younger children submitted to more complex operative treatments for caries will report more distress. A secondary aim was to evaluated children's behavior according to the dentist's perception.

Material and Methods

Study Design and Ethics Approval

This is a cohort study conducted in a Dental School. This manuscript was written according to the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) and the checklist is presented in Appendix A in Online Supplementary Material. The local committee for ethics in research approved this study (registration no. 2.291.642). Written informed consent was obtained from all parents/caregivers and an assent form was signed by literate children.

This research is nested in a Randomized Clinical Trial (RCT) performed to assess the effect of using two different diagnostic strategies for caries lesions detection around restorations in primary teeth. In the context of the present study, the treatments were considered as exposure variables, with distress being the outcome variable. Because the explanatory variables precede the outcomes, this was considered a cohort study. The main clinical trial, named CARies DEtection in Children trial nº 3 (CARDEC-03) is registered at the platform Clinicaltrials.gov (NCT03520309). The CARDEC-03 study protocol is published elsewhere and contains more information about the trial [17].

Participants Selection

All participants included in the main trial were included in the present study. For the trial, children aged three to 10 years old were randomly selected from a list of patients who sought dental treatment at the School of Dentistry from November 2017 to November 2018. The inclusion criteria were children: (1) whose parents sought dental treatment at the School of Dentistry; (2) from three to 10 years old; (3) presenting at least one restoration of any kind of restorative material on a primary tooth regardless of its condition; (4) with the presence of at least one active carious lesion on a primary tooth. The exclusion criteria were children: (1) whose parents did not agree to participate in the study; (2) who did not agree to participate or showed severe behavioral problems during the initial appointment.

The sample size calculation was based on the primary outcome of the RCT [17], which was the percentage of restorations requiring reintervention, reaching a minimum of 626 restored primary teeth in 163 children. The distress during the dental procedures for caries treatment performed at the baseline of the RCT was evaluated in this study.

Setting

This study was conducted at the Pediatric Dentistry Clinic of the School of Dentistry, University of Sao Paulo. Initially, children underwent visual inspection performed by an examiner (LRAP) who did not participate in the subsequent phases of the study. It was performed according to the International Caries Detection and Assessment System (ICDAS) described in the CariesCare 4D [18] to detect and assess the coronal caries lesions stage and activity. A plane buccal mirror, a ball-ended probe, and cotton wool rolls were used for the visual and tactile assessments under artificial light, after professional dental cleaning.

For the treatment plan, the order of the procedures started with simpler procedures to more complex procedures, except in children who needed urgent dental care. Carrying out procedures from the simplest to the most complex is fundamental for the best management of children in the dental practice. In addition, we will be able to relate distress to the complexity of the treatment that took place at each appointment. During all the appointments, the children could be subjected to behavioral management techniques according to their individual

needs. The most commonly used techniques were talk-show-do and distraction techniques such as music or storytelling.

A specific sheet containing the planning was delivered to the researchers responsible for accomplishing the treatment in children and more than one procedure could be performed in each dental appointment. In the subsequent appointments, dental treatments following a predefined protocol were performed by postgraduate dental students in Pediatric Dentistry. All participants in this study received full dental treatment, except orthodontics. To draw up the treatment plan, the researchers considered that in the first stage of treatment, the child should undergo a radiographic examination when necessary, dental prophylaxis, scaling, fluoride application (fluoride gel or fluoride varnish), sealants (ionomeric or resin) and restoration repair. In the second stage, the plan includes changing restorations and making new restorations (with glass ionomer cement or composite resin), always using hand instruments and minimal use of rotary instruments. In the third stage of treatment, more complex treatments involving local anesthesia will be carried out, such as endodontic treatment and tooth extraction. Children's distress and dentists' perception regarding children's behavior after each procedure designated on the treatment plan was assessed.

Children's Self-Reported Distress

The distress reported by the children was assessed using the Wong Baker Facial Scale (WBFS) (Figure 1) [8]. The scale presents a series of six facial expressions illustrating a spectrum of distress intensity. The first facial expression is represented by a face with a smile, followed by five faces that gradually change their expression, the latter being a sad face with tears.

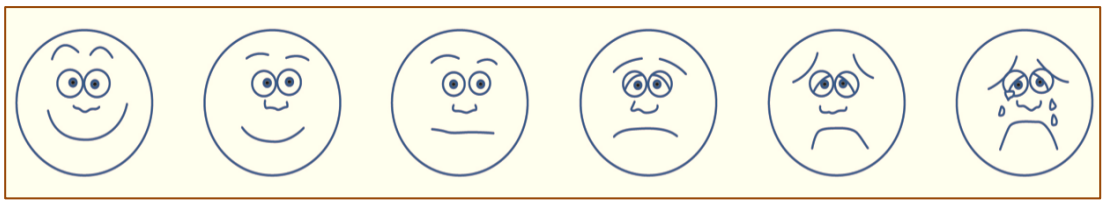

Figure 1. Wong Backer Facial Scale.

After the children's first procedure, it was explained that they would be asked to point to the face that best represented how she/he felt after each intervention. Then, immediately after the dental procedure, an external evaluator (RDF) asked the following question to the child: "How did you feel when treating your toothy?". The external evaluator (RDF) accountable for asking the question was not present during the dental interventions. The dentists responsible for the interventions were not present when the question was asked to children. The data were turned into an ordinal six-point scale from 1 to 6.

Children's Behavior According to the Dentist's Perception

The same evaluator (RDF) also asked the dentist "How did the child behave during this procedure?". Clinicians were unaware of the children's responses. Standardized answers to this question were established: presented a lot of difficulties (5), presented some difficulty (4), indifferent (3), cooperated reasonably (2), and cooperated well (1). This information was transformed on a numeric scale from 1 to 5.

The following were considered difficulties during treatment: crying during treatment, body movements that prevented the procedure from taking place, trying to close the mouth during treatment, and trying to escape

from treatment. Cooperation was considered to be staying still during the procedure, keeping the mouth open, and accepting the conditions presented by the dentist.

Explanatory Variables and Outcomes

The explanatory variables related to children were sex; age (3–6 years old and 7–10 years old); number of decayed, missing due to caries, and filled primary and permanent teeth (dmf-t + DMF-T = 1 to 6 or dmf-t + DMF-T > 6); dmft+DMF-T (quantitative variable) and if the participant was submitted to dental anesthesia previously (yes or no). Moreover, the explanatory variables related to the dental procedures for caries treatment were radiographs, professional fluoride application, dental scaling, sealants, restoration repair, restoration replacement, restorative treatment, endodontic treatment, and tooth extraction. Other considered explanatory variables were if the dental procedure was performed with anesthesia (yes or no) and the order of procedure. Data such as age, caries experience, degree of treatment complexity and previous anesthetic experience will be analyzed to see if they are risk factors for children's distress during dental treatment.

This study's main outcome was the self-report distress by the children who underwent oral health procedures for the treatment of dental caries. For this, the variable was treated as an ordinal variable. Another outcome was the children's behavior according to dentists' perception (ordinal variable).

Data Analysis

Descriptive analyses of the children's characteristics and performed procedures were conducted. The procedures were categorized according to the complexity degree, as follows: non-operative procedures (radiography, fluoride application, scaling, sealant, and restoration repair), simple operative procedures (restoration replacement and new restoration), and complex operative procedures (endodontic treatment, tooth extraction). Kruskal-Wallis Test with Conover post hoc analysis was performed to compare the distress and the dentists' perception for the different groups of dental procedures.

After that, the dental procedures were categorized into non-operative treatments, simple operative treatments, and more complex operative treatments. Multilevel ordered logistic regression analysis was conducted to evaluate whether the independent variables exerted an influence on children's distress and the children's behavior according to the dentist's perception. The values of the Odds Ratio (OR) and respective 95% confidence intervals (95%CI) were calculated. Univariate and multiple regression analyses were performed. For the final model, only the variables of interest to the study question, and other possible confounding variables were included. Data were analyzed using Stata 13.0 (Stata Corp LP, College Station, EUA), the significance level was set at 5%.

Results

One hundred and sixty-three children were included from November 2017 to July 2019 and assessed in this study. Among these, 87 (53.4%) were boys and 76 (46.6%) girls, and the mean age (SD) of the sample was 7.1 years (±1.6). The sample was balanced across the two age groups, consisting of 80 patients aged up to 7 years and 83 patients older than 7 years. Among the patients younger than 7 years (n=80), nearly 90% are 5 (n=32) and 6 (n=30) years old. In contrast, 3-year-old children constitute the smallest group within this cohort (n=3), followed by 4-year-olds (n=12). Children older than 7 years (n=83) are more evenly distributed, with the majority being between 7 and 9 years (n=80) and only 3 children being 10 years old.

A total of 742 dental procedures were performed. Regarding caries experience, 89 (54.6%) had a dmf-t + DMF-T from 1 to 6, and 74 (45.4%) had a dmf-t + DMF-T greater than 6. Most children (71%) had already been anesthetized during dental treatment before participating in this study. The types of different dental procedures classified as non-operative, simple, and complex operative procedures are shown in Figure 2. The non-operative category comprised the majority (82.1%) of treatments performed by dentists. Professional fluoride application and sealants were the most frequent interventions within the non-operative category (Figure 2). Restorative treatments were more frequently performed than restorations replacement among the simple operative procedures, and tooth extraction was the most recurrent complex operative procedure (Figure 2). Dental scaling procedures were excluded from further analysis (n = 2).

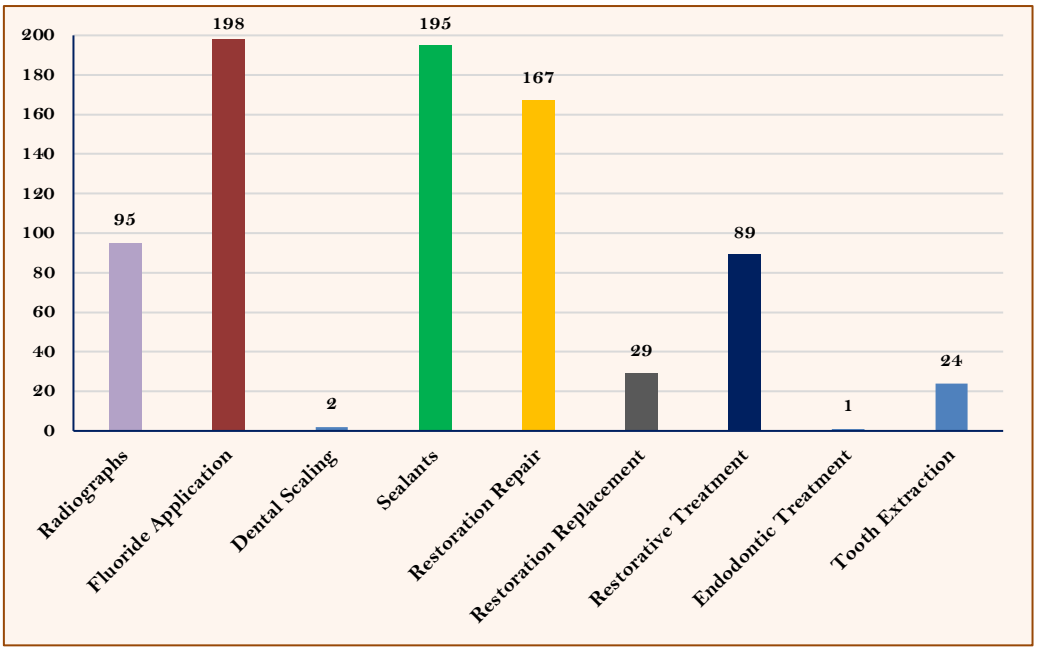

Figure 2. Descriptive analysis of different dental procedures performed in the children according to complexity degree.

Endodontic treatment and tooth extraction exhibited the highest scores of children's self-report distress (Table 1). Therefore, the complex operative procedures caused more distress in children than simple and non-operative procedures (Table 1). The dentists indicated that the child's behavior was more uncooperative during the complex operative procedures when compared to all other procedures (Table 1).

Table 1. Reported distress by the child and dentist's opinion regarding the child's behavior concerning different procedures for caries treatment.

Variables	Children's Distress (Wong-Baker Scale)			Children's Behavior according to Dentist's Opinion		
	N	Mean (SD)	Median (IQ)	N	Mean (SD)	Median (IQ)
Radiographs	92	1.7 (1.2)	1.0 [a] (1.0 to 2.0)	85	1.2 (0.8)	1.0 [a] (1.0 to 1.0)
Fluoride application	196	1.7 (1.1)	1.0 [a] (1.0 to 2.0)	188	1.1 (0.5)	1.0 [a] (1.0 to 1.0)
Sealant	194	1.4 (0.7)	1.0 [a] (1.0 to 2.0)	181	1.1 (0.5)	1.0 [a] (1.0 to 1.0)
Restoration repair	160	1.6 (1.1)	1.0 [a] (1.0 to 2.0)	161	1.2 (0.7)	1.0 [a] (1.0 to 1.0)
Restorative treatment	113	1.5 (1.0)	1.0 [a] (1.0 to 2.0)	112	1.2 (0.7)	1.0 [a] (1.0 to 1.0)
Endodontics / tooth extraction	25	3.0 (2.3)	2.0 [b] (1.0 to 6.0)	25	2.0 (1.7)	1.0 [b] (1.0 to 2.5)
p-value *			0.017			<0.001

SD: Standard Deviation; IQ = Interquartile Range; *Calculated by Kruskal-Wallis test; Different letters represent statistically significant differences ($p<0.05$) among the type of dental procedures in the same column.

Ordered logistic regression analysis demonstrated that the procedure's complexity influenced the patients' distress (Table 2). Children submitted to more complex operative treatments presented around 5.5 times more chance to report greater distress than after simple operative procedures (Table 2). Moreover, children aged seven years or more significantly presented lower scores of distress when compared to children younger than seven years old (Table 2). The order in which procedures were performed also influenced children's distress. Patients reported higher scores during the first dental procedure and the chance of having higher scores of distress was reduced by 16% in the following interventions (Table 2).

Table 2. Association among children's distress and dental procedure performed and other explanatory variables.

Explanatory Variables	Odds Ratio Non-Adjusted (95% CI)	p-value	Odds Ratio Adjusted (95% CI)	p-value
Type of Procedure				
Simple operative treatments	1.00		1.00	
Non-operative treatments	1.46 (0.86 - 2.48)	0.161	1.69 (0.92 - 3.11)	0.091
Complex operative treatments	6.23 (2.23 - 17.39)	<0.001	5.53 (1.70 - 18.01)	0.004
Sex			*	
Male	1.00			
Female	1.67 (0.99-1.53)	0.055		
Age				
Less than 7 years	1.00		1.00	
7 years or more	0.53 (0.31 - 0.90)	0.019	0.52 (0.30 - 0.87)	0.014
Caries experience			*	
dmf-t + DMF-T 1 to 6	1.00			
dmf-t + DMF-T > 6	0.91 (0.54 - 1.53)	0.716		
Submitted to Anesthesia Before			*	
No	1.00			
Yes	0.96 (0.54 - 1.71)	0.889		
Procedure with Anesthesia				
No	1.00		1.00	
Yes	1.80 (0.92 - 3.50)	0.084	1.29 (0.47 - 3.47)	0.620
Order of Procedure	0.84 (0.75 - 0.94)	0.003	0.84 (0.75 - 0.95)	0.004

*Variables not included in the final adjusted model; 95% CI = 95% Confidence Intervals; dmf-t = number of decayed, missed, or filled primary teeth; DMF-T = dmf-t = number of decayed, missed, or filled permanent teeth.

Concerning the classification of children's behavior according to the dentist's perception, more complex procedures tended to present higher scores of negative behavior in the univariate analysis, although with no statistically significant differences. On the other hand, dental procedures that needed dental anesthesia had higher scores of negative behavior (Table 3). However, in the multiple analysis, no explanatory variable influences significantly the children's behavior classified by the clinicians (Table 3).

Table 3. Association among dentists' perception on children behavior and dental procedure performed and other explanatory variables.

Variables	Odds Ratio Non-Adjusted (95% IC)	p-value	Odds Ratio Adjusted (95% IC)	p-value
Type of Procedure				
Simple operative treatments	1.00		1.00	
Non-operative treatments	0.58 (0.20 - 1.66)	0.309	0.67 (0.22 - 2.10)	0.501
Complex operative treatments	5.21 (0.91 - 29.77)	0.063	4.92 (0.60 - 40.52)	0.138
Sex				
Male	1.00			
Female	0.78 (0.18 - 3.32)	0.742		
Age				
Less than 7 years	1.00		1.00	

7 years or more	0.28 (0.06 - 1.26)	0.097	0.28 (0.06 - 1.32)	0.106
Caries Experience				
dmf-t + DMF-T 1 to 6	1.00			
dmf-t + DMF-T > 6	1.72 (0.41 - 7.22)	0.458		
Submitted to Anesthesia Before				
No	1.00			
Yes	1.32 (0.26 - 6.69)	0.732		
Procedure with Anesthesia				
No	1.00		1.00	
Yes	4.76 (1.43 - 15.77)	0.011	1.48 (0.22 - 10.04)	0.687
Order of Procedure	1.10 (0.86 - 1.40)	0.452	1.15 (0.90 - 1.48)	0.272

*Variables not included in the final adjusted model; 95% CI = 95% Confidence Intervals; dmf-t = number of decayed, missed, or filled primary teeth; DMF-T = dmf-t = number of decayed, missed, or filled permanent teeth.

Discussion

Dental caries management in pediatric dentistry should be focused on the patients' relief of pain and distress. However, since dentists are trained to be focused on the technical aspects of treatment, patients' stress and pain are usually neglected in the dental office [19]. In this study, which dental treatments for caries management exert more or less influence on children's distress were explored. The present findings demonstrated that children who submitted to complex operative procedures reported more distress than children who submitted to simple and non-operative procedures. The sight, sensation, and fear of pain from the needle and dental drill have been frequently reported to be the most fear-evoking stimuli for dentally anxious children [20,21].

There are four main triggers for anxiety in the dental environment: visual (needles or drills), sensation (high frequency of vibrations or pressure), sounds (high-speed rotation), and smells (sodium hypochlorite) [22]. The endodontic treatment and tooth extraction involve some of these triggers and, for both, local anesthesia is required. In this study, the minimal intervention approach [23] was used to manage dental caries, using hand instruments for selective removal of carious tissue, which might be associated with less distress reported by children during restoration repairs and restorative treatments [24]. Many researchers have proposed using distraction techniques (e.g., audiovisual distraction and camouflaging syringes) to manage distress and fear in pediatric dental practice to reduce these feelings during dental treatment [25]. Nevertheless, more robust and well-conducted RCTs are still needed to demonstrate their effectiveness [24].

Moreover, this study showed that younger children reported more distress than older ones. The understanding of dental treatment is different between younger and older children, and the younger patients have fewer experiences with dental care, implying more novel and fear-provoking situations [2]. Previous studies in the medical field have shown that adolescents use more cognitive coping strategies to respond to pain than younger children [26]. Regulating emotions require social, cognitive, and affective skills and a capacity for effortful control that the young child may not yet be mature enough to manage fully [2].

In addition to the child's age, the order of procedures was associated with children's perception of distress. It was observed that distress decreased from the first to the subsequent dental procedures. There is evidence showing that children report less discomfort when appointments begin with an easier procedure and work up to a more difficult one [27]. Therefore, systematic desensitization over the appointments might be associated with decreased children's distress when submitted to oral health interventions [28]. In this study, all dental procedures were conducted by postgraduate dental students in Pediatric Dentistry. They are well-trained to use behavioral management techniques to enhance trust, increase feelings of control, and support children with dental anxiety or fear [27]. Some of these psychological techniques regularly employed by pediatric dentists

are clear explanations to the child and procedural information, “tell-show-do”, stop signaling methods and devices, positive feedback during procedures, and positive reinforcement [29]. These techniques have been previously shown to be effective in the reduction of children’s dental anxiety [29].

In the present study, the child's perceived distress was measured using the WBFS, originally developed for reporting pain severity [8]. The distress is more than simply pain and, in dental settings, it can comprise a core of sensory pain experience, an unpleasant feeling and it can be accompanied by momentary situation-specific anxiety [30]. Distress can be understood as a feeling that is close to nervousness or tension in the model used by neuroscience and psychology known as the "circumplex of affect" [5,31]. According to this concept, feelings similar to distress are categorized as unpleasant feelings with high activation. When emotions and other emotional states are analyzed in this model, fear and anxiety are located close to distress, which means that they elicit similar levels of valence and activation [5,31]. Although the current literature presents other studies that support the use of WBFS to measure children's emotional states, such as discomfort and distress [32,33], we know that the use of WBFS is a limitation of this study, as there are other validated and more accurate instruments and tests for measuring distress, such as the FLACC scale (Face, Legs, Activity, Cry and Consolability) [13] and clinical tests such as salivary alpha amylase [12].

In this study, we explored a diverse age range, comprising preschoolers to 10-year-old children. This range may present a spectrum of responses on the WBFS. Our analysis distinguished between children aged up to 7 years and those older than 7, aiming to account for potential variations in pain perception and reporting. It is crucial to acknowledge the challenge in assessing self-reported measures in preschool children. For instance, as many as one-third of children who are 3 and 4 years old tend to use only the extreme ends of the scales, perceiving them as binary instead of as continuous, graded measures [34]. Despite potential limitations in employing the WBFS due to its usage by 3 and 4-year-olds—who constitute only a minor portion of our study sample (1,8% and 7,4%, respectively)—their data do not significantly impact the overall results of our analysis. Furthermore, less than 3% of existing studies provide data for this age group [35], and currently, there is no established guideline for the optimal scale for self-reported pain intensity in children under 6 years [36]. Therefore, while acknowledging these limitations, our study still provides valuable insights into the distress experienced by children subjected to different dental procedures.

The distress can determine the future child's behavior in the dental office and give rise to impressions that may be enduring [4,30]. For this reason, the dentist’s experience when treating the patient is a relevant measure to be used in association with the child’s self-report. The pediatric dentist’s observational scales can quantify children’s apparent behavioral manifestations of distress and self-report can tap children’s perceptions of their distress [9]. However, in the present study, no explanatory variable was associated with the children's behavior according to the dentist's perception. A possible explanation for this finding is that all children included have already received dental treatment. Since the present study is nested in an RCT, the participants should have at least one restoration in a primary tooth to be included. Children's imagination could influence their negative perceptions of dental treatment [37] and children who did not receive invasive dental procedures are most anxious than those who received it [38]. In this way, different results could be found if the study has also evaluated children who had never received dental treatment for the caries management, with possibly self-reported more distress and more uncooperative and disruptive behaviors perceived by the dentists. Other possible explanation could be related to the method for assessing this variable. Other methods to evaluate the children’s behavior, such as the Frankl scale, could be more discriminative to identify differences among the dental procedures and increase the comparability with other studies.

Although a self-report scale was used, the children were asked by an external evaluator how they felt after the treatment, pointing at that moment to the face on the WBFS. It is believed that exempting the dentist who carried out the procedure from this role makes the child's report more reliable, free from any influence of the child's feelings towards the professional who attended them. This is the first study to investigate the children's self-reported distress submitted to different dental procedures for caries management. It was employed an appropriate and easy-to-understand instrument for distress assessment in the respective age group of children aged three and older. Therefore, the present study provides evidence that efforts and actions must be focused to minimize the distress in children under seven years and children submitted to complex operative procedures. Future RCTs comparing different distraction techniques and psychological strategies to minimize distress in this age group are encouraged.

Conclusion

Complex operative procedures for caries management lead to greater distress in children than non-operative and simple operative procedures. Children under seven years old submitted to dental procedures are more prone to self-report distress than older children.

Authors' Contributions

HCMM	https://orcid.org/0000-0003-1777-9893	Validation, Investigation, Resources, Writing - Original Draft and Writing - Review and Editing.
BLPM	https://orcid.org/0000-0003-1859-1702	Conceptualization, Methodology, Investigation, Writing - Original Draft and Writing - Review and Editing.
CPA	https://orcid.org/0000-0003-3321-3128	Validation and Writing - Review and Editing.
RDF	https://orcid.org/0000-0002-3205-8253	Validation, Investigation and Writing - Review and Editing.
MAV	https://orcid.org/0000-0002-4057-766X	Validation, Investigation and Writing - Review and Editing.
ACC	https://orcid.org/0000-0003-3434-5667	Writing - Review and Editing and Visualization.
JCPI	https://orcid.org/0000-0002-1990-2851	Conceptualization, Methodology, Formal Analysis, Investigation, Writing - Review and Editing, Visualization and Project Administration.
DPR	https://orcid.org/0000-0002-0048-2068	Conceptualization, Methodology, Formal Analysis, Investigation, Writing - Review and Editing, Visualization, Supervision and Project Administration.
MMB	https://orcid.org/0000-0002-4469-6500	Conceptualization, Methodology, Formal Analysis, Investigation, Writing - Review and Editing and Supervision.
FMM	https://orcid.org/0000-0003-1711-4103	Conceptualization, Methodology, Formal Analysis, Writing - Review and Editing, Supervision and Funding Acquisition.

All authors declare that they contributed to 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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