The effect of the parental presence–absence technique on children's behaviour in the dental clinic

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Abstract

Objective The presence of the parent could influence the behaviour of the child during the dental visit. The objective of this study was to assess the effect of the Parental Presence-Absence Technique (PPAT) on the behaviour of anxious children receiving dental restoration under local anaesthesia.

Methods A cohort prospective observational study of a statistically calculated sample size with 80% power, recruited 84 anxious children ages 6–9-year-old who scored ≥26 on the Abeer Children Dental Anxiety Scale (ACDAS) over two visits. Forty-two children were allocated to either the Parental Presence (PP) or the Parental Absence (PA) group to have one composite restoration under local anaesthesia. Statistical analysis: A two-sample t-test was used to compare differences in the mean of ACDAS between the PP and the PA groups, and between boys and girls. The P-value of ≤0.05 was set for a statistically significant result.

Results A higher dental anxiety score on ACDAS was reported in the PP group than in the PA group ($p < 0.001$ and the 95% confidence interval (CI) was -0.81 to -0.28). There was no significant difference in the mean of ACDAS between boys and girls ($p=0.47$ and the 95% CI was -0.25 to -0.38).

Conclusions The use of the PPAT in children aged 6-9-year appears to be an effective method to improve children's behaviour when having dental restorations under local anaesthesia.

KEYWORDS Children, Parent's presence, Dental anxiety, Local anaesthesia, Behaviour.

Introduction

Dentists face daily challenges when dealing with anxious young children. A dentist who treats children should be capable of precisely evaluating the child's growth; physical, cognitive, emotional, language, social, and dental developmental levels [American Academy of Pediatric Dentistry, 2020]. Paediatric dentists must know about children's dental attitudes and temperaments to anticipate their reactions to dental care [American Academy of Pediatric Dentistry, 2020]. The Faculty of Dental Surgery at the Royal College of Surgeons of England stated that "Children are not small adults; thus, an understanding of child development is crucial if behaviour management techniques are to be used effectively. The approach and language used with each child can then be modified to match their abilities and understanding" [The Royal College of Surgeons of England and Faculty of Dental Surgery, 2002].

Although anxiety relates to fear, it is not the same condition. The definitions of fear and anxiety are often confused in literature [Klingberg and Broberg, 2007]. Dental anxiety is a state of apprehension that something frightful is going to happen concerning dental treatment, and it is often associated with a sense of losing control. Fear is a normal emotional reaction to one or more specific threatening stimuli in the dental situation; however, dental phobia represents a severe type of dental anxiety and is characterised by clear and persistent anxiety towards either detectable situations (drilling, injections) or the dental situation in general [Klingberg and Broberg, 2007]. Alternatively, dental behaviour management problem is a collective term for uncooperative and disruptive behaviours, which results in a delay of treatment or makes it impossible.

Studying and understanding dental fear and anxiety and how they affect children's behaviour and compliance at the clinic are important factors to be considered when preparing a treatment plan. Several studies found that parental dental anxiety [specifically mothers] could have an impact on the anxiety level of their children and influence their behaviours [Alhareky et al., 2021; Swapnali and Rahul, 2017; The British Society of Paediatric Dentistry, 2011; Thribhuvanan et al., 2021].

Children's behaviour and compliance are important factors to be considered in any dental or medical treatment plan. It can be categorised as cooperative, potentially cooperative, and lacking cooperative ability [The Royal College of Surgeons

of England and Faculty of Dental Surgery, 2002]. The use of the uncooperative term is inaccurate with children who lack cooperative ability, including children with particular disabilities with whom cooperation in the common method can never be accomplished, in addition to pre-cooperative children who are young to communicate effectively [American Academy of Pediatric Dentistry, 2020 and The Royal College of Surgeons of England-Faculty of Dental Surgery, 2002]. Therefore, all non-pharmacological behaviour management techniques are only suitable for cooperative and potentially cooperative children [The Royal College of Surgeons of England- Faculty of Dental Surgery, 2002].

Dental anxiety in children may increase when parents are not capable of concealing their anxieties [The British Society of Paediatric Dentistry, 2011]; therefore selective parent exclusion (SPE) is being used in dental practice, which is considered a negative reinforcement of the non-pharmacological behaviour management methods [The British Society of Paediatric Dentistry, 2011]. The SPE method can be used in children who are older than four years to avoid what is called separation anxiety. However, parental consent to use the SPE method is recommended [Masi et al., 2001]. The SPE method is also called the Parental Presence-Absence Technique (PPAT) and cannot be used in children with intellectual or emotional impairment [American Academy of Pediatric Dentistry, 2020]. The use of the PPAT is a controversial topic in the non-pharmacological behaviour management methods of paediatric dentistry. A systematic review by De Luca, et al. found that the parent's presence (PP) in the dental clinic does not affect children's behaviour. However, these results were with very low certainty of the evidence, so they suggested the need for better-designed trials to understand this issue effectively [De Luca et al., 2021]. Another study by Boka, et al. concluded that the use of the PPAT in children aged 3-8 years, who were treated by paediatric dentistry postgraduate students [not consultants] revealed no benefit over other non-pharmacological behaviour management techniques [Boka et al., 2017].

In contrast, a review by Riba, et al. stated that "dentists used to exclude parents from the dental operatory to avoid their interference with the dentist's ability to build a rapport and relationship with the child, hence increasing child's management problems, disrupting treatment, and making the dentist unfocused and uncomfortable" [Riba et al., 2018]. A study by Swapnali, et al. found that parental dental anxiety could impact the anxiety levels of their children [Swapnali and Rahul, 2017]. Similarly, a positive correlation was found between physiologic parameters [heart rate and blood pressure] and the scores of dental anxiety of the children and their parents [Thribhuvanan et al., 2021]. In addition, a higher primary teeth caries rate was detected in the children of anxious mothers than in the children of mothers who were not dentally anxious [Alhareky et al., 2021]. Therefore, the objective of this study was to evaluate the effect of the PPAT on the behaviour of anxious children during the application of a restorative treatment under local anaesthesia.

Materials and methods

Study design

A cohort prospective observational study that involved 84 children aged between 6 and 9 years.

Study participants and setting

This study has a statistically calculated sample size with 80% power, the study included 84 children aged 6-9-year-old who had attended the paediatric dental clinic at a local hospital in Al-Madinah, Saudi Arabia.

Abeer Children Dental Anxiety Scale (ACDAS)

Date: age: Gender: M / F

A. THE DENTAL PART

I would like you please to tell me how relaxed or scared you feel at the dentist. Please use the scale below **from 1 to 3**, and tick (√) under the face that shows us **how you feel now**.

1=Happy 2=OK 3=Scared

How do you feel about:	1	2	3
1. *Sitting in the waiting room?*			
2. *A dentist wearing a mask on his face?*			
3. *Laying flat on the dental chair?*			
4. *A dentist checking your teeth with a mirror?*			
5. *Having a strange taste in your mouth e.g. a filling or gloves?*			
6. *Having a "pinch" feeling in your gum?*			
7. *The feeling of numbness (fat lip or tongue)?*			
8. *A dentist cleaning your teeth by buzzy electric arm that's spraying water?*			
9. *The sounds that you hear at the dentist?*			
10. *The smell at the dentist?*			
11. *Having a tooth taken out?*			
12. *Wearing a small rubbery mask on your nose to breathe special gas to help you feel comfortable during treatment?*			
13. *Having a "pinch" feeling on the back of your hand?*			

B. THE COGNITIVE PART

14. Do you feel shy at the dentist? **1. Yes 2. No**
15. Do you feel shy because of the way your teeth look? **1. Yes 2. No**
16. Are you worried about losing control at the dentist? **1. Yes 2. No**

C. THE CHILD ASSESSMENT

For legal guardian: 17. Has your child had previous dental treatment? **1. Yes 2. No**

18. How do you expect your child's behaviour today?

1. Happy 2. OK 3. Scared

For Operator: 19. At the end of this visit, what is your rating for the child's behaviour?

1. Happy 2. OK 3. Scared

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FIG. 1 ACDAS

Inclusion and exclusion criteria

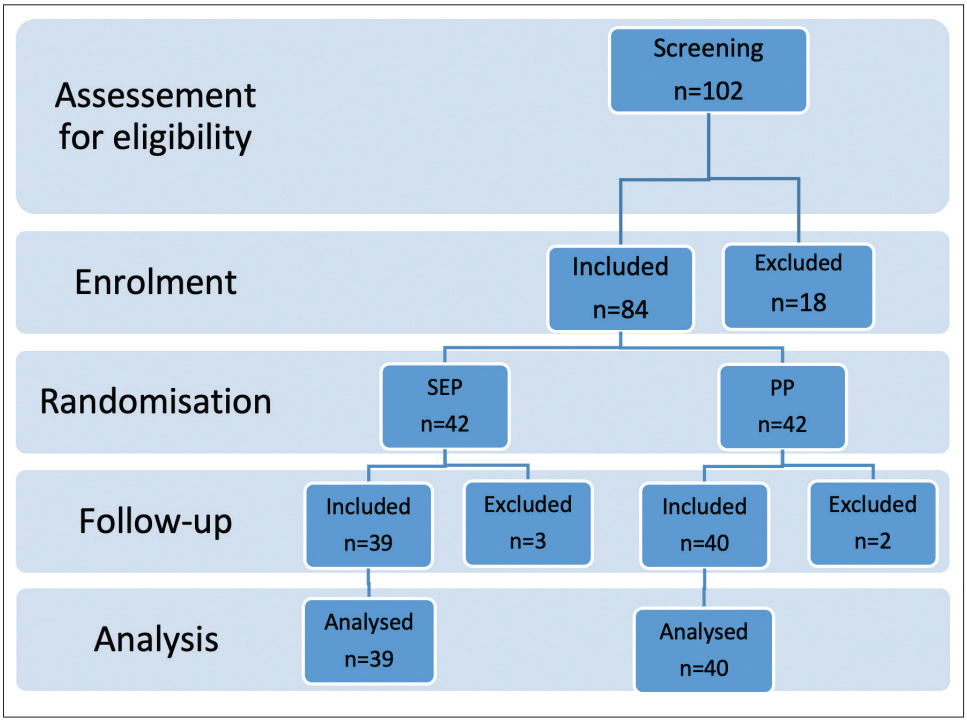
The inclusion criteria involved: healthy children based on the American Society of Anaesthesiologists (ASA), ASA1, and ASA2, children aged 6 9-year-old with no learning disabilities, children and parents who were able to speak and understand Arabic or English, children who have a carious primary molar that was not involved in pulpal tissues, and anxious children [scored (≥26) on the English or Arabic versions of Abeer Cognitive Dental Anxiety Scale (ACDAS)] [Al-Namankany et al., 2012 and Al-Namankany et al., 2014] (figure.1).

Children with learning disabilities or who needed emergency dental treatments were excluded from the study. Also, parents who later changed their minds and refused to leave their children during the dental treatment were excluded along with their children. The study was conducted from April 2021 to May 2022. The assessment for the eligibility to participate in the study involved 102 children of which 84 children met the inclusion criteria and enrolled in the study.

Data collection tool and procedure

On the first visit, all parents attended the dental clinic with their children, only children who met the inclusion criteria

FIG. 2
Participant's flow diagram



were included in the study. All parents signed a consent form after reading the information sheet of the study so that they were aware that they could be asked not to join their children on the second visit based on the order of the allocation in the study. In addition, all participating children reported their anxiety scores on the self-reporting-ACDAS. Any score ≥26 indicated that the child was anxious, so s/he was included in the study. These scores were considered baseline scores. The clinical and radiographical examinations were also completed in the first visit but with no dental treatment.

The time difference between the initial enrolment of the participants on the first visit, and the allocation of children to the study's groups was one week, both steps were completed by the nurse. On the second visit, forty-two children were allocated by the nurse to either the PA (n=42) or PP (n=42) groups based on the sequence of their appointments. Parents in the PA group were asked to wait in the waiting room before the start of the dental treatment, and not to re-join until they were called by the nurse after the completion of the treatment, whereas parents in the PP group were asked to join their children and stay silent during the dental treatment. The treatment of each child in both groups was completed under topical anaesthesia [Benzocaine gel] that stayed in contact with tissue for two minutes, followed by local anaesthesia [lidocaine 2%, buccal infiltration] for one of the carious primary molars, the tooth was restored with a composite restoration under rubber dam isolation. All dental treatments, including the non-pharmacological behaviour management methods [tell-show-do, distraction, and scheduled breaks] were completed by the same dentist, who is a consultant in paediatric dentistry. At the end of the second visit, children in both groups were asked to complete the ACDAS for the second time.

Null hypothesis

The null hypothesis was that there was no significant difference between the Parental Presence (PP) and the Parental Absence (PA) groups in the changing of the children's dental anxiety scores when PPAT was used as an intervention to improve the behaviour of children during the application of dental restorative treatment under local anaesthesia.

Data processing and analysis

The statistical analysis was performed by SPSS 24.0 for Windows (SPSS Inc., Chicago, USA). The mean, standard deviation (SD), and 95% confidence interval (CI) of the mean were used to calculate the numerical variables, whereas percentages were used to calculate the categorical variables. The mean, standard deviation (SD), and 95 % confidence interval (CI) of the mean were evaluated for age.

Two-sample t-tests were used to compare the difference in the mean of the ACDAS between the PA and the PP groups, and to compare the difference in the mean of the ACDAS between boys and girls. The p-value of ≤0.05 indicated statistical significance.

Ethical considerations

This is a single-author study that was ethically approved by the medical education and ethics committee of the hospital. All parents consented to participate after reading the information sheet of the study, and children's verbal assent was obtained from the participants.

Results

There was a normal distribution of the age with 6 years as the minimum age and 9 years as the maximum age and the mean age was 7.5 years ±1.6 years. Boys and girls in the two groups were nearly similarly distributed, 54% of children in the PA were girls, and 50% of children in the PP were girls.

The assessment for eligibility involved 102 children, and 84 met the inclusion criteria. On the second visit, three children were excluded from the PA group, where two mothers changed their minds and refused to stay in the waiting room and the third child was excluded because he needed a pulp treatment. In the PP group, two children who did not attend

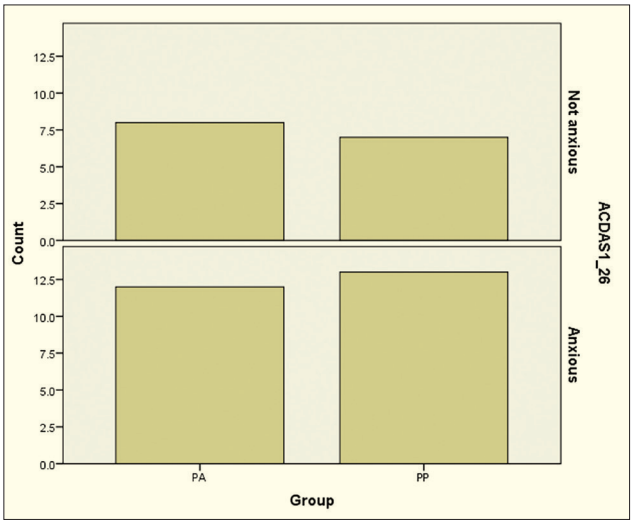


FIG. 3 Dental anxiety scores for PA and PP groups in the first visit

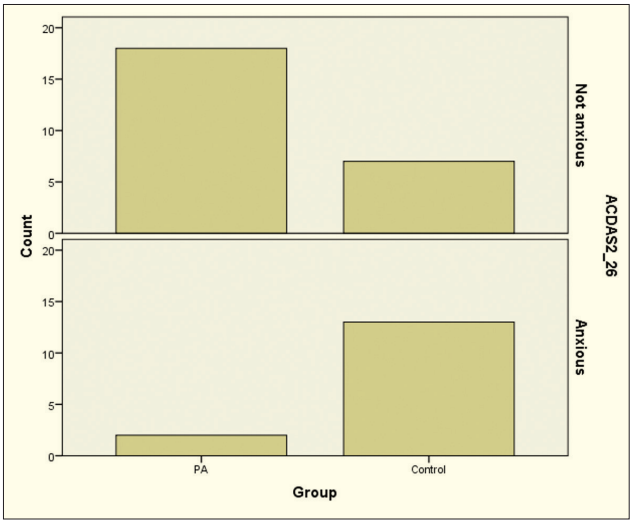


FIG. 4 Dental anxiety scores for PA and PP groups in the second visit

their appointments were excluded. Thus, the final analysed numbers of participants in the PA and the PP groups were 39 and 40 respectively, as shown in Figure 2.

The dental part of the ACDAS (Fig. 1) has a total score that can range between 13 and 39 with a cut-off point of 26 to indicate anxiety. The mean of the ACDAS scores for the PA group was 0.1 and the SD was 0.3. Whereas for the PP group the mean was 0.65 and the SD was 0.48. A significant difference in the mean of ACDAS between the PA and PP groups was found [p< 0.001, and the 95% CI was -0.81 to -0.28]. There was no significant difference in the mean of the ACDAS between boys and girls [p=0.47, and the 95% CI was -0.25 to -0.38].

Discussion

Although Boka et al. [2017] reported no benefit of the PPAT use over other non-pharmacological behaviour management techniques, it suggested that future research should include different treatment conditions as a variable, and the treatment to be completed by a more experienced dentist than postgraduate students, also to apply the PPAT at the start of dental treatment [before local anaesthesia administration]. Therefore, in the current study the PPAT was used before the start of the dental treatment by a consultant paediatric dentist.

The selection of the above age group in this study was based on previous studies that reported that the highest dental anxiety level was found in children in their middle childhood stage [Al-Namankany, 2017; Chen-Yi et al., 2007; Lengua and Kovacs, 2005; Paryab and Hosseinbor, 2013]. Children in the middle childhood stage [6–9-year-old] have a speedy development of mental skills, learn better ways to describe experiences and talk about thoughts and feelings, and demonstrate independence from parents [Lengua & Kovacs 2005].

Because there was no correlation between reporting of anxiety by children themselves and the scores that had been reported by their parents or dentists [Al-Namankany et al., 2012; Vasiliki et al., 2016], a self-reported dental anxiety scale was used in this study as recommended by previous studies [Al-Namankany et al., 2012; Vasiliki et al., 2016].

The ACDAS was used because it contains the essential values to be the gold standard for children's dental anxiety scale [Al-Namankany et al., 2012], and it has been validated in many languages [Al-Namankany et al., 2012; Al-Namankany et al., 2014; Aslan et al., 2021; Mafla et al., 2017]. A score of -26- is a cut-off point on the ROC curve that was used to indicate anxiety as "it gives the optimal results for sensitivity (96%, 95% CI=81.7%~99.9%) and specificity (66%, 95% CI=57.4%~73.8%)" [Al-Namankany et al., 2012].

To minimise the impact of the confounding factors, parents in the PA group were asked to sit in the waiting room before the start of the dental treatment and not rejoin until they were called upon by the nurse at the end of the second visit. Moreover, all dental treatments including the non-pharmacological behaviour management methods [tell-show-do, distraction, and scheduled breaks] were completed by one paediatric consultant dentist. The use of PPAT accompanying the non-pharmacological behaviour management methods was similarly used in an earlier study [Boka et al., 2017].

Although some previous studies did not find a statistically significant difference when using the PPAT, they reported that the PPAT can improve the behaviour of the child during dental treatment [Ahuja et al., 2018] and that anxious parents can have a negative effect on the anxiety level and behaviour of their children [Thribhuvanan et al., 2021; Yigit et al., 2022]. Moreover, a study by Cox et al. [2011] found that children with dental anxiety in the PA group behaved better during the habituation visit (p<0.01), and also during the dental treatment visit than children in the PP group (p<0.05). These previous results were consistent with the result of this study, where a significant difference in the mean of the dental anxiety score between the PA and the PP groups was found [p< 0.001, and the 95% C was -0.81 to -0.28]. There was no significant difference in the mean of the ACDAS between boys and girls [p=0.47, and the 95% CI was -0.25 to -0.38], this result was in agreement with previous studies [Boka et al., 2017; Vasiliki et al., 2016].

In the PP group, 5% of children refused to complete the dental treatment because their parents did not follow the instruction to stay silent. The possibility of the parent interrupting the dental treatment by inappropriate communication such as: saying negative words and comments, or by revealing anxiety themselves could influence the child's cooperation

in completing the dental treatment [The Royal College of Surgeons of England-Faculty of Dental Surgery, 2002]. Dentists are conscious of the disadvantages of the parental presence with anxious children, so they prefer to exclude parents in the favour of a one-to-one relationship with patients as they found the three-way interaction frightening [The Royal College of Surgeons of England-Faculty of Dental Surgery, 2002]. However, involving the parent with children younger than four years of age during the treatment, and outlining their role as an inactive but silent assistant could provide a positive presence without negative interferences [The Royal College of Surgeons of England-Faculty of Dental Surgery, 2002]. Parents usually prefer to stay in the dental clinic with their children [Shroff et al., 2015], so not all interviewed mothers in this study agreed to not join their children during the dental treatment, hence they were not included in this study.

Regarding the limitations of this study, the first lack of a child's previous dental experience assessment could be associated with anxiety and negative behaviours. However, all participating children in this study were anxious. The second was the lack of the effect of other non-pharmacological behaviour management methods on children's behaviour assessment. Although the objective of this study was to assess the effect of the PPAT on the behaviour of anxious children, the assessment of parental anxiety could be considered a useful step in future studies.

Implications for Practice

It is important for any clinician who is dealing with children to understand when to use PPAT effectively, as it seems to have an important role in completing the service that is required.

Conclusions

The use of the PPAT in children aged 6–9-year-old appears to be an effective method to improve children's behaviour when having dental restorations under local anaesthesia.

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Disclosure

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