Review Article
DOI: https://doi.org/10.70749/ijbr.v3i3.905

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://induspublishers.com/IJBR
ISSN: 2960-2793/ 2960-2807

Non-Pharmacological Behavior Management techniques in Pediatric Dentistry: A Narrative Review

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ARTICLE INFO

Keywords

Behavior Management, Pediatric Dentistry, Non-Pharmacological Techniques, Child Patients

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Declaration

Authors' Contribution: All authors equally contributed to the study and approved the final manuscript.
Conflict of Interest: No conflict of interest.
Funding: No funding received by the authors.

Article History

Received: 24-11-2024, Revised: 04-02-2025
Accepted: 01-03-2025, Published: 31-03-2025

ABSTRACT

A proper communication combined with a caring attitude develops sound rapport with any paediatric patient. Non-pharmacological behaviour management techniques enable paediatric dentists to successfully alleviate behavioural problems by matching their selection of techniques to that of the child's style of interaction. On the other hand, few aggressive techniques applied in childhood have been implicated as being prominent factors in the behaviour of developed adult patients with dental phobias. Behaviour management strategies involving non-pharmacological intervention during dental procedures should be considered to attain safe and successful treatment outcomes. This study gives the review of use and the completeness of treatment with these interventions. To mitigate these feelings, it is crucial that the dentist knows and applies behaviour management techniques, adapting them individually to each child and establishing a relationship of trust with both the child patient and their parents or guardians-. This approach aims to minimize fear and anxiety, reducing the chances of behavioural problems, resulting in safe and smooth care.

INTRODUCTION

The specialization of pediatric dentistry provides both primary and comprehensive oral health needs of infants and children, including those with special health care needs(Affairs, 2005). The provision of dental care is needed in preventing and eliminating orofacial disease, restoring the form and functions of dentition, and correcting facial disfiguration. However, pediatric dentists are confronted by difficult challenges brought about by the patient's young ages, their behavior during treatment, or their special medical needs (Dentistry, 2020; Oliver & Manton, 2015).

One of the major problems in pediatric dentistry relates to the management of uncooperative and anxious children during treatment. Dental fear and anxiety (DFA), which indicates strong negative emotions associated with dental treatment among children and adolescents, is the most common cause of behavioral management problems and the non-compliance of children during treatment(Cianetti, Paglia, Gatto, Montedori, & Lupatelli, 2017). The prevalence of DFA in children was reported to be 5–20%(Greenwood & Meechan, 2019). Pain is one of the reasons why a patient may be fearful of dental procedures, which is particularly true for pediatric dental patients(PAC, 2018).

Dental pain is caused by an inflammatory condition, tissue damage, infection, or invasive treatment. Therefore, careful pain assessment and attendant control strategies during dental procedure can promote a better relationship between the dentist and the patient by building mutual trust, relieving fear and anxiety of the patient, and enhancing positive attitudes of the patients toward their future visits(Eskandarian, Eftekharian, & Soleymanzade, 2015). Likewise, the children's medical conditions can cause distinctive challenges in dental treatment, because some medical diseases can influence the timing and the type of dental treatment to be administered, as well as the techniques used in pain and anxiety control(Anthonappa, Ashley, Bonetti, Lombardo, & Riley, 2017).The American Academy of

Pediatric Dentistry (AAPD) had established guidelines on how to conduct a successful dental treatment by reducing pain, fear, and anxiety, to establish a positive attitude toward dental treatment, and to build a trustworthy relationship between the dentist and the patient/parent.

The choice of the technique by a skillful practitioner must be customized after fully understanding the cognitive, social, and emotional qualities of the child(Anthonappa et al., 2017; Dentistry, 2020). The non-pharmacological intervention is divided into two groups: communication and confidence-building and psychotherapeutic strategy. This strategy is based on the concept of learning by changing the unfavorable attitudes of the child in a specific situation, which includes tell-show-do technique, biofeedback, positive reinforcement, hypnosis, distraction, among others.

Non-Pharmacological Behaviour Management Techniques

Paediatric dentistry is currently facing a great challenge with regard to the effective management of child behaviour during the consultation and the perception that parents have of the techniques that can be used, thanks to the significant changes that have occurred over time (Shukla et al., 2021). Uncooperative behaviour of the child may impede the efficient delivery of dental care. Despite the excessive availability of behavioural management techniques, there is a need to search for a psychological behavioural management technique that effectively reduces fear and anxiety during dental treatment (Kohli et al., 2022). The tell-show-do technique is characterized as aiding in the reduction of anxiety in patients, helping to improve their cooperation during their consultation (Kohli et al., 2022). Protective stabilization is defined as the technique used in dentistry to help limit a patient's physical movement during the dental consultation. Currently, parental acceptance of the nitrous oxide sedation technique has changed, and it is the most widely accepted advanced behavioural management technique (Al Zoubi, Schmoeckel, Mustafa Ali, & Splieth, 2021).

Technique	Explanation
Pre-appointment Behaviour modification	Pre-appointment letters, description of what to expect at their appointment
Verbal communication	Child friendly and age-appropriate words, avoiding negative or emotive words.
Non-verbal communication	Child friendly environment, happy and smiling dental team, gentle pats or squeezes to alleviate distress
Voice control	Altering volume, tone and pace as necessary.
Tell-Show-Do	Tell: age-appropriate explanation e.g. slow hand piece as a 'digger'. Show: demonstration e.g. Shown vibrations on finger. Do: without delay
Enhancing control	Hand-signalling/stop signal, or using a traffic light (green, amber, red dependent on level of discomfort).
Positive reinforcement (behaviour shaping)	Selective reinforcement of specific positive behaviours, increasing the probability of repetition of the ideal behaviour e.g. "You are getting a sticker/badge for opening really wide". Negative reinforcement has been shown to be less effective
Modelling	Learning by observing others in real life or video, particularly a positive outcome at the end of the appointment.
Distraction	Shifting attention to something else to assist with more unpleasant procedures e.g. cartoons, audio, asking the child to clench their fist to prevent gagging, or tugging on their lip while administering local anaesthetic
Systematic desensitisation	Relaxation, followed by planned exposure of the patient to fear producing stimuli in a hierarchical order (from least to most fearful), only progressing when they feel able.

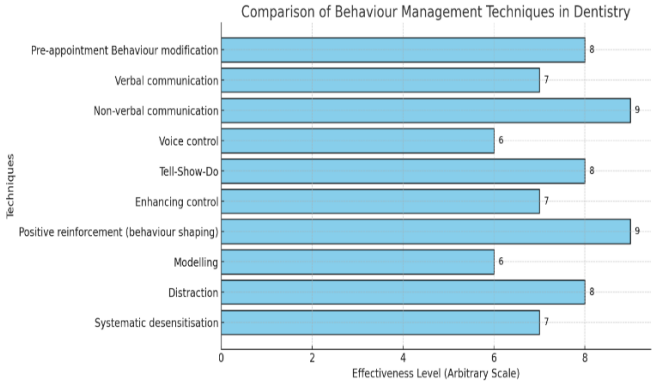
Communication

Communicative management and appropriate use of commands are used universally in paediatric dental patients with both the cooperative and uncooperative child. At the beginning of a dental appointment, asking questions and active/reflective listening can help establish rapport and trust. The dentist may establish relationship to educated patient and deliver quality dental treatment safely (Moriarty, 2015).

Verbal communication: The dentist should aim to establish an empathetic relationship with the patient, and create a non-threatening perception of the dental environment. To achieve this, it is essential that clinicians have a sound knowledge of the child's cognitive processes, and pay attention to their emotions (Bandura, 1969). To develop a trusting relationship with the young patient, the dentist should establish a direct approach by communicating with them in a friendly, calm, and non-judgmental manner, using comprehensible vocabulary and avoiding negative phrases. A two-way communication between child and dentist allows the child to exhibit their skills for coping with a dental visit (Corah, O'Shea, Bissell, Thines, & Mendola, 1988; Marci, Ham, Moran, & Orr, 2007).

Non-verbal communication: Non-verbal communication, such as positive eye contact and friendly facial expressions are essential to achieve an empathetic relationship between child and dentist (Koch, Poulsen, Espelid, & Haubek, 2017).

Figure 1



Tell show do

Introduction of novel instruments and/or procedures can often scare kids with anxiety as they may not be alert of the intended reason of these instruments or procedures. Tell-Show-Do is a fundamental principle used in paediatric dentistry. The behaviour management technique known as "tell-show-do", developed by Adelson in 1959 (Chaves, Carvalho, Ribeiro, & Ribeiro, 2023), maintains its relevance today, being widely used by specialists in paediatric dentistry(Moreira, 2020). This approach comprises a verbal description appropriate to the age group and stage of development of the child patient, a detailed visual, auditory, olfactory and tactile presentation of the entire process to be performed, and practical execution, providing the child patient with familiarity with the dental environment (Roberts, Curzon, Koch, & Martens, 2010).

This technique is one of the most used by professionals to manage behaviour, requiring a previous dialogue and a demonstration of the procedure before its performance, performed by the dentist in his office. This demonstrative approach has been shown to be effective in reducing fear and anxiety in children (Appukuttan, 2016). The technique is particularly effective, as children express interest in observing and interacting with objects present in the dental office (Armfield & Heaton, 2013). In the context of paediatric dental offices, the tell-show-do technique is widely employed to promote behaviour modification using appropriate communication, which represents a significant challenge in dental care (JAIN et al., 2016; MAC GIOLLA PHADRAIG et al., 2023). In addition, this technique has no contraindications, being adaptable for any patient(Mac Giolla Phadraig et al., 2023).

Signaling

This is to allow the patient to communicate with the dental team during any phase of the treatment by means of previously-established signals with specific meanings. The patient, by raising a hand or a finger can communicate their wish to stop the treatment (for rest breaks), or notify the dentist of any unpleasant feelings. The relationship of trust is greatly improved by the clinician responding promptly and appropriately to the young patient's signals(Armfield & Heaton, 2013).

Relaxation training

This intervention requires well-developed learning skills, and therefore, is deemed potentially useful only for older patients. The relaxation techniques are based on the hypothesis that a person cannot be anxious at the same time as they are physically relaxed. These techniques work on muscle tension, joint mobility, or breathing by producing feedback feelings in order to reduce a patient's anxiety level(Milgrom, 1995).

Breathing relaxation

This is a breath conditioning technique (mainly involves engaging the diaphragm muscle), characterised by an increased depth in both inhalation and exhalation, and a reduced breath frequency for an established range of time (e.g. two to four minutes). This type of breathing provides more oxygen to the body, thus reducing the heart rate. Breathing relaxation is easy to perform, and can be adopted by anxious patients in the dental chair immediately before the treatment, or at home (Armfield & Heaton, 2013; Milgrom, 1995).

Hypnosis

The dentist aims to establish a psychological interaction with the patients to reduce their peripheral awareness, by focusing their attention on evoked ideas and images, in order to condition their perceptions, feelings, thoughts, and consequently, their behaviour(Lynn et al., 2015).

Voice control

This technique was suggested by Pinkham (1985). Voice control is a deliberate alteration of voice volume, tone, or pace to influence and direct the patient's behaviour. The objectives of voice control are to gain the patient's attention and compliance; avert negative or avoidance behaviour; and establish appropriate adult-child roles(Singh, Rehman, Kadtane, Dalai, & Jain, 2014; Zhou, Cameron, Forbes, & Humphris, 2011). This approach is often employed in younger children, as they do not respond easily to direct verbal instructions. Therefore, the dentist must speak softly and continuously, as intonation plays a crucial role in capturing the attention of the child patient(Roberts et al., 2010; Zhou et al., 2011). In addition, the facial expression of the paediatric dentist is a crucial factor, conveying confidence to the child patient. In situations of negative behaviour, voice control and facial expression can be employed to re-establish the desired behaviour, redirecting the child's focus and attention from an unpleasant procedure to a more peaceful environment(Shindova & Belcheva, 2014).

Modelling

Introduced by Bandura in 1969; He stated that learning occurs only as a result of direct experience which can be vicarious- witnessing the behaviour and the outcome of

that behaviour for other people. The technique is based on the psychological principle that people learn about their environment by observing others' behaviour, using a model, either live or by video to exhibit appropriate behaviour in the dental environment. This may demonstrate appropriate behaviour via a third party, decrease anxiety by showing a positive outcome to a procedure a child requires themselves, and illustrate the rewards for performing appropriately(Machen & Johnson, 1974; Melamed, Weinstein, Hawes, & Katin-Borland, 1975).

Memory restructuring

Memory restructuring is a behavioural approach in which memories associated with a negative or difficult event (e.g., first dental visit, local anaesthesia, restorative procedure, extraction) are restructured into positive memories using information suggested after the event has taken place. This approach been tested with children who received local anaesthesia at an initial restorative dental visit and has been shown to change local aesthesia-related fears and improve behaviours at subsequent treatment visits.

Restructuring involves four components: (1) visual reminders; (2) positive reinforcement through verbalization; (3) concrete examples to encode sensory details; and (4) sense of accomplishment. The objectives of memory restructuring are to restructure difficult or negative past dental experiences, and improve patient behaviour at subsequent dental visits. It can be used with patients who had a negative or difficult dental visits(Pickrell et al., 2007).

Parental presence/absence

The presence or absence of the parent sometimes can be used to gain cooperation for treatment. A wide diversity exists in practitioner philosophy and parental attitude regarding parents' presence or absence during paediatric dental treatment. The objectives of parental presence/absence are: For parents to: participate in infant examinations and/or treatment; offer very young children physical and psychological support; and observe the reality of their child's treatment. For practitioners to: gain the patient's attention and improve compliance; avert negative or avoidance behaviour; establish appropriate dentist-child roles; enhance effective communication among the dentist, child, and parent; minimize anxiety and achieve a positive dental experience; and facilitate rapid informed consent for changes in treatment or behaviour guidance (Melamed et al., 1975).

Recent advances in behaviour management techniques

Aromatherapy

Aromatherapy based treatment alludes to the medicinal or remedial utilization of essential oils consumed through the skin or olfactory framework. Essential oils, which are extracted from plants, are utilized to regard ailment and also to improve physical and mental prosperity. Despite the fact that the utilization of refined plant materials goes back to medieval Persia, the term "aromatherapy" was first utilized by Rene Maurice Gattefosse in the mid twentieth century. The impact of aromatherapy based treatment on dental anxiety has been assessed in a few studies. Lehrner et al. studied the impact of orange odour and reported enhanced mind-set and less anxiety only in females. Five years after the fact, in another study, they analysed the effect of orange and lavender odour with a music condition and a control condition and exhibited that odours are capable for diminishing anxiety and altering enthusiastic states in dental patient(Lehrner, Marwinski, Lehr, Johren, & Deecke, 2005)

Audio-visual distractions: In the face of remarkable technological advances, there is a growing attraction of children to technological devices, and recent research highlights audio-visual distraction as a modern behaviour control technique(Gujjar, Van Wijk, Kumar, & De Jongh, 2019). One of the forms of this distraction is through a system of glasses that is placed in the child's eyes, allowing them to connect to various devices so that they can choose their favourite animation, aligned with their age group(Cunningham et al., 2021). The personalization of this choice provides the infant patient with a sense of familiarity during the procedure, reducing the chances of uncooperative behaviour (Liu et al., 2019; Silva, Bussadori, Santos, & Rezende, 2021).

A study evaluating clinical anxiety highlighted a significant reduction in anxiety during dental procedures, including during the injection of local anaesthesia, in the group that used audio-visual distraction compared to the group without this technique, indicating the effectiveness of this approach in reducing fear and anxiety in dental care(Silva et al., 2021). Audio-visual glasses have been shown to be more efficient in promoting cooperative behaviour and reducing anxiety, surpassing relaxation techniques such as music or TV in the dental environment(Liu et al., 2019). This is because the child patient diverts his attention to the animation in the audio-visual glasses, avoiding concentrating on the noises of the dental equipment. In addition, this approach enables the child to reduce the perception of pain sensation, relieving their discomfort(Richards, 2019).

Eye moment distraction: Tirupathi S et al. (2019) introduced eye moment distraction technique to manage anxious paediatric patient. In this technique children were asked to close their eyes and perform deep breathing followed by rotation of eyes in alternative clockwise and anti-clockwise directions. The children were instructed to count the number of eye rotations using their fingers. Author found Eye movement distraction as a form of distraction can be used effectively in reducing the anxiety associated dental

invasive procedure(Tirupathi, Krishna, Rajasekhar, & Nuvvula, 2019).

CONCLUSION

The technologies such as audio-visual aids, videogames, mobile apps and virtual reality can be used as an adjunct for conventional techniques due to its immersive, interesting and innovation capability in managing children with behavioural problems and allow dentists to perform effective treatment in a stress-free environment. This study is significant for understanding foundational research, identifying gaps, and advancing knowledge in non-pharmacological behaviour management techniques for paediatric dental care.

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