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RESEARCH ARTICLE

RECENT ADVANCES IN NON-PHARMACOLOGICAL BEHAVIOUR MANAGEMENT TECHNIQUES IN CHILDREN – A REVIEW

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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. The aim of instilling positive reinforcement is achieved by conventional methods but disruptiveness increases with increase in treatment time. Hence, to overcome this disadvantage newer non-threatening techniques were handled by the paediatric dentists, which provide long time reinforcement in younger children. This review will focus on enumerating the recent advances in non-pharmacological behaviour management techniques in children.

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INTRODUCTION

Successful management of the child patient depends on the ability of the dentist to satisfy immediate dental needs which emphasize on enhancing the communication and partnering with the child and parent to promote a positive attitude and good oral health.¹ Behaviour management or child management in the dental office refers to methods of obtaining a child's approval of treatment in the dental chair which is based on proper communication, patient/ parent education with empathy, coaching and listening.² The concept behind guiding a child's behaviour is treating them rather than just operating the tooth alone.³ Wright (1975) defined behaviour management as the means by which the dental health team effectively and efficiently performs treatment for a child patient and at the same time instills a positive dental attitude.² The commonly used non pharmacological behaviour management techniques are Tell-Show-Do, Non verbal communication, Voice control, Modelling, Distraction, Positive reinforcement, Hand Over Mouth Exercise and Protective stabilization.⁴

Even though these conventional techniques are effective in guiding children, the invasiveness involved in some techniques limits the acceptability which in turn leads to the invention of newer non-invasive behaviour management techniques for children. This review article aims in enumerating the recent advances in non-pharmacological behaviour management techniques for children in the dental operatory.

Background: Behavior guidance is the American Academy of Pediatric Dentistry's (AAPD) term describing the interaction between a child, the child's family, and a health care professional in a clinical setting when striving to achieve safe and effective dental education and treatment. Minimizing a child's fear and anxiety is an important factor in providing successful treatment.²⁹ Successful treatment requires that behavior guidance techniques be tailored to each specific child, the family, and the child's dental experience.³⁰ Successful behavior guidance selection and employment can aid achievement of successful dental disease treatment and prevention, thereby creating a positive dental experience for child, parent, and dentist.²⁹ A survey inquiring about the use of 13 different guidance techniques by pediatric dentists indicated they employ a range of techniques.³¹ However, basic behavior guidance techniques, especially communicative ones, tend to

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be the most successful and widely used.³² Many factors contribute to the selection of behavior guidance techniques. One panel report suggests that postdoctoral students should receive training, with regard to behavior guidance selection, in family dynamics and advocacy, parenting, and multiculturalism among other things.³³ Another report states more simply that the “appropriateness” of a behavior guidance technique is based on effectiveness and social validity.³⁰

Medical sociologists suggest a shift in the health care industry toward a consumerist approach leading to dental treatment increasingly becoming a decision-making process between dentist, parent (and potentially other family members), and insurer. Multicultural influence on health beliefs, in addition to societal changes in parenting, reflect complications that dentists face when deciding treatment approaches for children.³⁴ All of these complex factors must be considered when treating a child in the dental setting and how a management plan will be accepted.

Parental acceptance of behavior guidance techniques is an important part of successful dental treatment of pediatric patients as well as for any other specialty that may benefit from the use of these techniques. Multiple studies have investigated what guidance techniques are accepted by parents for their children, and what factors determine parental attitudes. These studies have shown highly variable results ranging from all presented behavior guidance techniques having some degree of parental acceptance³⁵ to no technique having universal acceptance.^{36,37} The data also suggest a definite continuum of parental acceptance where the least aggressive, communicative guidance techniques are most accepted, while more aggressive techniques involving restraint or pharmacologic intervention are rated less acceptable.³⁶

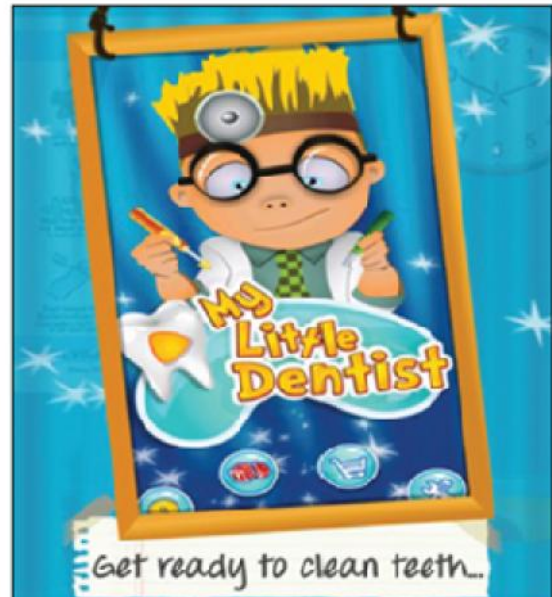
Behaviour guidance is a comprehensive, continuous technique employed to initiate and nurture the child-dentist relationship. It aims to establish better communication, alleviate fear and anxiety, deliver quality dental care, build a trusting relationship between dentist and child and to instill a positive dental attitude towards oral/dental health and oral health care (AAPD Reference Manual, 2011). The outcome of these techniques could maintain a proper communication or extinguish disruptive behaviour related to dental treatment. It could be a combination of behaviour guidance approach individualized for the child. The behaviour guidance techniques should enhance the communication in both cooperative and uncooperative children. Recently technologies were combined with the behaviour guidance to improve the communication and enhance positive dental attitude in a stress-free way.⁵

Recent behaviour management techniques

Tell- Play- Do: The commonly used behavior guidance technique namely Tell- Show-Do was modified by Vishwakarma AP as Tell-Play-Do in 2017 for children aged 5-7 years. The technique was similar to Tell-Show-Do but an additional component of allowing the child to play with dental equipments was carried in Tell-Play-Do. As per the learning theory of Bandura, the child’s anxiety towards the dental equipments reduces, thereby feels more comfortable and develops cooperative behavior.⁶ Since only one study has been reported in literature, further research is recommended to assess its effectiveness in the dental set-up.



Mobile dental app: Mobile dental applications can be used for reducing fear and anxiety in children in the dental set up. An interactive session of using the dental application during the treatment was allowed and the children were virtually made dentists and allowed to provide different treatments through the application.⁷ By this technique, the fear towards different dental instruments and its use in children could be reduced and more cooperative behaviour could be achieved. Mobile dental application could be used as an adjunct behaviour management technique however further research is needed.



Audiovisual distraction: Audiovisual distraction involves the concept of imagery and distraction delivered via audiovisual aids, thereby removing the focus on the dental procedures, avoiding anxiety provoking stimuli and providing a relaxing experience throughout the procedure.⁸

The goals of audiovisual distraction are imagination (helps in distracting children from present situation), engagement (enables children's attention to focus on a single thing) and motivation (helps children to encourage getting treated for dental problems in future).⁹

Management of dental anxiety: Audiovisual distraction is effective in controlling dental anxiety in children.¹⁰ Videotaped cartoons, showing children in the dental clinic or any other type of cartoon can be displayed to the patient for reducing anxiety in children aged 7-9 years during restorative procedure.¹¹ When a comparison study was done in children to compare audio and audiovisual distraction for reducing anxiety in children during their first dental visit, it was found that audiovisual distraction reduced anxiety in anxious dental patients.¹²



Management of pain:

-) Audiovisual distraction could also reduce the intensity of pain during painful procedures, such as puncture procedures like administration of Local anesthetics.⁹
-) Three dimensional audiovisual distraction has also been shown to reduce anxiety during local anaesthesia administration.¹³
-) A modification to the audiovisual distraction technique was done by adding an eyewear which distracted the child from the environment and to reduce dental anxiety

in children during treatments such as computerized delivery of anesthesia.⁸

Thus, Audiovisual distraction could be an effective method for managing dental anxiety and pain related to dental procedures.

Videogame distraction: Even though there are a wide range of behaviour management techniques available for managing highly anxious children, it was impossible to divert the child's attention during pain perception in invasive procedures.¹⁵ The use of videogame as a distraction tool is based on the principles of cognitive-behavioural therapy and neurofeedback mechanism for children with anxiety disorders.¹⁵ Videogames are interesting and commonly available media, which can help in implementing distraction in children by active participation of the child during the dental procedure.¹⁶

For health promotion: Oral health education related videogames are used and can be given to children for promoting healthy diet and good oral hygiene in high caries risk children.¹⁷

Management of dental anxiety: Ipadswere used for reducing anxiety in children during their orthopaedic visits showed good and positive results in the study population.¹⁸ Videogames were also, affectively used to reduce pain perception during cold-pressor trials.^{19,20} Videogames could be an effective distractor and improve oral health related outcomes, however extensive studies in its applicability in the field of pediatric dentistry is required.

Virtual reality based distraction: In 1968, Ivan Sutherland and Bob Sproull invented virtual reality with a head mounted device that was connected to a computer. Later in 1998, Heim described virtual reality as an interactive computer based software that can be used to immerse children in the virtual environment which completely obstructs the present situation.²¹ The Virtual Reality equipment contains head mounted display and a tracking device. The head mounted device contains the display screen which provides the view of virtual reality environment in a 360° view. The tracking device monitors the head movements. The equipment provides an attachment for mouse, joystick or dataglove for playing games.²²

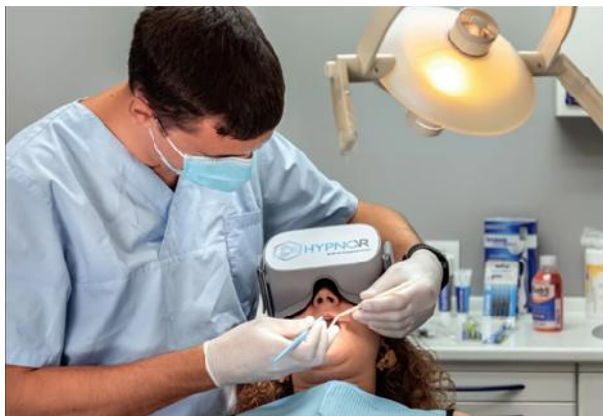


Uses of Virtual reality

For distraction: The virtual reality environment has abilities to withdraw attention of the child from the thoughts that are

associated with the treatment and provide interactive distraction in a virtual environment. Virtual reality distraction also showed good results when was used and studied for reducing anxiety towards previous dental experiences in children.²³ Comparison between videogame and virtual reality with and without head mounted display and found virtual reality with head mounted display, showed that the apparatus could reduce pain tolerance during cold pressor trials.²⁴ Factors that influence the distraction using virtual reality device are the level of interest shown by the child and the level of immersion of the child into the virtual world.

Minor procedures: Researchers used virtual reality environment for children undergoing invasive procedures requiring administration of anaesthesia and found there was an improvement in subjective pain tolerance to injections, anxiety and behaviour stress reduction levels in children and parents. Certain studies have shown that virtual reality reduces pain perception in children by reducing pain related brain activity.²⁵ Studies have also concluded that virtual reality could reduce the intensity of pain in patients with chronic illness.^{26,27,28} The pain perception in children while using virtual reality was relatively low compared to conventional behaviour management techniques.



Contraindications of Virtual Reality

-)] Medically compromised children especially children with epilepsy, migraine and vestibular disturbances.
-)] Children with previous history of nausea or dizziness following the use of Virtual Reality device.²²

Virtual reality technology, an emerging field in the management of pain and anxiety could be used in dental operator and clinical studies were indicated to solidify the effect of VR in dental situations.

Conclusion

The recent technologies such as audiovisual aids, videogames, mobile apps and virtual reality can be used as an adjunct for conventional techniques due to its immersive, interesting and innovational capability in managing children with behavioural problems and allow dentists to perform effective treatment in a stress-free environment.

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