



Original Research

Audio distraction technique in management of anxious pediatric dental patients

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Abstract

Background

Dental anxiety results in undesirable effects like turning away of dental treatment and increase stress among doctors that consequently have an effect on the treatment quality. The aim of this study was to evaluate the effectiveness of listening to music using headphones as an audio distraction technique on behavior and anxiety management in children receiving dental treatment.

Materials and Method

The present interventional prospective study comprised of 60 subjects within the age group of 6-12 who were advised for dental procedures. The patients were selected from the outpatient department and grouped randomly into group A and group B with 30 subjects in each group. The group A comprised of 30 pediatric patients who were given audio distraction aids. In the group B, the treatment procedure were carried out without any distraction aids. The anxiety level was measured before and after the treatment for both the study and control group using Wong Baker's anxiety rating scale and statistical analysis were made.

Result

Intragroup comparison showed highly significant difference in anxiety levels after the treatment. Intragroup comparison showed significant decrease of anxiety level from preoperative and post operative in both groups, but it was more significant in study group. The statistical analysis showed significant decrease in anxiety level after the treatment in study group than in control group.

Conclusion

Audio distraction technique proved to distract and reduce anxiety during dental procedures in pediatric patients.

Keywords: *Pediatric patients; Anxiety; White noise; Head Phones; Wong baker's anxiety rating scale; Distraction;*

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INTRODUCTION

Dental anxiety among pediatric patients is a great challenge faced by every dentist in everyday dental practice. The child's uncooperative behavior may restrain the effective delivery of dental care which in turn may compromise the quality of treatment provided^[1,2]. Behavior management techniques are meant to reduce the need for excessive and unsafe use of medications. Dentists have a wide variety of techniques available to them to assist in management of child with anxiety^[3], such as tell-show-do, relaxation, distraction, systemic desensitization, modeling, audio analgesia, hypnosis and behavioral rehearsal^[4]. Among this, traditional management such as papoose board and hand over mouth technique can be successful. Management of children in the dental clinic is complex balancing act involving the child, parent and the dentist. To provide dental care for children good communication skills are necessary. A considerable percentage of children do not co-operate in the dental chair, causing an obstruction to delivery of quality dental care. This gives rise to behavior management techniques or alternatives to communicative management.

Behavior management of the child patient is an intrinsic component of pediatric dental practice. Parents and care takers also play an important part in reducing the child's anxiety, allowing the dentist to perform the treatment and manage them^[5,6]. Now no aversive techniques such as distraction are more popular. The success of distraction technique in medical setting and in adult patients is well organized, but literature reports limited data to assess the efficacy of distraction methodology in pediatric dental patients^[1]. Hence the aim of this study was to evaluate the effectiveness of listening to music using headphones as an audio distraction technique on behavior and anxiety management in children receiving dental treatment.

MATERIALS AND METHODS

Study population

The present interventional prospective study comprised of 60 subjects within the age group of 6-12 years selected from the outpatient department of Dr Hegdewar Smruti Rugna Seva Mandals Dental College and Hospital and grouped randomly into group A as study group and group B as control group with 30 subjects in each group.

Inclusion criteria

- No previous dental treatment experience.
- No systemic disease.
- No learning disability.

Exclusion criteria

- Uncooperative patients.
- Children with any mental and physical disability.
- Children with any trauma.

Materials

- Wong baker's anxiety rating scale
- Headphones
- MP3 player

Method

The study was approved by the ethical committee of Dr Hegdewar Smruti Rugna Seva Mandals Dental College and Hospital [IRB/FAC/2021-135/PEDO] and informed consent was obtained from the patients and their parents/guardians before the commencement of the study. The study group A comprised of 30 pediatric patients who were given audio distraction aids i.e. Headphones with white noise a few minutes before the commencement of treatment. In the control group B, the treatment procedure was carried out without any distraction aids.

The volume of the music was maintained at 75 db to reduce the audible sound of hand piece to the patient. Whenever there was a need to communicate with the patient the volume was reduced. The anxiety score was measured before and after the treatment using Wong Baker's anxiety rating scale. Statistical analysis was made

with unpaired t-test for intergroup comparison of anxiety scores and paired t-test for intragroup comparison of anxiety scores.

RESULT

Table 1 shows the mean scores, standard deviation and mean difference of pre-operative and post-operative anxiety levels between the groups (Unpaired t test), whereas Table 2 shows within the groups (Paired t test). There was no much difference in distribution of subjects (based on anxiety levels) in study and control group ($p > 0.05$).

Intergroup comparison showed highly significant difference in anxiety levels after the treatment (Table 1).

Intragroup comparison showed significant decrease of anxiety level from pre-operative and post-operative in both control and study group but it was more significant in study group (Table 2).

The statistical analysis showed significant decrease in anxiety level after the treatment in interventional group than in control group (Fig 1, Fig 2).

Table 1: Inter group comparison of anxiety score

Group	N	Mean	Std. Deviation	Mean diff	t value	p value
Pre-op Study group	30	7.2667	1.77984	.66667	1.495	.140
Pre-op Control group	30	6.6000	1.67332			
Post-op Study group	30	3.7667	1.47819	-2.36667	-5.841	** .000
Post-op Control group	30	6.1333	1.65536			

** - Highly significant

Table 2: Intra group comparison of anxiety score

Group	N	Mean	Std. Deviation	Mean diff	t value	p value
Study group Pre-op	30	7.267	1.780	3.500	8.69	* < 0.001
Study group Post-op	30	3.767	1.478			
Control group Pre-op	30	6.600	1.673	.466	2.97	* 0.006
Control group Post-op	30	6.133	1.655			

* - significant

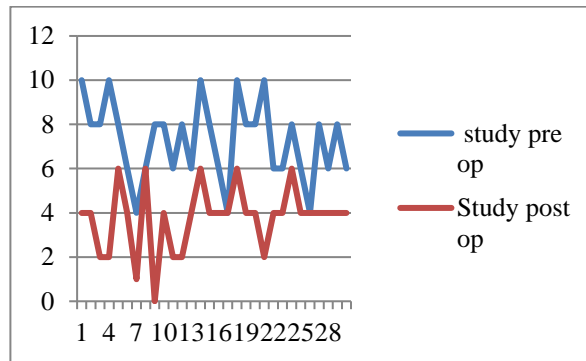


Fig.1: Anxiety score using audio distraction technique measured by Wong Baker's anxiety scale before and after the treatment

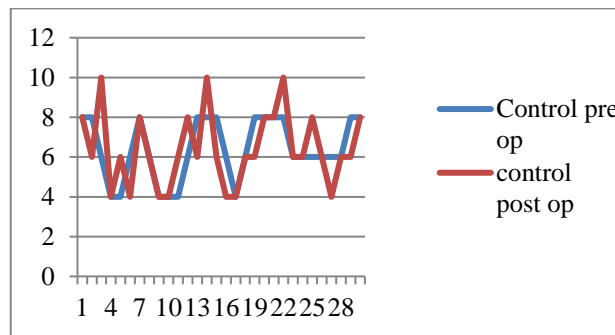


Fig.2: Anxiety score without using audio distraction technique measured by Wong Baker's anxiety scale before and after the treatment

DISCUSSION

Dental fear of the patients is one of the most common reasons to delay or avoid dental visits. Number of fearful people regularly cancel or fail to visit dentists. Patients with high dental fear, both children and adults, may prove difficult to treat. They require more time, and their behavioral problems which can result in a stressful and unpleasant experience for both the patient and the treating dental practitioner. If patients are not managed appropriately, it is more likely possible to establish what has been referred to as a 'vicious cycle of dental fear'^[6].

There are various pharmacological and non-pharmacological approaches in helping patients cope with dental anxiety. A caring and patient-centered approach in combination with various behavioral and psychological approaches play a vital role. This will yield superior short-term results as well as better long-term patient retention than the use of pharmacological methods.

Few non-pharmacological methods used for anxiety management includes, tell-show-do, rest breaks, signaling, positive reinforcement, diaphragmatic breathing, progressive muscle relaxation, cognitive restructuring, hypnosis^[7]. These techniques have been in practice for many years and recent advancement in introduction of new distraction techniques includes music distraction and visual distraction techniques. A very few studies have been undertaken to evaluate the efficacy of distraction technique used for treating pediatric patients. Audio analgesia is one among the non-pharmacological distraction technique used to treat pediatric patients. In this study we have used white noise to reduce the pain and anxiety level of the pediatric patient. Objective measurement was done

using Wong Baker's anxiety rating scale. The study results showed the effectiveness of using white noise in distraction and reducing anxiety in pediatric dental patients. The study result demonstrated that the anxiety levels were significantly reduced both with and without use of audio distraction. Interestingly, the use of audio distraction had reduced anxiety level when compared with no usage.

White noise is a mixture of sounds of various frequencies [8]. It is also believed that White noise helps to increase the concentration and improve memory. This white noise of various frequencies has effect on mesolimbic midbrain, and this region of brain corresponds to the dopamine pathway [9]. Thus, white noise was reported to reduce anxiety [9-10]. Moreover, the volume was kept at 75 decibel which was at 3/4 of the volume in the MP3 device which helped to decrease unpleasant noise created by dental hand piece or other anxiety inducing stimuli. Naithani et al evaluated audio- visual distraction in the managing anxious pediatric dental patients and reported an obvious decrease in anxiety scores [9]. Jindal et al also found that audio distraction aids decreased level of anxiety in pediatric patients [10]. Most children experience anxiety purely on the basis of psychological, social and environmental influences. Parents face special challenges because children with anxiety tend to be nervous, avoidant, annoying or exhausting [11-16]. Ram et al reported that, audiovisual distraction technique provide as an effective distraction tool for the management of unpleasant behavior and distress that arises during dental procedures [17]. Singh et al reported that decrease the anxiety in pediatric patients to a significant extent, moreover patients had an overwhelming response to music presentations and wanted to hear them in their subsequent visits [18]. Prabhakar et al from his study conferred that, music reduced anxiety to some extent but not very significant, and stated that music distraction may be helpful as an adjunct along with other techniques therefore further research needs to be done in this field using other non- aversive techniques and newer strategies should be devised to manage anxious pediatric dental patient [3]. Behavioral management of pediatric patients during dental treatment is most commonly used by almost all the dentists in which distraction technique plays a crucial role [19-22]. Non-pharmacological methods of behavior management, particularly with difficult children proved to be more effective in reducing the complications caused due to anxiety [23-24].

However further research is required with greater sample size, involving different age group, giving choice of audio to the subjects and efficacy of other distraction methods such as visual and audio-visual techniques.

CONCLUSION

Within the limitations of this study, it was found that the anxiety level of pediatric dental patients reduced with and without the usage of audio distraction after the treatment. Reduction in anxiety level with audio distraction proved more beneficial. Thus, it was concluded that managing pediatric patients with audio distraction aids especially white noise was an effective method for comfortable handling of anxious patients in dental clinic. Furthermore, research can be conducted with more invasive procedures to evaluate other better techniques in management of pediatric dental patients.

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Conflicts of interest - There are no conflicts of interest

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