

Effect of audio and audio-visual distraction aids in reducing anxiety during pedodontic care

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Abstract:

The use of audio-visual and audio distraction tools can lead to the improvement of the quality of treatment and benefit both the dentist and the patient. It is of interest to evaluate the anxiety levels using audio and audio-visual distraction aids during pedodontic care. We collected data on 30 children between 6 to 12 years old. Subjects were randomly assigned into three groups of ten each. The three groups were control group, audio distraction group and audio-visual distraction group. The pulse rate of all the patients were assessed, Venham's picture test and Venham's Clinical Rating scale was recorded for all the subjects during the first and second visits. A statistically significant ($p < 0.01$) difference in pulse rates was observed when audio and audio-visual groups were used during treatment. This implies that distraction aids help to reduce the levels of anxiety pedodontic care.

Keywords: Children; Dental Anxiety; Pulse rate; Restorative procedures.

Background:

Dental anxiety is a widespread problem among children and adults that can lead to conscious avoidance of dental treatment, which in turn has an adverse effect on the patient's dental, psychological and overall health [1]. Cognitive behavioural treatment is the best way to maximize treatment gains is by attempting to reduce anxiety in

children [2]. Children below 4 years' experience separation anxiety which make the operator to resort to treatment modalities involving the presence of the parent [3]. From the age of 6-7 years psychological and emotional development occurs, there is a development of trust and autonomy from this stage onwards a child may or may not be cooperative based on their pattern of

psychological growth [4]. There is a huge spectrum of behaviour guidance techniques to meet the needs of the individual child as children exhibit a broad range of physical, emotional, intellectual and social development and a diversity of attitudes and temperament [5]. Basic behavioural technique is based on the communication skills of the dentist and it includes the specific techniques of pre-visit imagery, direct observation, tell-show-do, ask-tell-ask, voice control, nonverbal communication, positive reinforcement, distraction, and memory restructuring [6]. The advanced behaviour guidance techniques include protective stabilization, sedation, and general anaesthesia [7]. Therefore, it is of interest to evaluate the anxiety levels using audio and audio-visual distraction aids during pedodontic care.

Materials and method:

Dataset:

The present study was conducted in the outpatient department of a private institutional hospital in Chennai. It is a comparative interventional study undertaken to compare the effectiveness of various audio distraction aids in reducing anxiety in the dental paediatric patients. The Institutional ethical board approved the study protocol. The study was carried out in a total number of 30

children, aged between 6 to 12 years, and were selected among the patients who came for their first dental evaluation.

Analysis:

Patients were randomly assigned into three groups of ten each. The three groups were control group, audio distraction group and audio-visual distraction group. The sample size was determined based on a study by Kaur *et al.* [8], which was similar to our study. The child's medical and dental history was taken and an informed consent was obtained from the parents. The criteria for the children included in the study included children with no previous dental experience & hospitalization. No mental disability, not having experienced any harmful events (severe accidents, eye witnessing a crime etc), Absence of any systemic disease. Patients with pain, swelling and any other emergency procedures were excluded from the study. The pulse rate of all the patients were assessed [9] Venham's picture test [10] and Venham's Clinical Rating scale [11] was recorded for all the patients during the first and second visits during the procedure. During the first visit the patient was familiarised with the dental setup and preventive procedures were performed if required. During the second visit only restorative procedures were carried on. A tukey HSD *post-hoc* test was done to perform multiple comparisons among control, audio distraction and audio-visual distraction groups.

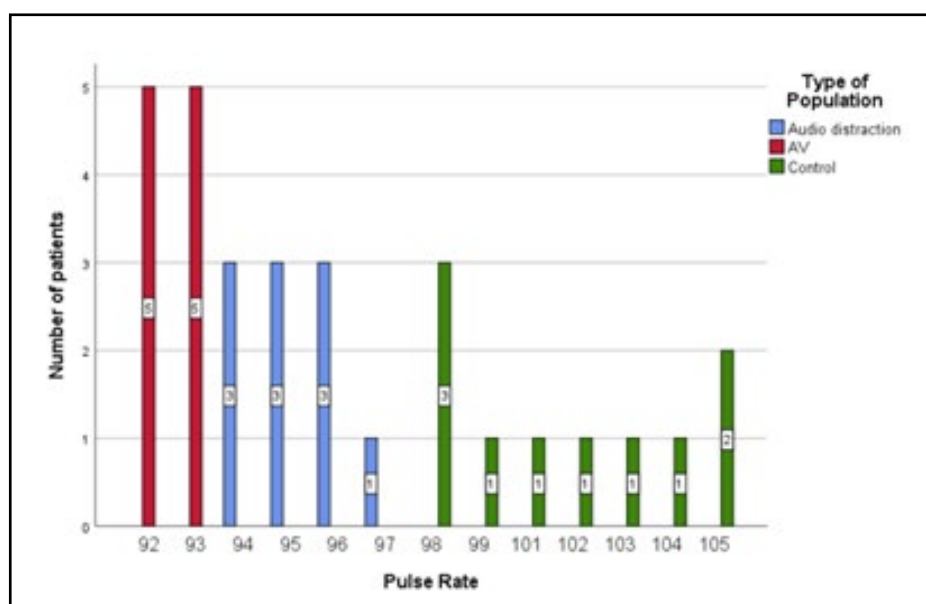


Figure 1: Mean pulse rate in all the 3 groups. Audio visual distraction (red); audio distraction (blue); control group (green). X axis represents the pulse rate and Y axis represents the number of patients. Data shows that pulse rates are higher than the control group.

Table 1: The mean pulse rates in the first and second visits are shown. Inter-group comparison of control, audio distraction group and audio visual distraction group using Tukey HSD post-hoc test are shown.

Mean			Tukey HSD post-hoc test				
VISIT	Group (n=10)	Mean pulse rate	(I) Treatment	(J) Treatment	Mean difference (I-J)	Std. Error	Significance (p)
First visit	Control	101.30	Control	Audio	6.100*	0.808	<0.001
				AV	8.800*	0.808	<0.001
	Audio	95.20	Audio	Control	-6.100*	0.808	<0.001
				AV	2.700*	0.808	0.007
	Audio-visual	92.50	Audio-visual	Control	-8.800*	0.808	<0.001
				Audio	-2.700*	0.808	0.007
Second Visit	Control	102.10	Control	Audio	8.000*	0.526	<0.001
				AV	9.900*	0.526	<0.001
	Audio	94.10	Audio	Control	-8.000*	0.526	<0.001
				AV	1.900*	0.526	0.003
	Audio-visual	92.20	Audio-visual	Control	-9.900*	0.526	<0.001
				Audio	-1.900*	0.526	0.003

n= Number of patients per subgroup= 10, *Represent the mean difference is significant at the 0.05 level, SE= Standard error, HSD= Honest significant difference.

Results and Discussion:

Out of the 30 participants, there were equal percentages of male and female participants. Majority of the patients (26.67%) were 9 year old, followed by 7-year-old patients (20.0%), followed by 6 and 12-year-old patients (13.33%), followed by 8 and 11-year-old patients (10.0%), followed by 10-year-old patients (6.67%). During the first visit and second visit, there was a statistically significant difference of pulse rate values between the control group and the audio and audio-visual distraction groups. The most significant change in pulse rate was seen when the control group ($p < 0.001$) was compared to audio distraction and audio-visual distraction groups. There was a statistically significant ($p < 0.01$) difference in pulse rates when audio and audio-visual groups were compared as well. This indicates that the distraction aids reduced the levels of anxiety when the children were being treated when compared to

the control groups (Table 1) (Figure 1). This is in accordance with the studies by Florella *et al.* 2010 [12] and Kaur *et al.* (2015) [13].

The frequencies of the Venham's picture test scores in the picture test has been derived using SPSS and it was seen that children in the control group have chosen a more anxious figure multiple times when compared to the groups where audio or audio-visual distraction aids were used. No statistically significant results could be obtained for the same, which is similar to the observations made, by Venham *et al.* [14], Alwin *et al.* [15] and Prabhakar *et al.* [16]. Venham's clinical anxiety scale is a subjective scale that measures the situational anxiety of the child by the clinician. It is an interval rating scale in which produces a reliable, valid scale, which can be easily integrated in clinical, or research activities. It is a six-point scale, with zero being relaxed and five requiring physical restraint [14]. From our observations we did not arrive at a statistically

significant result which is similar to the findings Venham *et al.* 1977 [14]. Dental anxiety is a significant issue which is reported in many countries and it varies from population to population with the least being 3% to a maximum of 43% [17]. There are a few psychological theories that explain anxiety, which includes: psychoanalytic and psychodynamic theory, behavioural theories, and cognitive theories. Psychodynamic theories focus on symptoms as an expression of underlying unresolved conflicts [18]. Anxiety is considered as a normal phenomenon in children, which begins at seven to nine months of life [19]. Several neurotransmitter systems have been implicated to have a role in one or several of the modulatory steps involved and the most commonly associated neurotransmitter systems are the serotonergic and noradrenergic neurotransmitter systems [20]. Future studies including a larger sample size, using various parameters to test anxiety and different distraction aids could be carried out to add more evidence to the existing literature.

Conclusion:

We show that audio and audio-visual distraction aids help reduce anxiety during pedodontic care.

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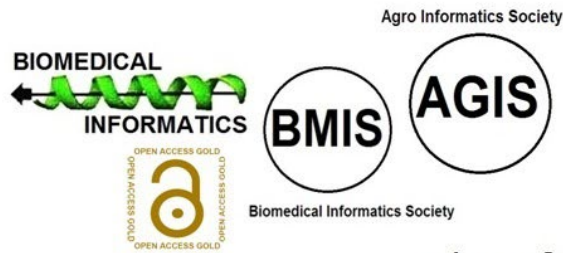
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