A Comparison between Audiovisual and Audio Distraction Techniques in Managing Pediatric Dental Patients

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ABSTRACT :
Introduction:
Managing children's anxiety during dental visits is crucial. This study compared the effectiveness of audiovisual distraction (TV), audio distraction (headphones), and a standard dental setting for managing anxiety in children aged 4-8 during their first dental appointment.
Materials and Methods:
Sixty children were divided into three groups: control (standard setting), audio distraction (headphones), and audiovisual distraction (TV). Anxiety levels were measured using Venham's picture test, anxiety evaluation, pulse rate, and oxygen saturation. All groups received four dental visits with various procedures.
Results:
The audiovisual distraction group showed significantly lower anxiety compared to the other groups, particularly during extractions. Children preferred the music presentation.
Conclusion:
Audiovisual distraction is more effective than audio distraction or a standard setting in managing anxiety in young children during dental procedures.
KEYWORDS: modelling ,distraction,analgesia

Introduction

Every dentist who treats kids has to deal with a scared child on his or her first dental appointment. It is not surprising that the child might be nervous given the grandeur of dental technology and the novelty of the encounter. In order to help a child with anxiety become a cooperative patient, a dentist's duty is twofold: first, they must manage and treat the issue the child is reporting, and second, they must teach the child healthy coping mechanisms for their

worry. Numerous strategies, including tell-show-do, relaxation, diversion, systematic desensitization, modeling, audio analgesia, hypnosis, and behavior rehearsal, are available to dentists to help manage children with anxiety . Although traditional behavior management methods like the hand-over-mouth technique and the papoose board can be effective, parents' and dentists' attitudes toward these methods are shifting (1)(1,2), and nonaversive methods like distraction are now gaining traction.

Anxiety is a tense mental state related to a disease that is expected or imminent. A state of apprehension regarding dental care is known as dental anxiety. In dentistry, a variety of techniques have been employed to lessen patient anxiety. One of them is distraction.The goal of distraction is to redirect the patient's focus from a process that they may find unpleasant (AAPD 2016). By highlighting the fact that people's attention spans are restricted, Mc Caul and Mallet created the notion of distraction. They noted that in order to experience pain, a person must focus on the unpleasant stimuli; hence, when a person's focus is diverted from the stimulus, their feeling of pain diminishes (1).

There are two types of distractions: active and passive. One way to passively block out hearing and vision is through audiovisual distraction. On the other hand, playing a game is an intentional strategy that diverts attention from kinesthetic feeling, another form of sensation. Children frequently use their mobile phones to play video games and watch videos. Dentists can use these to divert the attention of young patients. There aren't many studies on how cognitive distraction affects dental operations.

Thus, the purpose of this study was to examine how children's anxiety during local anesthesia injection during extraction and pediatric dentists' and children's satisfaction with patient behavior during treatment were affected by distraction from mobile phone video games versus video viewing.

Materials and method

60 kids, ages 4 to 8, who had never seen a dentist before, were chosen from among those who were there for their first appointment. Along with a brief medical and dental history, the patient's parents gave their consent on the initial visit.

Three groups of twenty children each were formed. The first group was the control group , which received therapy in a typical dental setting. Group B, the second group, wore headphones to listen to an audio presentation during the period of the treatment . A television-based audiovisual presentation was shown to the third group (group C) for the duration of the therapy. Each child had four visits to the dentist: the first was for screening, and the remainder three were for treatment. During these visits, patients received a variety of treatments, including oral

prophylaxis in the second visit, cavity preparation and restoration in the third, and extraction following local anesthesia in the fourth or final visit.

Venham's picture test, Venham's evaluation of clinical anxiety, pulse rate, and oxygen saturation, which were monitored with a pulse oximeter (Biosys BPM 200), were the four measurements used to determine the child's anxiety level at each visit.
After being tallied, the values were statistically analyzed.

RESULTS:

VISIT	**ANXIETY SCALE (MEAN ±SD)**	**PULSE RATE (MEAN ±SD)**	**OXYGEN SATURATION (MEAN ±SD)**
Screening	1.2 ± 0.8	101.0 ± 7.0	97.7± 0.8
Prophylaxis	0.8± 0.5	99.0 ±3.3	97.9 ± 0.5
Restoration	0.8±0.5	106.8 ±7.1	97.8± 0.8
Extraction	1.2±0.9	114.9 ±10.3	97.1± 1.0

Table : 1 control group A
A comparison between audio and audiovisual distraction techniques in managing anxious pediatric dental patients

VISIT	**ANXIETY SCALE (MEAN ±SD)**	**PULSE RATE (MEAN ±SD)**	**OXYGEN SATURATION (MEAN ±SD)**
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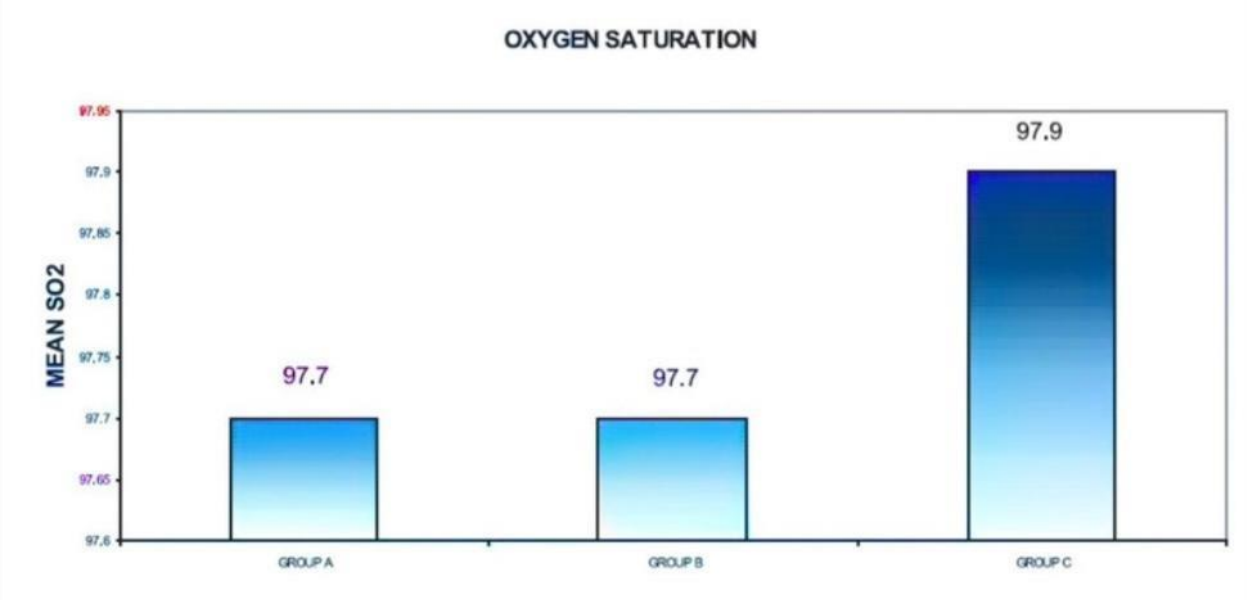
Extraction	1.2±0.9	114.9 ±10.3	97.1± 1.0

TABLE:2 Audio distraction group (Group B)
A comparison between audio and audiovisual distraction techniques in managing anxious pediatric dental patients

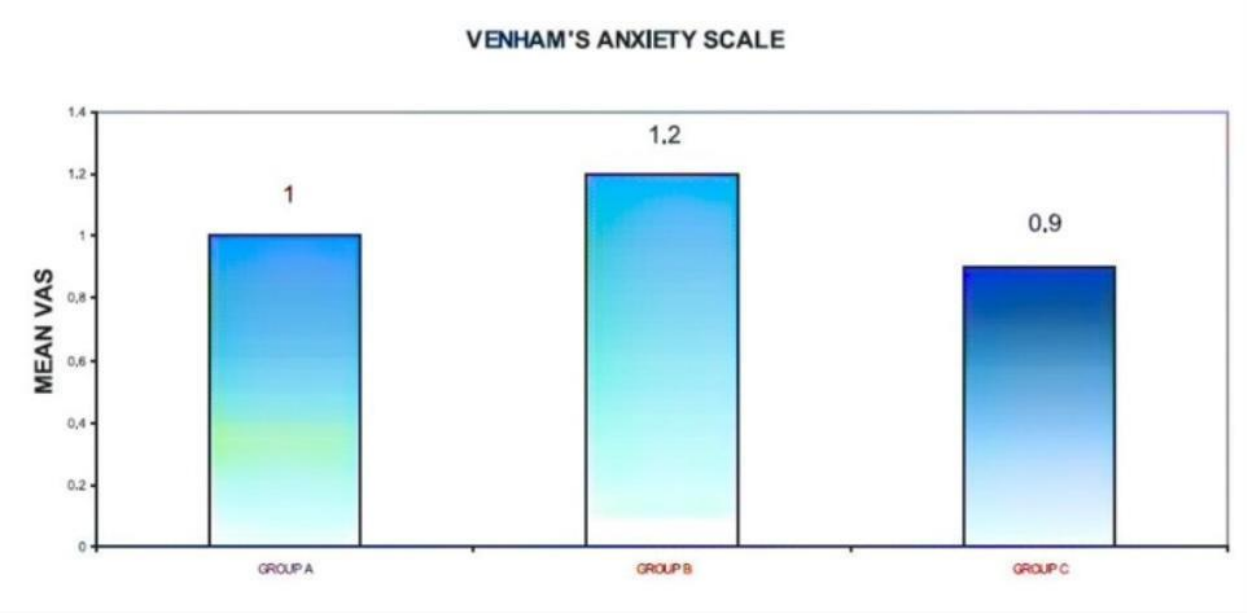
VISIT	ANXIETY SCALE (MEAN ±SD)	PULSE RATE (MEAN ±SD)	OXYGEN SATURATION (MEAN ±SD)
Screening	1.0 ± 0.8	96.3 ± 4.2	97.8± 1.7
Prophylaxis	0.7± 0.5	97.7± **2.7**	98.3 ± 0.6
Restoration	0.8±0.6	98.0 ± 0.6	98.1± 0.6
Extraction	1.8±0.7	101.2 ±3.0	97.6± 0.7

TABLE:3 Audiovisual distraction group (Group C)
A comparison between audio and audiovisual distraction techniques in managing anxious pediatric dental patients



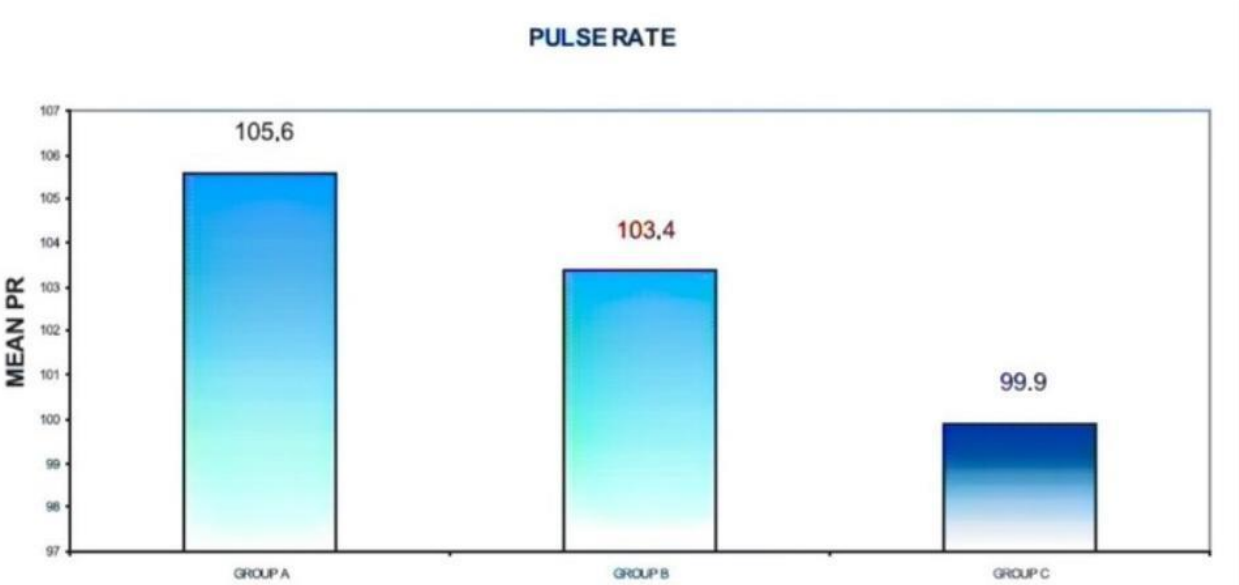
GRAPH 1: Comparison of oxygen saturation between groups

An analysis of the differences between audiovisual and audio distraction strategies for treating nervous young dental patients



GRAPH 2: Comparison of Venham's anxiety scale scores among groups

An analysis of the differences between audiovisual and audio distraction strategies for treating nervous young dental patients



GRAPH 3:Comparison of pulse rate between groups

An analysis of the differences between audiovisual and audio distraction strategies for treating nervous young dental patients

DISCUSSION

A prevalent issue that primarily manifests in childhood and adolescence is dental anxiety . A child's dental anxiety can take many different forms. While some kids exhibit worry in response to certain dental stimuli (such a drill or needle), others have more widespread anxiety (3,4)-(3,5).Injecting LA can be uncomfortable, even though it helps manage pain during dental operations. A small number of research indicate that needles are the dental instrument that causes the most fear and anxiety (6).

Distraction is a behavior management strategy that lowers anxiety by diverting the patient's attention from the triggers.This method's primary goal is to calm the patient and lessen their anxiety while receiving therapy. Numerous studies suggest that the perfect distracter would necessitate the patient's active emotional involvement, optimal attention span across various sensory modalities (visual, aural, and kinesthetic), and participation in order to compete with the signals from the unpleasant stimuli (6–10)(11–13).

While passive forms of distraction, like watching TV or listening to music, accomplish this through a child's observation of an activity or stimulus rather than their explicit participation, active forms encourage a child's participation through a variety of sensory components, including virtual reality, interactive toys, controlled breathing, guided imagery, and relaxation. In this

study, watching cartoons served as a passive distraction tactic, whereas playing mobile phone video games served as an active one.

The age group of the patients selected for the study was 4-8 years as this is the age group, which shows most disruptive or negative behavior and is most difficult to manage. Venham's picture test,which was used in the study, is among one of the reliable measures of self-reported anxiety in children.Venham's anxiety rating scale is also an effective and reliable means of assessing anxiety in children.

One of the most widely accepted techniques for assessing physiological changes is the pulse oximeter, which measures both oxygen saturation and pulse rate. It provides continuous percentage readings of the patient's arterial hemoglobin oxygenation in addition to the pulse rate

According to the study's observations, Venham's picture test produced statistically inconclusive results; yet, the children's picture selection remained constant across the four visits. The picture test was a useful indicator of the child's emotional state in that specific situation, even though the results were not entirely definitive. This finding was consistent with previous findings.(14).

The study's findings show that while the oxygen saturation decreased as the pulse rate rose, there was no statistically significant variation. This was in line with previous research (15), who had noted a similar pattern.

The sound and look of the hand piece are the causes of the elevated anxiety during the cavity preparation and restoration visits. Additionally, Kleinknecht et al. noted this.The extremely stressful extraction incident was the cause of the past visit's anxiety peak. Baldwin also noticed this finding.(16) The sight of the injection may perhaps have contributed to the increase in anxiety at the previous appointment.

Given that the pulse rate peaked during the injection phase, this suggests that the rise has a psychosomatic cause. The larger increase in pulse rate may be explained by catecholamine release and sympathetic activation brought on by the anticipation of an injection.

Observations from the results showed that audio distraction did not have a significant effect on reduction of anxiety. This was also observed by Aitken *et al*.It was also noted that the anxiety ratings in this group were lower as compared to the control group. This may be attributed firstly to the relaxation effect of music, and secondly, because the sound of music will eliminate unpleasant dental sounds such as the sound of handpiece.(17)

The results from this study showed that audiovisual distraction was the most effective means of managing the anxiety in children. Although not many studies have shown the effectiveness of audiovisual distraction in managing anxious pediatric dental patients, some studies have shown its effectiveness in managing anxious adult dental patients.(17,18)

Our results may vary as a result of the various approaches and strategies we have employed. There are several possible explanations for why the audiovisual distraction technique reduces

anxiety. First, the patient selected the distraction in our study. This will assist the kids control the unpleasant input and make them feel as though they are in a familiar setting, claim Klein and Winklestein(17–19).Second, a child watching an audiovisual presentation will be distracted by multiple senses because they will likely focus on the TV screen, which will block out the image of dental treatment . Additionally, the program's sound will help the child block out unpleasant dental sounds, like the sound of a handpiece.[(2,17–19)(20,21)

CONCLUSION

Following conclusions were drawn from the study:Audiovisual distraction technique was more effective in managing anxious pediatric dental patient as compared to audio distraction technique and normal dental setup.Dental anxiety is seen commonly during routine dental procedures and is maximum during the extraction procedure.The patients had an overwhelming response to music presentation and wanted to hear it at their subsequent visits.

References

1. Wilson S. Oral Sedation for Dental Procedures in Children. Springer; 2015. 229 p.
2. Allen KD, Stanley RT, McPherson K. Evaluation of behavior management technology dissemination in pediatric dentistry. Pediatr Dent. 1990 Apr-May;12(2):79–82.
3. Milgrom P, Weinstein P, Getz T. Treating Fearful Dental Patients: A Patient Management Handbook. 1995. 386 p.
4. Marrison C. The Fundamentals of Risk Measurement. McGraw Hill Professional; 2002. 430 p.
5. Spielberger CD. Anxiety and Behavior. Academic Press; 2013. 431 p.
6. Öst LG, Skaret E. Cognitive Behavioral Therapy for Dental Phobia and Anxiety. John Wiley & Sons; 2013. 256 p.
7. Eli I. Oral Psychophysiology: Stress, Pain, and Behavior in Dental Care. CRC Press; 2020. 329 p.
8. American Dental Association. The Journal of the American Dental Association. 1985. 758 p.
9. Jeevanandan G, Govindaraju L, Subramanian EMG, Priyadarshini P. Comparative Evaluation of Quality of Obturation and Its Effect on Postoperative Pain between Pediatric Hand and Rotary Files: A Double-blinded Randomized Controlled Trial. Int J Clin Pediatr Dent. 2021 Jan-Feb;14(1):88–96.

10. Govindaraju L, Jeevanandan G, Subramanian EMG. Comparison of quality of obturation and instrumentation time using hand files and two rotary file systems in primary molars: A single-blinded randomized controlled trial. Eur J Dent. 2017 Jul-Sep;11(3):376–9.

11. Kumar D, Gurunathan D. Primary Canine and Molar Relationships in Centric Occlusion in 3- to 6-year-old Children: A Cross-sectional Survey. Int J Clin Pediatr Dent. 2019 May-Jun;12(3):201–4.

12. COMPARATIVE EVALUATION PAIN CHILDREN DURING INJECTION LOCAL ANESTHESIA COMBINATION COLD VIBRATING DEVICE INJECTION ALONE. SPLIT MOUTH RANDOMIZED CROSSOVER. Authors Dinesh KUMAR. EMG SUBRAMANIAN;

13. Subramanian EM, Ravindran V, Jeevanandan G. Comparison Amount Tooth Reduction Primary first Molar Stainless Steel, Zirconia Fibre-glass Crowns-In-Vitro Study. Int J Dentistry Oral Sci. 2021;8(7):3427–30.

14. Schuurs AHB. Factors Associated with Regularity of Dental Attendance: An Empirical-psychological Investigation. 1981. 400 p.

15. Alternative & Complementary Therapies: A New Bimonthly Publication for Health Care Practitioners. 1997. 624 p.

16. Alwin NP, Murray JJ, Britton PG. An assessment of dental anxiety in children. Br Dent J. 1991 Oct 5;171(7):201–7.

17. Dean JA, Avery DR, McDonald RE. McDonald and Avery Dentistry for the Child and Adolescent - E-Book: McDonald and Avery Dentistry for the Child and Adolescent - E-Book. Elsevier Health Sciences; 2010. 719 p.

18. The Journal of Clinical Pediatric Dentistry. 2000. 402 p.

19. Mcdonald M, Dean J, Avery. Mcdonald and avery´s odontopediatria para crianças e adolescentes 9a edição. Elsevier Brasil; 2011. 2117 p.

20. Columbus A. Advances in Psychology Research. Nova Publishers; 2006. 218 p.

21. Morse DR, Furst ML. Stress and Relaxation: Application to Dentistry. Charles C. Thomas Publisher; 1978. 298 p.