ORIGINAL ARTICLE DENTISTRY

Journal of Contemporary Medicine and Dentistry
www.jcmad.com

ISSN [P-2347-4513]
ISSN [O-2349-0799]
Year: 2022, Volume: 10
Issue: 1, p:05-09

A Comparative Study of Managing Anxious Child Patient Using Audio and Audio-Visual Distraction (AVD) Techniques

Suprika Dugad, [1] Kunal Ashok Janrao [2]

1. Consulting Pediatric Dentist, Pune, Maharashtra, India
2. Consulting Periodontist and Implantologist Pune, Maharashtra, India

Abstract

Background: *Pediatric patient's behavior management is an essential part of pediatric dental practitioners. For this distraction techniques play an important role. In the present study management of child patient with audio and audio-visual distraction techniques were compared.* ***Methods****: The child patients were divided into 3 groups with 30 patients in each group. The 1st group (group I) consisting of control group received treatment with no help of any distraction aids. In 2nd group child receiving audio distraction aids and in 3rd group child receiving audio-visual distraction aids were placed. Each child had 3 dental visits, diagnosis, prophylaxis visit and treatment visit including extraction or restoration. Anxiety levels in child patients were studied with the help of three parameters Venham's rating of clinical anxiety, pulse rate and oxygen saturation. Statistical analysis was performed with the help of IBM SPSS version 20 using One-way ANOVA test.* ***Results****: On comparison of the scores on diagnosis, prophylaxis and treatment visit in different groups, it showed highly significant (One-way ANOVA, p<0.001) increase of the Venham's anxiety scale and pulse rate, while scores of the oxygen saturation showed significant increase (One-way ANOVA, p<0.05) for all the visits.* ***Conclusion****: The present study concludes that audiovisual distraction technique is very useful as a method of distraction technique than the audio distraction technique alone.*

Keywords*: Anxiety in Children, Dental Treatment, Distraction Techniques.*

Address for correspondence: Dr. Kunal Ashok Janrao, Consulting Periodontist and Implantologist Pune, Maharashtra, India. Email: k_janrao121@gmail.com

Date of Acceptance: 09/02/2022

Introduction

In pediatric dental practice behavior management of the child patients is an essential part. Children usually do not co-operate in the dental chair and thus may cause limitations in providing quality dental care.[1] If these problems were not resolved, it can result in persistent negative response from the patient.[2] Generally anxious patients feel more pain during injections of local anesthesia and of longer duration than the less anxious patients.[3] Various behavior management techniques are concerned with the education and communication. The relationship concerned with the dental team, child and the child's family is an energetic process. It may start before the child treatment and can engage written information as well as body language, exchange of ideas, voice tone, facial expression and touch.[1] It is very important for the clinicians and patient families how they sedate effectively during the dental procedures. Pharmacological methods and non-pharmacological methods of behavior management are available.[4] The present study was planned to compare the management of the pediatric patients usingaudio and audiovisual distraction techniques.

Materials and Methods

N=90 child patients of age between 4 to 10 years having no past dental experience were included in the study. Ethical approval was taken from the ethical committee before start of the study and informed consent was taken from the parents of all patients. The child patients were divided into 3 groups with 30 patients in each group. The 1st group (group I) consisting of control group received treatment with no help of any distraction aids. In 2nd group child receiving audio distraction aids and in 3rd group child receiving audio-visual distraction aids were placed. Each child had 3 dental visits, first for the screening or diagnosis visit and second for the prophylaxis visit and third treatment visit including extraction or restoration. Anxiety levels in child patients were studied with the help of following 3 parameters: Venham's rating of clinical anxiety, pulse rate and oxygen saturation.

Statistical Analysis

The results were recorded, tabulated and statistical analysis were performed with the help of IBM SPSS version 20 using One-way ANOVA test.

Results

Comparison of the scores of the Venham's anxiety scale by one- way ANOVA test in group I showed non-significant increase from first visit of screening to third visit of treatment. But the increase of the pulse rate and oxygen saturation were found to be significant (One-way ANOVA, $p<0.05$) and highly significant (One-way ANOVA, $p<0.001$) respectively. (Table 1)

Table 1: Comparison of the scores of Venham's anxiety scale, pulse rate and oxygen saturation diagnosis, prophylaxis and treatment visit in group I.

Visits	*Venham's anxiety scale (Mean ± SD)*	*Pulse rate (Mean ± SD)*	*Oxygen saturation (Mean ± SD)*
Screening/ Diagnosis	2.33 ± 0.80	100.33 ± 2.08	98.06 ± 1.41
Prophylaxis	2.16 ± 0.83	99.26 ± 1.63	97.40 ± 1.42
Treatment	2.43 ± 0.89	102.26 ± 2.33	98.46 ± 1.65
F value	0.76	16.66	3.86
P value	0.4707	<0.001*	<0.05*

* Significant

In group II, the pulse rate showed highly significant increase from first visit of screening to third visit of treatment (One-way ANOVA, $p<0.001$), while the scores of the Venham's anxiety scale and oxygen saturation showed non-significant (One-way ANOVA, $p>0.05$) results. (Table 2) In case of group III, all the three parameters showed non-significant results (One-way ANOVA, $p>0.05$). (Table 3)

Table 2: Comparison of the scores of Venham's anxiety scale, pulse rate and oxygen saturation diagnosis, prophylaxis and treatment visit in group II.

Visits	*Venham's anxiety scale (Mean ± SD)*	*Pulse rate (Mean ± SD)*	*Oxygen saturation (Mean ± SD)*
Screening/Diagnosis	1.93 ± 0.86	98.30 ± 1.36	97.10 ± 1.32
Prophylaxis	1.73 ± 0.78	97.23 ± 1.40	96.41 ± 1.63
Treatment	2.06 ± 1.01	99.76 ± 1.75	97.43 ± 1.54
F value	1.06	21.0	3.68
P value	0.3508***	<0.001*	0.0292***

* Significant

Table 3: Comparison of the scores of venham's anxiety scale, pulse rate and oxygen saturation diagnosis, prophylaxis and treatment visit in group III.

Visits	*Venham's anxiety scale (Mean ± SD)*	*Pulse rate (Mean ± SD)*	*Oxygen saturation (Mean ± SD)*
Screening/Diagnosis	1.23 ± 1.27	96.53 ± 1.92	96.50 ± 2.04
Prophylaxis	1.00 ± 0.64	96.50 ± 1.97	96.03 ± 2.01
Treatment	1.23 ± 1.54	97.36 ± 1.97	96.86 ± 1.90
F value	0.44	1.88	1.32
P value	0.6454	0.158	0.2724

On comparison of the scores on diagnosis visit in different groups, it showed highly significant (One-way ANOVA, $p<0.001$) increase of the Venham's anxiety scale and pulse rate, while scores of the oxygen saturation showed significant increase (One-way ANOVA, $p<0.05$). (Table 4)

Table 4: Comparison of the scores of venham's anxiety scale, pulse rate and oxygensaturation for group I, group II and group III at diagnosis visit.

Visits	*Venham's anxiety scale (Mean ± SD)*	*Pulse rate (Mean ± SD)*	*Oxygen saturation (Mean ± SD)*
Group I	2.33 ± 0.80	100.33 ± 2.08	98.06 ± 1.41
Group II	1.93 ± 0.86	98.30 ± 1.36	97.10 ± 1.32
Group III	1.23 ± 1.27	96.53 ± 1.92	96.50 ± 2.04
F value	9.2	32.72	7.09
P value	<0.001*	<0.001*	<0.05*

* Significant

Also, comparison of the scores on prophylaxis and treatment visit in different groups, it showed highly significant (One-way ANOVA, $p<0.001$) increase of the Venham's anxiety scale and pulse rate, while scores of the oxygen saturation showed significant increase (One-way ANOVA, $p<0.05$) for both the visits. (Table 5 and 6)

Table 5: Comparison of the scores of venham's anxiety scale, pulse rate and oxygensaturation for group I, group II and group III at prophylaxis visit.

Visits	Venham's anxiety scale (Mean ± SD)	Pulse rate (Mean ± SD)	Oxygen saturation (Mean ± SD)
Group I	2.16 ± 0.83	99.26 ± 1.63	97.40 ± 1.42
Group II	1.73 ± 0.78	97.23 ± 1.40	96.41 ±1.63
Group III	1.00 ± 0.64	96.50 ± 1.97	96.03 ±2.01
F value	18.14	21.56	5.15
P value	<0.001*	<0.001*	<0.05*

* Significant

Discussion

Dental anxiety is defined as "a feeling of fretfulness about dental treatment that is not essentially connected to a particular external stimulus."[1] In case of the child patients coming to the dental clinics, the procedures are often unexpected, painful and heightened by the stressful situations and anxiety leading to overall unpleasantly experience to the child patient. Though the basic principles of pain evaluation and management are same across

the human lifespan, the infants and children usually present specific challenges that contain the consideration of the patient's age, cognitive and communication skills, developmental level, associated beliefs and previous dental pain or treatment experience.[5]

Causes of Dental Anxiety: three main aspects should be considered.[6]

1. Direct conditioning to aversive encounters in the dental office.
2. Vicarious learning, through role models, such as family, peers and society.
3. Psychodynamic and personality aspects, i.e. specific traits that when present, increase the patient's proneness for apprehension in the dental setting.

The objectives of child management should the following[1]:

1. To assemble the child comfortable
2. To offer freedom from pain
3. To execute the procedures safely
4. To hold out the treatment capable and
5. To boast the child and the parent agreement to the procedures.

The method becoming popular distraction technique nowadays has been audio analgesia. It presents music or white noise to patients during the dental visit. It was introduced in 1959 by Gardner and Licklider.[7] Audio analgesia considered as a potent substitute for nitrous oxide or local anesthesia. Unfortunately, later reports of its effectiveness were found to be varied, and its popularitywas questioned.[2] Non pharmacological behavioral management includes tranquilizing verbal approaches, parental presence and reassurance, physical contact by light touching or stroking and music. These are routinely used tactics to decrease the anxiety and gain children's cooperative behavior in the child dental care.[4] The attitudes of the parents and the pediatric dental practitioners toward the traditional behavior management methods are changing. For example, immobilization in a papoose board, although effective, has been shown to be unacceptable among a majority ofparents.[8,9] In addition, many parents feel that pharmacological methods of managing their child are undesirable due to perceived medical risks. For these reasons, clinicians have developed non-aversive behavior management techniques that may be equally effective and more acceptable to parents, patients and practitioners.[10] Although these methods are useful, they have limited effectiveness especially for the very anxious pediatric patients. Audio and audiovisual distraction techniques are very promising methods offering an additional non-pharmacological technique of sedation to decrease the unpleasantness concerned with the various dental treatments.[4] It is a helpful distraction technique as it takes control over child in an enjoyable way having two types of sedations of hearing and visual. Also, it partially isolates the child from the sound and sights of unfriendly dental environment. This recognition of the powerful distraction potential of audio and audiovisual techniques has led many dentists to install television screens in the pediatric dental care.[4,10,11] Nowadays the development of wireless audiovisual eyeglasses that are easy to use, inexpensive, and comfortable for the dentist and the child has opened further opportunities for usage in dental treatment. It also includes listen to music or stories during a stressful procedure. A controlled research study with children compared ADV using wireless glasses with nitrous oxide and the result has confirmed the efficacy of the AVD methodology.[4] In present study comparison of the scores of the Venham's anxiety scale, pulse rate and oxygen saturation in group I, II and III not showed very promising results. But, on comparison of the scores on diagnosis, prophylaxis and treatment visit in group I, II and III showed highly significant increase of the venham's anxiety scale, pulse rate and oxygen saturation. The results of the present study were similar to the study done by Prabhakar AR et al[12] and Naithani M et al[13], which also found that the audiovisual distraction technique more effective than the audio technique alone.

Howitt J et al[14] done study on audio analgesia in 138 children aged 8 to 14 years and found that patients' pain tolerance thresholds were increased under a white noise condition. Recently in a study by Corah N et al[15] patients were given a ping-pong video game during dental treatment. This distraction method was

effective in reducing patient anxiety, as assessed by the dentist and the patient. The effects were most pronounced for patients initially classified as highly anxious.[2]

Various new methods of delivering audio distraction methods are available nowadays. Portable video entertainment system called personal video eyewear provides a relaxed environment during dental treatment. In comparison to traditional audiovisual programs that use a large television monitor above the patient's chair, this personal video eyewear system includes a lightweight eyeglass having a built-in television monitor along with stereo earphones. Patients focus their attention on the relaxation video instead of anxiety- inducing dental equipment (syringe, drill, endodontic files, rubber dam) or noises. The music in the video coming through the earphones not only shields the drilling noise, but also, enhances the relaxation felt by the patient. It has been reported previously that such an audiovisual system is beneficial in the reduction of fear and pain for both adults and children undergoing dental prophylaxis and restorative procedures.[16,17]

Conclusion

The present study concludes that audiovisual distraction technique is very useful as a method of distraction technique than the audio technique alone. This method has shown the promising results in reducing the anxiety of the patients. This method can be routinelyused as distraction technique in pediatric dental care after validating the results of the present study including large number of the pediatric patients.

***Conflict of Interest*: None**
***Source of support*: Nil**
***Ethical Permission*: Obtained**

References

1. Singh H, Rehman R, Kadtane S, Dalai DR, Jain CD. Techniques for the Behavior Management in Pediatric Dentistry. Int J Sci Stud 2014;2(7):269-72.
2. Venham LL, Goldstein M, Gaulin-Kremer E, Peteros K, Cohan J, Fairbanks J. Effectiveness of a distraction technique in managing young dental patients. Pediatric Dentistry 1981;3(1):7-11.
3. Van Wijk AJ, Hoogstraten J. Anxiety and pain during dental injections. J Dent 2009; 37:700-04.
4. Florella M, Sarale C, Ram RD. Audiovisual iatrosedation with video eyeglasses distraction method in pediatric dentistry: case history. Journal of International Dental And Medical Research 2010;3(3):133-6.
5. Srouji R, Ratnapalan S, Schneeweiss S. Pain in Children: Assessment and Nonpharmacological Management. International Journal of Pediatrics 2010; Article ID 474838:1-11.
6. Eli I, Uziel N, Blumensohn R, Baht R. Modulation of dental anxiety: the role of past experiences, psychopathologic traits and individual attachment patterns. Br Dent J 2004;196(11):689-94.
7. Gardner, W. and Licklider, J.: "Audio analgesia in dental operation," J Am Dent Assoc 1959;59:1144-50.
8. Lawrence SM, McTigue DJ, Wilson S, Odom JG, Waggoner WF, Fields HW. Parental attitudes toward behavior management techniques used in pediatric dentistry. Pediatr Dent 1991;13(3):151-5.
9. Murphy MG, Fields HW, Jr., Machen JB. Parental acceptance of pediatric dentistry behavior management techniques. Pediatr Dent. 1984;6(4):193-8.
10. Aitken JC, Wilson S, Coury D, Moursi AM. The effect of music distraction on pain, anxiety and behavior in pediatric dental patients. Pediatric Dentistry 2002;24(2):114-8.
11. Goyal P, Rani S, Bansal S, Mahajan S. Management of sobbing tot in a pediatric dental office: A review. Int J Contemp Dent Med Rev 2015; Article ID: 290115, 2015. doi: 10.15713/ins.ijcdmr.49.
12. Prabhakar AR, Marwah N, Raju OS. A comparison between audio and audiovisual distraction techniques in managing anxious pediatric dental patients. J Indian Soc Pedod Prevent Dent 2007;177-82.
13. Naithani M, Viswanath D. Child's dental anxiety: Management by audio and audio-Visual distraction technique – A comparative study. Univ Res J Dent 2014; 4:101-7.
14. Howitt J. An evaluation of audio-analgesia effects. J Dent Child 1967; 34:406-11.
15. Corah N, Gale E, Illig S. Psychological stress reduction during dental procedures. J Dent Res 1979;5 8:1347-51.
16. Frere CL, Crout R, Yorty J, McNeil DW. Effects of audiovisual distraction during dental prophylaxis. J Am Dent Assoc 2001; 132:1031-8.
17. Ram D, Shapira J, Holan G, Magora F, Cohen S, Davidovich E. Audiovisual video eyeglass distraction during dental treatment in children. Quintessence Int 2010; 41:673-79.