Original Article

Evaluation of Measures of Association on Dental Anxiety Management

R. Hemalatha[1]*, S. Nirmala[2], Viswaja[3]

[1] Research Scholar, Department of Pediatric and Preventive Dentistry, SRM Dental College, Ramapuram, Chennai, Tamil Nadu, India.

[2] Professor & Head, Department of Biochemistry, SRM Dental College, Ramapuram, Chennai, Tamil Nadu, India.

[3] Professor & Head, Department of General Pathology, SRM Dental College, Ramapuram, Chennai, Tamil Nadu, India.

*Corresponding Author: Dr. R. Hemalatha

Research Scholar, Department of Pediatric and Preventive Dentistry, SRM Dental College, Ramapuram, Chennai, Tamil Nadu, India.

Orcid ID : 0000-0002-2400-8280.

DOI: 10.47750/pnr.2023.14.03.129

Abstract

Background Dental anxiety is an issue faced by children globally, which denies access to the right treatment modalities.KAP studies include three components namely knowledge, attitude and practice. They assess health care delivery systems. The present study aimed to compare the effectiveness between an audio-visual educational module over a traditional instruction module in improving assistance to combat dental anxiety. **Materials and Methods** Sixteen patients were recruited in each group for the study and followed up for a six month period in Chennai city. The knowledge, attitude and practice of parents regarding dental anxiety management strategies were assessed by way of an empirical inquiry guide. **Results** There was a significant improvement in the knowledge aspect of anxiety management from baseline to 6 months, with audio visual aid showing a better response in comparison with the traditional module. **Conclusion** Customized audio visual aid served the purpose of reducing dental anxiety by a great extent in comparison with the traditional module. This was readily accepted by the parents of the children who participated in the study.

Keywords: Dental anxiety, relief measures, children, education, models.

INTRODUCTION

Dental anxiety is a globally challenging scenario, though there may be variations in the degree of anxiety due to the influences based on ethnicity, race, culture and socio-economic background. [1] There is an immediate need to ratify or eliminate this emotional perspective at an early stage to help children move towards an anxiety free citizen, thereby to emerge into an anxiety free society in future. [2]

Fear and anxiety towards the dentist and dental treatment are both significant characteristics that contribute to avoidance of dental care. Anxiety associated with the thought of visiting the dentist for preventive care is referred to as dental anxiety. It has been cited as the fifth most common cause of anxiety. [3] It is an emotional state that precedes the actual encounter with the threatening stimuli, which is not identifiable. It is normally experienced in various aspects of routine life in different situations and circumstances. [4]

Odontophobia refers to over whelming or irrational fear of dentistry associated with devastating feelings of hypertension, terror, trepidation and unease. This is a frequently encountered problem in the dental office. [5, 6] Anxiety is often linked to painful stimulus and increased pain perception, with an exaggerated memory of pain. Treating such patients are stressful for the dentist, due to the reduced co-operative status. It requires more time and resources leading to an unpleasant experience for both the child and the dentist. Children resort to mal adaptive behavior by avoiding a dental visit. Leading to a dental neglect. [7]

These children visit their dentists only on emergencies and more complicated issues to be dealt with. In order to enhance knowledge in this aspect a primary education model is necessary, hence we ventured out to create an audio-visual simulation

model to help such anxious children. The trial was conducted to compare the effect of the audio-visual model over traditional method. [8,9]

MATERIALS AND METHODS

Study design : KAP Study

32 children were recruited (16 in each group).After obtaining consent from the parents a face-face personal interview was done using a questionnaire to assess baseline knowledge, attitude and practice regarding dental anxiety in children.

Group 1- Traditional pamphlet model

Group 2- Audio-visual model

Study Design

A study was conducted among children. The study followed the guidelines by Helsinki Declaration1975, revised 2003. After explaining the purpose and details of the study informed consent and assent was obtained from parents and children **Subjects**

Sample size calculation

Based on the previous Indian studies, the sample size was calculated to be 32, with 16 in each group. They were recruited by simple randomization method.

Inclusion criteria

Children within 14 years were included.

Exclusion criteria

Children with major debilitating disorders and physically challenged children were excluded from the study.

Sampling Technique

Multi stage sampling technique

Data collection

Patient demographics along with dental anxiety status was recorded by way of personal interview through customized structured questionnaires.

Data Recording

Clinical examination was done by a single examiner in the OP premises.

Statistical Analysis

KAP parameters were assessed by Chi square, Mc Nemars and marginal homogeneity test.

RESULTS

A total of 32 children were included for the study. KAP parameters were assessed . Chi square test assesses the differences between observed and expected values. Mc Nemars is a statistical test used on paired nominal data that evaluates the hypothesis about the data. There was a significant improvement in the knowledge aspect of anxiety management from baseline to 6 months, with audio visual aid showing a better response in comparison with the traditional module

Table 1 Comparison of dental anxiety reduction status between the two groups according to treatments

Rate of anxiety reduction	Traditional model		Audio-visual model		P value
	Mean	SD	Mean	SD	
Prophylaxis	0.09	0.08	0.05	0.06	.084
Restorations	0.29	1.19	0.15	0.84	.245
Pulpotomy	0.32	0.20	0.41	0.14	.142
Pulpectomy	0.33	0.18	0.40	0.24	.345
Extraction	0.33	0.16	0.48	0.23	.050
Sealant application	0.34	0.16	0.45	0.18	.048
Fluoride application	0.36	0.18	0,44	0.14	.019

Table 2 : Comparison of dental anxiety reduction status between the two groups according to treatment visits

Rate of anxiety reduction	Traditional model		Audio-visual model		P value
	Mean	SD	Mean	SD	
Initial visit	0.05	0.29	0.01	0.08	.063
Counseling	1.65	0.66	1.99	0.29	.091
Patient education	1.82	0.44	2.14	0.55	.099
Dept tour	1.75	0.66	2.15	0.65	.126
! st visit	1.81	0.50	2.27	0.66	.048
2 nd visit	2.16	0.55	1.95	0.66	.377
3 rd visit	1.94	0.45	2.01	0.54	.722

Table 1 showed continuous parameters which were assessed by T-test. Continuous parameters are numeric parameters that can take up ay value in specific intervals. KAP parameters were assessed by Chi square, Mc Nemars and marginal homogeneity test. It depicted the rate of anxiety reduction with regards to various treatment aspects like prophylaxis, restoration, pulpotomy, pulpectomy, extraction, sealant and fluoride application.. Chi square test assesses the differences between observed and expected values. Mc Nemars is a statistical test used on paired nominal data. It uses contingency tables with a dichotomous trait. It uses matched pair of subjects. It determines if row and column frequencies are equal. It tests if there is marginal homogeneity. Mc Nemars evaluates the hypothesis about the data.

Table 2 showed the comparison of dental anxiety reduction status between the two groups according to treatment visits. . It depicted the rate of anxiety reduction with regards to various treatment visits like initial, counseling, patient education, department tour and 1,2 3 rd visits.

DISCUSSION

The present study was aimed to estimate the measure of association on dental anxiety management where continuous parameters were assessed . It depicted the rate of anxiety reduction with regards to various treatment aspects like prophylaxis, restoration, pulpotomy, pulpectomy, extraction, sealant and fluoride application. The results of our study was in accordance with similar studies done by Maggirias J et al. [4-7]

A study by Jason Mathew Armfield [8-11], [16] was done to measure dental fear and to assess the need to measure fear. These debilitating conditions compromises several different dimensions including cognitive, emotional, behavioral and physiological components. A number of indices have been developed to measure dental anxiety and fear, but their number is indicative of a continuing problem with delineating the concept of dental fear and anxiety and the means of their measurement. The paper addresses the use of relevant terminologies and aims to trace and assess the theoretical relevance of selection of the most widely used self report measures.

The study concluded that the most popular measures of dental anxiety and fear lack adequate theoretical foundations. These scales by their very nature, serve to define the concept they aim to measure. With the break- through in technological advancements in all fields, we ventured to use it rightly to cater to the customized needs of our patients. Questionnaire helped us to get a consolidated view with regards to knowledge, attitude and practice of dental anxiety amongst children. It also helped to lay our key focus aspects on the thrust areas of dental anxiety. Audio –visual model scored better in all aspects and was well appreciated by both parents and children.

A study by Lei Dou et al [12-14], [17]was done to assess the prevalence of dental anxiety and it's association with pain and other variables among adult patients with irreversible pulpitis. 130 patients with irreversible pulpitis were included in this cross-sectional study. Participants were asked to fill out an information table and a battery of questionnaires to assess their level of dental anxiety, pain at their most recent dental experience and pain intensity before and during the endodontic treatment.

The level of anxiety that patients displayed during the present treatment was also evaluated by the dentists using an anxiety rating scale. Data were analyzed by t- test, Anova and Spearman's correlation tests. The results revealed that83.1% of patients suffered from moderate or high dental anxiety and 16.2% met the criteria for specific phobias. Subjects who higher MDAS scores were more likely to postpone their dental visits ($P < 0.05$) was important for correlating with dental anxiety among participants. 36.2% of participants displayed moderate to severe anxiety during this visit for endodontic treatment based on the dentist's judgement.

Pain at the most recent dental visit and during endodontic treatment have a strong positive association with dental anxiety. Effective pain control in endodontics is beneficial to manage anxiety.

A study by Ulla Wide et al [15], [16] [18] was done to assess the treatment of dental anxiety and phobia for diagnostic criteria and conceptual model of behavioral treatment . Dental anxiety and phobia are still prevalent among individuals and should be considered a public health issue. Dental anxiety and phobia is often described as a vicious cycle where avoidance of dental care, poor oral health and psychosocial effects are common features. Treatment should include therapy for dental anxiety/ phobia and oral diseases. The paper discusses the etiology, prevalence and diagnosis of dental anxiety, phobia and presents a conceptual treatment model at the dental fears research and treatment center in Sweden. In addition based on systematic reviews, evidence based treatment for dental anxiety is revealed including the inter- disciplinary approach between psychology and dentistry.

A study by Buldur B and Candan M· [19] was done to evaluate the effect of virtual reality on dental anxiety, pain and behavior at different time points among children undergoing dental treatment under local anesthesia. The study was a randomized trial. It was two –armed, within- subject, cross-over, placebo controlled trial that included 76 children. Eligible participants were treated in two dental visits using the following dental methods, with protective glasses, without distraction(attention placebo controlled) and with treatment condition of virtual reality.

Primary outcomes were dental anxiety and pain, secondary outcomes was dental visit behavior. Subjective measurements for each variable were also performed. Significant reduction in dental pain and anxiety was observed in the virtual reality group, according to the heart rate scores. No statistical differences were observed in the self report measures. Decreased dental anxiety and pain were associated with the first visit sequence with virtual reality. Decreased dental anxiety were lower during local anesthesia. The study concluded that virtual reality significantly reduced pain and anxiety during local anesthesia. Therefore it can be recommended during treatment in school aged children.

A study by Armfield [20-22] and Heaton was done to assess the management of fear and anxiety in the dental clinic. People who are anxious about undergoing dental treatment comprise approximately one in seven of a population and require considerate management by dental practitioners. The paper reviews various non pharmacological techniques that can be used in the dental clinics in order to assist anxious individuals. Practical advice is provided for managing anxious patients. Evidence base for various approaches is examined and summarized. The importance of firstly to identify dental fear and then to understand the etiology, nature and associated components is stressed. Anxiety management techniques range from establishing good communication and rapport to the use of systematic desensitization and hypnosis. Some techniques require training but others could be adopted for all patients, regardless of their dental anxiety. The study concluded that successfully managing fearful individuals is achievable for clinicians but requires a good level of understanding, communication and phased treatment approach.

Another study by Kauther Musalam [23] estimated that about 40 % of the population suffer from dental anxiety. It is a complex and multi-factorial phenomenon with a wide range of provoking factors. The study aimed to assess the magnitude and determinants of dental anxiety among patients attending public dental clinics in Dar- Es- Salaam, Tanzania. It was a descriptive cross –sectional study among 300 patients who had dental caries, periodontal disease or trauma. Data was collected in an MDAS questionnaire and analyzed with SDPSS version 23.Anova was used to assess the association between the variables and the significance level was set at $p < o.05$. Male to female ratio was 1: 1.43. The mean MDAS score was 12.84+/- 4.99.The main anxiety provoking factors were apprehension and unawareness of procedures. The level of anxiety was statistically significant ($p < 0.05$) The prevalence of de3ntal anxiety was high among the participants of the study. The study concluded that female gender, education at higher level and young age constituted the determinants of dental anxiety.

A study by Harri Halonen et al [24] estimated the association between dental anxiety and psychiatric disorders and symptoms. The aim of the review was to explore how dental anxiety is associated with other psychiatric disorders and to estimate the level of comorbid symptoms in dentally anxious patients. The review was conducted and reported in accordance with MOOSE statement. Data sources included Pubmed, Psycinfo, Web of Science and Scopus. The search produced 631 articles of which 16 met the inclusion criteria. Study population was heterogeneous with 6486 participants, with 25 tests. The results enhanced the idea about the comorbidity between dental anxiety and other psychiatric disorders. The study concluded that patients with a high level of dental anxiety are more prone to have a high level of comorbid phobias, depression, mood disorders and other psychiatric disorders.

LIMITATIONS

Since the age ranges and sample sizes were small the findings could not be generalized

CONCLUSION

The results of the present study provided insights on measures of associated factors triggering dental anxiety in children. Dental anxiety is presenting challenges to the health care system globally. To emerge as successful clinicians, we need a thorough knowledge of causative factors to seek for the curative factors. Thereby further studies are needed on this aspect to generalize the findings.

CLINICAL IMPLICATIONS

Similar studies such as this with more multivariate factor analysis will help us to explore and evaluate further more on this aspect in order to inculcate more positive behavioral attitudes

DECLARATION OF INTERESTS : The authors declare no conflicts of interest.

FUNDING: No funding was acquired for this study

Conflicts of Interest : Nil

Author Contribution :

RH and SN conceived the ideas; RH and KV collected and analyzed the data; RH and SN led the writing.

Acknowledgement: NIL

REFERENCES

1. Thomson WM, Stewart JF, Carter KD, Spencer AJ: Dental anxiety among Australians. Int Dent J. 1996, 46:320-324.
2. Schwartz E, Birn H: Dental anxiety in Danish and Chinese adults-A cross cultural perspective. Soc Sci Med. 1995, 41:123-130.10.1016/0277-9536 (94)00288-5.
3. Sohn W, Ismail AI: Regular dental visits and dental anxiety in an adult dentate population. J Am Dent Assoc.2005, 136:58-66.
4. Maggirias J, Locker D: Five year incidence of dental anxiety in an adult population. Community Dent Health.2002, 19:173-179.
5. Locker D, Liddell A, Dempster L, Shappiro D: Age of onset of dental anxiety .J Dent Res.1999, 78: 790-796.
6. Ashkenazi M, Faibish D, Sarnat H: Dental fear and knowledge of children treated by certified paediatric dentists and general practitioners. ASDC J Dent Child.2002, 69:297-305.
7. Arnrup K, Berggren U, Broberg AG, Bodin L: A short-term follow-up of treatment outcome in groups of uncooperative child patients. Eur J Paediatr Dent. 2004, 5:216-224.
8. Skaret E, Weinstein P, Kvale G, Raadal M: An intervention program to reduce dental avoidance behavior among adolescence: A pilot study. Eur J Paediatr Dent.2003, 4:191-196.
9. Klingberg G, Berggren U, Carlsson SG, Noren JG: Child dental fear: Cause related factors and clinical effects. Eur J Oral S. 1995,103:405-412.10.1111/j. 1600-0722.1995.tb01865.x.
10. Economou GC: Dental anxiety and personality: Investigating the relationship between dental anxiety and self consciousness. J Dent Educ. 2003, 67:970-980.
11. Abrahamsson KH, Berggren U, Hallberg L, Carlsson SG: Dental phobic patients' view of dental anxiety and experiences in dental care : A qualitative study. Scand J Caring Sci. 2002, 16:188-196.10.1046/j.1471-6712.2002.00083.x.
12. Schou L: The relevance of behavioral sciences in dental practice. Int Dent J. 2000, 324-332.suppl
13. Berggren U: Long-term management of the fearful adult patient using behavior modification and other modalities. J Dent Educ. 2002, 65:1357-1368.
14. Frankel LR, Goldworth A, Rorty MV, Silverman WA: Ethical dilemmas in Pediatrics. Cases and commentaries.2005, Cambridge: Cambridge University Press.
15. Kvale G, Raadal M, Vika M, Johnsen BH, Skaret E, Vatnelid H, Oiama I: Treatment of dental anxiety disorders. Outcome related to DSM-IV diagnosis. Eur J Oral Sci. 2002, 110:69-74.10.1034/j.1600-0722.2002.11204.x.
16. Jason Mathew Armfield. How do we measure dental fear and what are we measuring anyway? Oral health and preventive dentistry. 8 (2):107-15. DOI : 10.3290/j.ohpd.a19198.
17. Lei Dou, Margaret Maria Vanschaayk, Degin Yang. The prevalence of dental anxiety and it's association with pain and other variables among adult patients with irreversible pulpitis.BMC Oral Health .Article number 101 (2018).
18. Ulla Wide and Magnus Hakeberg. Treatment of dental anxiety and phobia- Diagnostic criteria and conceptual model of behavioural treatment. Dentistry Journal. .2021, 9, 153. https:// doi.org/10.3390/dj 912015319.
19. Buldur B, Candan M. Does virtual reality affect children,s dental anxiety , pain and behaviour? A randomized, placebo- controlled, cross- over trial. Pesqui Bras Odontopediatria Clin Integr. https:// doi.org/10.1590/pboci 2021.002.
20. JM Armfield, LJ Heaton. Management of fear and anxiety in the dental clinic. A Review. Australian Dental Journal. Vol 58, Issue 4,p-390-407.
21. John R. Elter D.M.D, James D. Beck. Assessing dental anxiety, dental care use and oral status in older adults.The journal of American Dental Association. . Vol 128, Issue 5.1997. pg- 591-97.
22. Irene Kida Minja and Febronia Kokulengya Kahabuka. Dental anxiety and it's consequences to oral health care, attendance and delivery. Open access peer reviewed chapter. DOI 10.5772/ intechopen. 82175.
23. Kauther Musalam, Karpal S Sohal, Sira S Owinbingire and Baraka Kileo. Magnitude and determinants of dental anxiety among patients attending public dental clinics in Dar- Es- Salaam, Tanzania.. International Journal of Dentistry. Vol 2021. https:// doi.org. 10.1155/2021/ 9965204.
24. Harri Halonen, Jenna Nissinen, Heli Lehtiniemi, Tuula Salo, Pirkko Ripinen and Jouko Miettunen. The association between dental anxiety and psychiatric disorders and symptoms. A systematic Review. Clinical practice and epidemiology in mental health,2018, vol14, 207-222.