

INFLUENCE OF CHILDRENS' DENTAL ANXIETY ON THE ANXIETY LEVELS OF THE DENTAL OPERATORS: A CROSS SECTIONAL STUDY

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ABSTRACT:

Introduction: Dental anxiety among children has continued to generate a lot of curiosity in pediatric dentistry. It has been a potential problem in patient management. Early recognition of dental anxiety among children is essential for appropriate patient management and successful treatment

Objective: i) To assess the dental anxieties of children and operators in a dental operatory.

ii) To correlate childrens' dental anxiety and the anxiety levels of the operator in a dental operatory.

Material and Methods: The anxiety levels of children and operators was assessed using the VPT and FIS for children and a questionnaire for the operators respectively. The Venham picture test comprises eight cards, with two figures on each card, one "anxious" figure and one "non-anxious" figure. All cards will be shown in their numbered order. If the child pointed at the "anxious" figure a score of one was recorded, if the child pointed at the "non-anxious" figure a score of zero will be recorded. The Facial image scale comprises a row of five faces ranging from extremely anxious to not anxious. The children were asked to point a face they felt like themselves at that moment. The scale is scored by giving a value of one to the most positive face and five to the most negative face. The dental operator was given a self-administered questionnaire to assess their anxiety levels.

Results: Significant correlation was found between the anxiety levels of the children using both the scales i.e VPT and FIS ($p=0.034$). A significant correlation was found between the anxiety levels of the children using VPT ($p=0.002$) and FIS ($p=0.040$) scales and the dental operators.

Conclusion: The dental anxiety of the children visiting the dental operatory has an impact on the anxiety levels of the operator as well as on the behavior management techniques to be applied by the dentist. The knowledge of the dental anxiety of children will help the practitioners to adjust his or her treatment based on the child's fear and anxiety levels.

Keywords: Anxiety assessment scales, Venham Picture Test, Facial Image scale, Pediatric dentistry, Behavior Management.



INTRODUCTION:

Anxiety may be defined as apprehension or source which is unknown or unrecognized from a humanistic and behavioural perspective. Anxiety is considered normal and a healthy reaction towards a perceived threat.^[1] In children, both dental anxiety and fear of

dental treatment have been recognized as a source of problems in patient management for many years.^[2]

Fear of the dentist is a common problem experienced in dental practice. It can cause treatment difficulties for the

practitioner as well as for the patient. The degree of fear can vary between patients. Some experience only slight discomfort, while others experience extreme fear. Obviously not all frightening experiences are severe enough to be classified as pathological. A certain degree of discomfort is normal when pending an unknown and potentially unpleasant situation. This can be viewed as a reflection of the gradual transition between "normal" fear and pathological fear/anxiety. Fear and anxiety are highly related and are often used interchangeably in the literature.^[3]

Dental anxiety among children has continued to generate a lot of curiosity in pediatric dentistry. It has been a potential problem in patient management. The effects of dental anxiety can persist in adulthood which may lead to dental neglect.^[2] Dental anxiety is defined as "an abnormal fear or dread of visiting the dentist for preventive care or therapy and unwarranted anxiety over dental procedure" and may have psychological, cognitive and behavioral consequences.^[2-6]

Pathological fear of the dentist is known by the medical term odontophobia. Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) classifies odontophobia as an anxiety disorder, and subdivides it into the group of specific phobias.^[7]

Dental anxiety constitutes a major problem for patients and dental care

providers alike. Anxious patients tend to avoid treatment, and once they are in the dental chair, they are difficult to manage. Another factor that is associated with dental anxiety in children and adults alike is the awareness of a dental problem. Avoidance of dental treatment due to anxiety is very common and appears to be strongly associated with extreme deterioration of oral and dental health.^[2]

Early recognition of dental anxiety among children is essential for appropriate patient management and successful treatment.^[8] Only with children was it found that dentists change their behaviour by adopting anxiety management techniques *per se* when dealing with anxious children.^[9] It has been suggested that part of the dental anxiety may originate from traumatic experiences with dental treatment, dentists' bad attitudes, personality traits or lack of exposure to dental treatment at all.^[10] The dental anxieties in children and operator have been seldom studied together in same clinical setting. The dental school environment may provide a convenient set-up for assessing the dental anxiety of paediatric dental patients, and the caregivers.

Various methods have been used in literature for the assessment of dental anxiety. Dental anxiety is most commonly measured using questionnaires and rating scales.^[11] It can be evaluated by variety of

techniques such as: Physiological measures by measuring pulse rate, blood pressure, muscle tension,^[8] projective techniques such as children's dental fear picture test,^[14] psychological test such as Corah's Dental Anxiety scale (CDAS)^[12] and Modified Child Dental Anxiety Scale (MCDAS).^[13] The children's fear survey schedule-dental subscale (CFSS-DS) is another method to measure dental fear among young children.^[14] Venham Picture Test (VPT) has been used in a number of studies to assess anxiety before dental treatment. ^[9,15,16] Facial image scale (FIS) has been used by Buchanan and Niven (2002) to assess the anxiety among children during their first dental visit.^[15]

In the present study the Venham Picture scale and Facial Image Scale was used for evaluation of dental anxiety in children and a questionnaire for evaluation on the anxiety levels in the operator.

MATERIALS AND METHODS:

The study protocol was analyzed and approved by the Institutional Review Board and the Ethical Committee of Sinhgad Dental College and Hospital, Pune. Children were chosen through simple random sampling from the outpatient department along with their respective dental operators prior to the commencement of the dental treatment. The study protocol was explained to the parents and informed consent was obtained from the parents/guardians and assent was obtained from the

children between the age groups of 12 - 14 years.

The children were selected based on the following eligibility criteria:

- 1) Children aged between 4-14 years were included.
- 2) Patients from both the genders were included.
- 3) Patients and parents who give voluntary consent to participate in the study.
- 4) First dental visit.

Exclusion Criteria:

- 1) Study subjects not willing for participating in the study.
- 2) Physically and intellectually disabled children.

Prior to the commencement of the main study, a pilot study was conducted on 10 children in the outpatient department to check for feasibility of the survey and also to check for time and administrative management. These 10 students who participated in the pilot study were not included in the main study. According to the pilot study conducted the prevalence of dental anxiety in children was found to be 60%. Taking prevalence as 60% and substituting the values in the formula :

$$n = \frac{1.96^2 p(1-p)}{DEFF}$$

$$d^2$$

The sample size was determined to be 92 but we conducted the study on 100 children. The anxiety levels of children and operators were assessed using the VPT and FIS for children and a questionnaire for the operators respectively.

Facial image scale

This scale comprises a series of five pictures showing very happy to very unhappy faces. For the study, the scale was shown to children and they were asked to choose the image they identified with at that instant. The scores were recorded by assigning a value of one to the very happy face and five to the very unhappy face.

Venham's Picture test

This scale comprises eight cards with two figures on each, depicting one anxious and one non-anxious figure. The children were shown all the cards in an ordered sequence and were instructed to choose the image they closely identified with at that point. A score of one was recorded on choosing an anxious figure and zero was recorded if the child chose a non-anxious figure. The total score was added to obtain a final score out of eight.

Questionnaire to the dental operators:

The content validity of the questionnaire was tested in the pilot study. The year of study of the dental operator was recorded before giving out the questionnaire. The questionnaire for the dental operator was a close ended, self

administered questionnaire in English with five questions and was administered before starting the treatment of the child patient. The responses for all the questions in the self-administered were similar for assessment of the anxiety scores of the dental operators. The responses were given a scoring of : Not anxious-1, Slightly anxious-2, Fairly anxious-3, Very anxious-4, Extremely anxious-5. The questionnaire for the dental operators had a maximum scoring of 25 and minimum scoring of 5.

Statistical analysis of data was done using SPSS software (version 21, SPSS Inc, Chicago III, USA). The p value was taken as significant when less than 0.05 (confidence interval of 95%). Descriptive statistics was done to find mean and standard deviation of dental anxiety. Difference in the means between the VPT and FIS scale was found using *t*-test. Pearson's correlation test was done to assess the correlation between the variables.

RESULTS:

Hundred children reporting to the Department of Paediatric dentistry for their first dental visit were randomly selected for the study out of which 41 were boys and 59 were girls. The mean age of the boys was 7.68 ± 2.77 and of the girls was found to be 8.22 ± 3.06 .

Mean anxiety scores of the children according to FIS scale were 2.53 ± 1.01 and VPT scale were 4.84 ± 1.10 as well as

the mean anxiety scores of the operators were found to be 13.07 ± 2.85 (Table 1). According to gender a statistically significant correlation was found between the mean anxiety scores of the male and female children in the VPT scale ($p=0.039$) as well as in the anxiety levels of the male and female operators ($p=0.005$) (Table 2)

Statistically significant correlation was found between the VPT and FIS scale ($p=0.034$). Dental anxiety of the operators showed statistically significant correlation with the FIS ($p=0.040$) and VPT ($p=0.002$) scale. (Table 3)

DISCUSSION:

Dental anxiety is considered a universal phenomenon.^[17] The most likely responses to dental stimuli in case of children reporting for first dental visit would be either fear or anxiety.^[18] Anxiety is associated with short-and-long-term impairment in social, academic, familial, and psychological functioning. The children of parents with anxiety disorders are more likely to develop anxiety disorders themselves, because of genetic factors and the atmosphere in which they are raised. Most children experience anxiety purely on the basis of psychological, social and environmental influences and parents face special challenges because children with anxiety tend to be nervous, avoidant, annoying or exhausting. The feeling of anxiety is generally characterized as diffuse, unpleasant, a sense of apprehension or worry, and has

physical symptoms that may include headache, muscle tension, perspiration, restlessness, tension in the chest and mild stomach discomfort. Childhood is the best age to see the factors that influence general fears and anxiety with dental anxiety. Children of older age group may give a different result as they have lot of confluencing factors like maternal and peer influence.^[19]

The prevalence of dental anxiety among children between 5-10 years of age in a study population in India was found to be 6.3%.^[20] Dental anxiety has shown to affect approximately 9% of children and adolescents in Europe and in countries such as Australia, Canada, and the US.^[21] A wide range of instruments have been developed to measure dental anxiety and fear. Many studies have evaluated dental anxiety levels in children.^[2,22-26] However, it is difficult to measure the anxiety levels of children. In an effort to more accurately assess anxiety levels in children, dentists typically utilize scales, which are particularly designed for use with children. These scales can quickly provide feedback on children's anxiety levels prior to treatment. Nevertheless, the dental anxiety level is difficult to measure because it is a subjective issue that differs among individuals. Similar to the present study, many studies have used facial images to assess feelings in pediatric patient groups.^[27]

The child is shown some pictures and is then asked to choose the picture that best reflects his/her feelings at that moment. The verbal skills of children in this age

group are often quite limited; therefore, we used FIS and VPT, which are based on facial images and have proven to be valid instruments in many studies.^[27] VPT and FIS were administered before treatment in this study as they are picture scales and young children can easily correlate with these scales and anxiety levels in children can be easily measured.

A statistically significant positive correlation was observed between the FIS and VPT scores in the present study which is in conjunction with the study conducted by Klinic et al(2016),^[27] Buchanan and Niven(2002).^[15]

Given the significance of anxiety in the practice of dentistry, it is crucial that the practitioner is able to detect and assess the severity of anxiety among child patients with a valid method of measurement ^[15]. There has been a wide range of inventories proposed to identify and quantify dental anxiety in children. However, it is argued that no measure met all of the criteria identified as necessary for a child's dental anxiety instrument. There was no measure that provided satisfactory evidence of validity, was appropriate for use with very young children, or could be used by both clinicians and researchers. It is proposed, based on the findings of this study, that the FIS and VPT in some way encompasses all three criteria, this is summarised as follows:

The strong correlation between the FIS and VPT scores supports the validity of the FIS in the dental setting, i.e. the FIS measures what it intends to measure, state dental anxiety.

The FIS can be employed with very young children, this is not the case with other methods of verbal self-report for children, e.g. Children's Fear Survey Schedule – Dental Subscale. The FIS is quick and easy to administer in the dental waiting room. It takes a very short time (less than 1 min) to administer and the score is simply a reflection of the face chosen.^[15]

The VPT consist of eight cards with pictures of children in various dental situations. Two figures on each card, one in which a child appears happy and the other one in which he looks distressed.^[28]

Many studies have established a strong relationship between age and dental anxiety levels. In fact, these studies reported that children in young age groups are typically more anxious than older children, which is consistent with our findings. The relationship between age and dental anxiety levels is inversely proportional.^[27]

Based on the gender of children, the mean anxiety scores based on the VPT and FIS scale were more in female children as compared to the male children. The results of this study are in conjunction with the results of the study conducted by Alvesolo I et al (1993).^[29] and Chellappah NK (1990).^[30] whereas it negates results of the studies conducted by Folyan et al(2003).^[31]

A statistically significant correlation is found between the anxiety levels of the children using VPT ($p=0.002$), FIS ($p=0.040$) and the dental operators which is in negation with

the study conducted by Peretz *et al*(2004) wherein they stated that students dental anxiety or their anxiety prior to treating a child may not be directly associated with the child's dental anxiety.

Patients' age and gender and family's educational status and socioeconomic level are factors that can affect dental anxiety levels. Every attempt should be taken to relieve children's anxiety and to comfort them while at the dental clinic. The dentist's knowledge about the anxiety levels of a child and his/her mother before treatment will help the dentist prepare for reactions that can occur with any given anxiety level and will allow the dentist to take precautions to reduce a child's anxiety level if necessary.

Our study has some limitations. It was carried out in a university environment with small sample size and included only dental students. Children in the study were unaware of the type of treatment to be given. Response bias and social desirability bias of the children while answering for the picture test as well of the dental students while answering the questionnaire were not considered. A larger study of the interrelation between dentists and

paediatric dental patients is needed to better understand the possible associations between dentists' emotions and those of paediatric dental patients.

CONCLUSION:

Despite the limitations, the results of the study have some implications for paediatric and public health dentists. A positive correlation was found between the dental anxiety levels of the children and the dental operators which will help the operators to treat the children more effectively. Dental operators who have an awareness that children who are dentally anxious have a propensity for behavioral coping strategies will allow them to tailor their anxiolytic interventions to the emotional needs of the child. Dental coping strategies used by children seem to vary with age, dental anxiety and pain experience. This information can help dental practitioners to adjust his or her treatment to the child's emotional needs. Our findings give some insight into dental students and paediatric dental patients' dental anxiety. Furthermore, dental educators may appreciate another role of the dental school, that of being a desensitizer of dental students' dental anxiety.

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TABLES:**Table 1: Mean anxiety scores of children using VPT and FIS and**

Anxiety scales	Anxiety scores (Mean±SD)
Facial Image Scale	2.53± 1.01
Venham Picture Test	4.84± 1.10
Students dental anxiety	13.07± 2.85

Table 2: Comparison of mean dental anxiety scores in children with VPT and FIS.

Anxiety scales	Gender	Mean (SD)	<i>p</i> value
Facial Image Scale	Male	2.58±1.07	0.230
	Female	2.49±0.97	
Venham Picture Test	Male	4.93±0.92	0.039*
	Female	4.85±1.10	
Dental Operators anxiety	Male	13.16±2.78	0.005*
	Female	12.95±2.95	

(*p*<0.05 is significant)**Table 3: Correlation of dental anxiety of children and dental students**

	VPT		FIS		Dental anxiety of operator	
	<i>r</i> value	<i>p</i> value	<i>r</i> value	<i>p</i> value	<i>r</i> value	<i>p</i> value
VPT	1	-	0.674	0.034*	0.789	0.002*
FIS	0.674	0.034*	1	-	0.542	0.040*
Dental Anxiety of operator	0.789	0.002*	0.542	0.040*	1	-

(*p*<0.05 is significant)