

Correlation of general anxiety and dental anxiety in children aged 3 to 5 years: A clinical survey

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ABSTRACT

Background: The aim of this study was to determine the prevalence of dental anxiety in a group of children aged 3 to 5 years and to explore the relationships between dental anxiety and general fearful nature of the child.

Materials & Methods: A total of 250 children were selected for the study after due selection via inclusion criteria. Pre-school anxiety scale by Spence and Rapee (1999) was used to assess the general fear of the child and was filled by the parent during the first visit. Venham's anxiety scale was used to assess the dental anxiety which was seen during routine dental examination of the child on his first visit.

Results: The results were statistically analyzed using Chi square test and Karl Pearson coefficient of correlation.

Conclusion: It was concluded that 24% of children showed association between high level of dental anxiety and high level of general fear; 56% of children also exhibited high level of dental anxiety with moderate score of general fear and 20% of children exhibited positive correlation between low level of dental anxiety and fear.

Key Words: Anxiety, pulse rate, spence and rapee scale, venham's anxiety scale.

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Introduction

In recent times the everyday clinical practice of dentistry has benefited from major advancements in techniques, technologies and materials, as well as in infection control procedures. Despite these gains, anxiety related to the dental environment and in specific to dental treatments in children is a problem suffered by many patients worldwide, and it remains a significant challenge in providing dental care. Hence it is of paramount importance for the pediatric dentist not only to identify an anxious child but also to manage him in a way which instills a positive attitude in him for dentistry.

Anxiety is an emotional state that helps normal individuals defend themselves against a variety of threats and dental anxiety refers to patient's specific response towards dental situation-associated stress.¹ Many terminologies have been used over a period of time to explain the concept of dental anxiety, dental fear, and dental phobia. Dental fear is usually associated with known stimuli like injections or drills whereas dental anxiety is borne out of an unknown threat that is not immediately present.

Dental anxiety is a multidimensional complex phenomenon, and no one single variable can account exclusively for its development. Within the literature,

there are a number of factors that have consistently been linked with a greater incidence of dental anxiety, including personality characteristics, fear of pain, past traumatic dental experiences, particularly in childhood (conditioning experiences), the influence of dentally anxious family members or peers which elicit fear in a person (vicarious learning), and blood injury fears.²

The prevalence of dental anxiety is 5-20 % in most of the populations which is seen more in children and this tends to decrease as age advances.^{3,4} It is also seen that females are more prone to dental anxiety as compared to their male counterparts.³ The relation of dental anxiety with the incidence of caries is well documented thus signifying their avoidance for dental visits.⁵

Dental anxiety is mostly initiated during childhood so in order to prevent it the dentist must first understand its occurrence. Although a lot of research has been done exploring the relationship of pediatric dental anxiety with parameters like oral health status, age, socio-economic status, parental presence, but very little emphasis has been laid on the relation of pediatric dental anxiety with general fears of child. The objective of this study was to evaluate the relationship between general fear and dental anxiety in children aged 3-5 year old who were visiting the dental setup for the first time.

Material and Methods

The study was carried out among children who reported to the Out Patient Department of Mahatma Gandhi Dental College & Hospital for the first time. A total of 250 children (male and female) aged between 3-5 years of age were selected for the study based on the following inclusion and exclusion criteria.

Inclusion Criteria:

- Healthy subjects without a current or past history of major medical illness.
- Reporting for the first time for dental treatment
- Accompanied by either parent
- Should be physically and mentally in accordance with the chronological age.

Exclusion Criteria:

- Past history of major illness including any disability.
- Child has undergone dental treatment previously or has visited a dentist.
- Parents who do not consent.

For the measurement of general anxiety, Preschool Anxiety Scale (PAS) given by Susan H. Spence and Ronald Rapee (1999)⁶ was filled by the parents on behalf of the children. For measuring the dental anxiety Venham's anxiety scale⁷ was used in children and pulse oximeter was used to measure the pulse rate as a physiologic indicator of the anxiety.

On the reporting of child to the OPD of Pediatric and Preventive Dentistry Department, the parent was first explained the procedure and informed consent was taken. After this the parent was made to sit in a comfortable environment and asked to fill Preschool Anxiety Scale (PAS) form (Table 1) while the child was allowed to play in the play-area. At this time a pulse-oximeter was used to evaluate the pulse of the child. After completion of the form the parent accompanied the child to the dental setup where the child was examined and evaluated. During this evaluation the pulse rate was again recorded and the anxiety of the child was also evaluated using the Venham's anxiety scale (Table 2).

Results

A total of 250 children (male and female) aged between 3-5 (mean age-3.99 yrs) were selected for the study. General anxiety score was ascertained by the parents themselves through the questionnaire provided to them. Average anxiety score of all the children was found to be 76.29.

The children were divided into three groups viz. **mild** Group 1 (score 28-52), **moderate** Group 2 (score 53-82) and severe Group 3 (score 83-102) on the basis of the general anxiety score. Of the total 250 children 40 children were reported as children with mild anxiety, 82 with moderate and 102 with severe anxiety levels. Mean general anxiety score in the given samples was found to be 70.64.

Dental anxiety was ascertained by Venham's anxiety scale. In this parameter the children were again divided into three groups viz. **cooperative** (0-1), **tense-cooperative** (2-3) and **uncooperative** (4-5). Of the total

Table 1: Preschool Anxiety Scale

Your Name: Date: _____
 Your Child's Name:

Below is a list of items that describe children. For each item please circle the response that best describes your child. Please circle the 4 if the item is very often true, 3 if the item is quite often true, 2 if the item is sometimes true, 1 if the item is seldom true or if it is not true at all circle the 0. Please answer all the items as well as you can, even if some do not seem to apply to your child.

		Not True at All	Seldom True	Sometimes True	Quite Often True	Very Often True
1	Has difficulty stopping him/herself from worrying.....	0	1	2	3	4
2	Worries that he/she will do something to look stupid in front of other people.....	0	1	2	3	4
3	Keeps checking that he/she has done things right (e.g.,that he/she closed a door, turned off a tap).....	0	1	2	3	4
4	Is tense, restless or irritable due to worrying.....	0	1	2	3	4
5	Is scared to ask an adult for help (e.g. a preschool or school teacher).....	0	1	2	3	4
6	Is reluctant to go to sleep without you or to sleep away from home.....	0	1	2	3	4
7	Is scared of heights(high places).....	0	1	2	3	4
8	Has trouble sleeping due to worrying.....	0	1	2	3	4
9	Washes his/her hands over and over many times each day.....	0	1	2	3	4
10	Is afraid of crowded or closed-in places.....	0	1	2	3	4
11	Is afraid of meeting or talking to unfamiliar people.....	0	1	2	3	4
12	Worries that something bad will happen to his/her parents.....	0	1	2	3	4
13	Is scared of thunder storms.....	0	1	2	3	4
14	Spends a large part of each day worrying about various things.....	0	1	2	3	4
15	Is afraid of talking in front of the class(preschool group) e.g. show and tell	0	1	2	3	4
16	Worries that something bad might happen to him/her e.g. getting lost or kidnapped), so he/she won't be able to see you again.....	0	1	2	3	4
17	Is nervous of going swimming.....	0	1	2	3	4
18	Has to have things in exactly the right order or position to stop bad things from happening.....	0	1	2	3	4
19	Worries that he/she will do something embarrassing in front of other people.....	0	1	2	3	4
20	Is afraid of insects and/or spiders.....	0	1	2	3	4
21	Has bad or silly thoughts or images that keep coming back over and over	0	1	2	3	4
22	Becomes distressed about your leaving him/her at preschool/school or with a babysitter.....	0	1	2	3	4
23	Is afraid to go up to group of children and join their activities.....	0	1	2	3	4
24	Is frightened of dogs.....	0	1	2	3	4
25	Has nightmares about being apart from you.....	0	1	2	3	4
26	Is afraid of the dark.....	0	1	2	3	4
27	Has to keep thinking special thoughts(e.g. numbers or words) to stop bad things from happening.....	0	1	2	3	4
28	Asks for reassurance when it doesn't seem necessary.....	0	1	2	3	4
29	Has your child ever experienced anything really bad or traumatic (e.g. severe accident, death of a family member/friend, assault, robbery, disaster)	YES	NO			
	Please briefly describe the event that your child experienced					
	If you answered NO to question 29, please do not answer questions 30-34, if you answered YES, please do answer the following questions.					
	Do the following statements describe your child's behavior since the event?					
30	Has bad dreams or nightmares about the event.....	0	1	2	3	4
31	Remembers the event and becomes distressed.....	0	1	2	3	4
32	Becomes distressed when reminded of the event.....	0	1	2	3	4
33	Suddenly behaves as if he/she is reliving the bad experience.....	0	1	2	3	4
34	Shows bodily signs of fear (e.g. sweating, shaking or racing heart) when reminded of the event.....	0	1	2	3	4

Scoring: The responses are scored:

Not True at All = 0 Seldom True = 1 Sometimes True = 2 Quite Often True = 3 Very Often True = 4
 This yields a maximum possible score of 112

The sub-scale scores are computed by adding the individual item scores on the set of items as follows:

Subscale Scoring	Items (sum of ratings)
Generalized Anxiety	1 + 4 + 8 + 14 + 28
Social Anxiety	2 + 5 + 11 + 15 + 19 + 23
Obsessive Compulsive disorder	3 + 9 + 18 + 21 + 27
Physical Injury Fears	7 + 10 + 13 + 17 + 20 + 24 + 26
Separation Anxiety	6 + 12 + 16 + 22 + 25
Total Score	Sum of Scores for Items 1 to 28

children, 45 children were found to be cooperative, 131 tense-cooperative and 102 as uncooperative.

The results are summarized in Table 3:

Chi square test was used to examine the association between the variables. In comparison of Group 1

($P > 0.05$), or between cooperative and uncooperative group (**chi square value=0.71, $P > 0.05$**) or between tense and uncooperative group (**chi square value=0.447, $P > 0.05$**).

In comparison of Group 2 (moderate) and Group 3

Venham's Anxiety rating scale	
Rating	Features
0	Relaxed, smiling, willing and able to converse
1	Uneasy, concerned. During stressful procedure may protest briefly and quietly to indicate discomfort. Hands remain down or partially raised to signal discomfort. Child willing and able to interpret experience as requested. Tense facial expression, may have tears in eyes.
2	Child appears scared. Tone of voice, questions and answers reflect anxiety. During stressful procedure, verbal protest, (quiet) crying, hands tense and raised, (not interfering much -- may touch dentist's hand or instrument, but not pull at it). Child interprets situation with reasonable accuracy and continues to work to cope with his/her anxiety
3	Shows reluctance to enter situation, difficulty in correctly assessing situational threat. Pronounced verbal protest, crying. Using hands to try to stop procedure. Protest out of proportion to threat. Copes with situation with great reluctance.
4	Anxiety interferes with ability to assess situation. General crying not related to treatment. More prominent body movement. Child can be reached through verbal communication, and eventually with reluctance and great effort he or she begins the work of coping with the threat.
5	Child out of contact with the reality of the threat. General loud crying, unable to listen to verbal communication makes no effort to cope with threat. Actively involved in escape behavior. Physical restraint required.

	Cooperative	Tense	Uncooperative	Total
Mild	4	27	9	40
Moderate	20	44	38	102
Severe	21	60	27	108
Total	45	131	74	250

(mild) and Group 2 (moderate) no statistically significant differences were observed between cooperative and tense cooperative group (**chi square value = 3.72, $P > 0.05$**), or cooperative and uncooperative group (**chi square value = 0.065, $P > 0.05$**) but statistically significant differences were found between tense cooperative and uncooperative group (**chi square value = 4.75, $P < 0.05$**)

In Group 1 (mild) and Group 3 (severe) no statistically significant differences were observed between cooperative and tense group (**chi square value=2.19,**

(severe) and no statistically significant differences were observed in the between cooperative and tense (**chi square value=0.50, $P > 0.05$**), or between cooperative and uncooperative (**chi square value=0.95, $P > 0.05$**) but statistically significant differences were found between tense uncooperative group (**chi square value=4.17, $P < 0.05$**)

Karl Pearson coefficient of correlation was used to determine the correlation between general anxiety, dental anxiety and pulse rate of all the samples. No statistically significant correlation was found between

general anxiety and dental anxiety ($t=0.8037, P>0.05$) and general anxiety and pulse rate. ($t=0.785, P>0.05$), but highly significant positive correlation was found between dental anxiety and pulse rate ($t=4.50, P<0.001$).

anxiety are summarized below⁸: (Figure 1)
The sample selected for this study were aged between 3-5 years as this is the time the child will have the initiation of anxiety so to co-relate the presence of

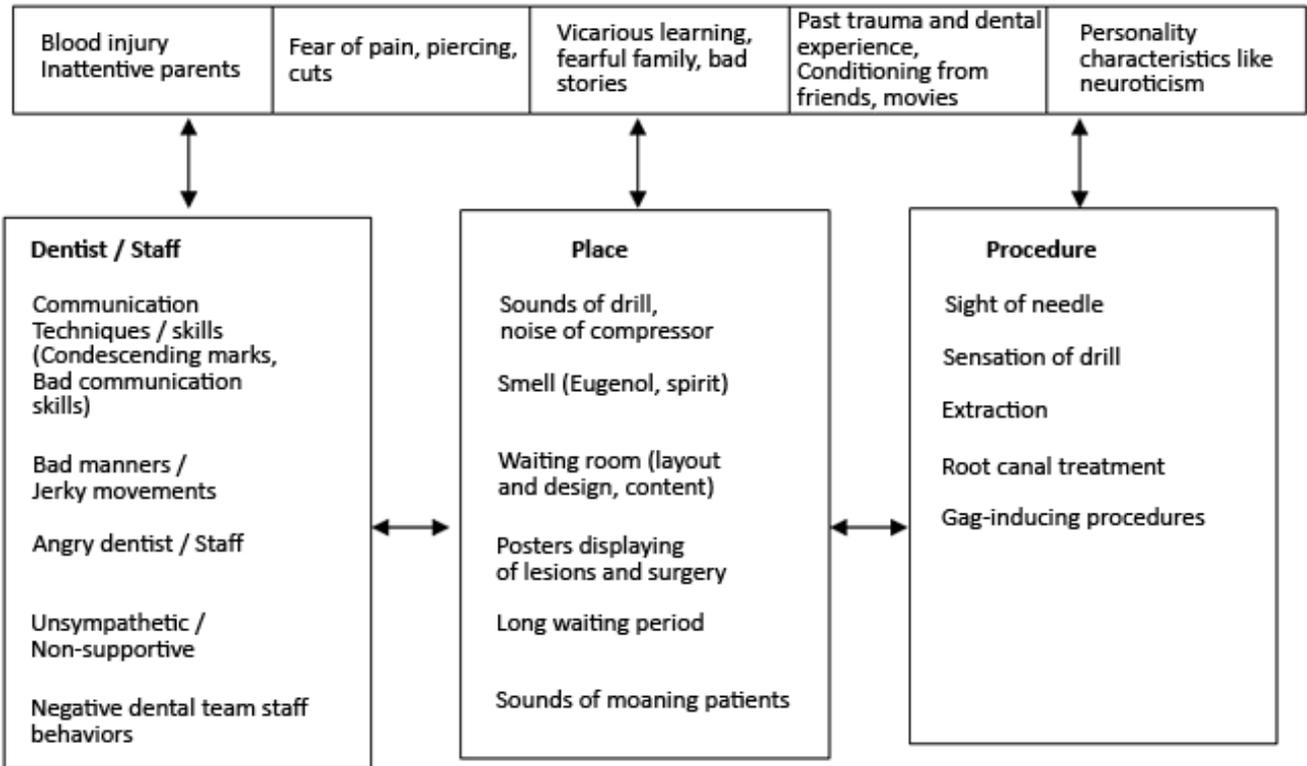


Figure 1: Interactions, which lead to and modify dental anxiety.

Discussion

The most likely responses to dental stimuli in case of children reporting for first dental visit would be either fear or anxiety. 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. Some of the factors that influence

general fears and anxiety with dental anxiety this is the best age. Children of older age group may give a different result as they have lot of confluent factors like maternal and peer influence.^{9,10} As children aged 3-5 have not yet attained social independence the chance of influence of environmental factors is also limited.^{11,12} In our study we have used three parameters to study the correlation. The generalized fears and anxiety was evaluated using Preschool Anxiety Scale (PAS) given by Susan H. Spence and Ronald Rapee (1999).⁶ This is a 28 point test which is filled by the parent depicting the fears and anxiety of the child (Table 1 for calculation of this score). The reliability and validity of this test has been well documented.⁶ The main advantage of this test are that firstly we get to know the real anxiety status from parents who answer the questions based on their observation of the child since birth and secondly this test also will help us correlate different types of anxiety with dental anxiety.

The second assessment parameter used in the study was to measure the dental anxiety level of the child while he was being dentally evaluated. We have used Venham's anxiety scale as it is one of the most reliable indicators of dental anxiety.^{7,13} Venham's anxiety scale has 6 divisions (0-5), depicting the level of anxiety of child and explaining the most likely behavior pattern (Table 2). The advantage of this scale is not only its clarity and reliability but also its ease of recording.^{7,13,14} The main advantage of Venham's scale over Corah's dental anxiety scale¹⁵ (one of the most popular scales used for anxiety evaluation in dental setting) is that since the age group we are using is between 3-5 Years they would not be in a position to answer the Corah's questionnaire. So by using Venham's anxiety scale we will also come to know the dentist anxiety rating of child.

The evaluation of anxiety is most comprehensive when done with both physiological and behavioral indexes for 3-5-year old children, hence we have used pre-school anxiety scale for parents behavioral judgment, Venham's anxiety scale for dentists assessment of child's behavior and physiologic parameters have been evaluated by the pulse rate of the patients.^{7,16}

The results of comparison of general anxiety with dental anxiety were confluent with earlier studies and emphasized that those children that were found to be moderate or severely anxious in daily routine were also tensed during dental evaluation and exhibited significant dental anxiety.

Conclusion

This study concluded that the positive correlation of general anxiety with dental anxiety and signifies that although dental anxiety can be seen in any child there is more probability of dental anxiety in children who are generally more anxious.

Dental anxiety is a multidimensional complex phenomenon which is influenced by personality characteristics, fear of pain, past traumatic dental experiences in childhood, and dentally anxious family members or peers. Helping highly anxious patients to overcome their fear of dental treatment is a challenge, however if achieved it will result in improvement in their oral health and in their overall quality of life and wellbeing.

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