



Original Research Article

A comparative evaluation of role of gender, age and socioeconomic status on perceived dental anxiety of 4-8 years old children using two scales

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ABSTRACT

Introduction: Dental anxiety is a common problem that affects people of all ages and appears to develop mostly in childhood and adolescence. Dental anxiety in children has been recognized as a problem in patient management for many years. It is important that dentists are able to assess dental anxiety in child patients as early as possible so that they may identify patients who are in special need with regards to their fear. Age, gender and socioeconomic status play an important role as determining factors in dental anxiety, hence should be considered while measuring dental anxiety.

Materials and Methods: A randomized control study was conducted in 4 to 8 years old children using two scales. A list of children from 14 schools in Gautam Budh Nagar district (U.P.) was collected and 1025 children were randomly selected. The children were asked about how they feel when they visit a dentist, by VPT and FIS separately their role with gender, age and socioeconomic was evaluated.

Aim: To do comparative evaluation of role of gender, age and socioeconomic status on perceived dental anxiety of 4 to 8 years old children using two scales.

Results: Among 1025 children, 532(51.9%) were males and 493 (48.1%) were females. Age wise comparison of both scales score revealed that mean FIS score was statistically significant and higher than mean VPT scale among 7 and 8 year age groups. Among 4, 5 and 6 year age group, no statistically significant difference was found between two scales.

Conclusion: Dental anxiety is found to increase with increasing age. Females had a similar level of anxiety as compared to males and Children from low SES had a high level of dental anxiety than children from high SES.

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1. Introduction

Anxiety is defined as a non specific feeling of apprehension, worry, uneasiness or dread, the source of which may be vague or unknown. Child dental anxiety has been a matter of concern for many years because of various handicapping complications associated with it like prolonged chair side time, behavior management problems, and avoidance of dental care.¹ Reported prevalence of dental anxiety among children and adolescents in different countries ranged from 5 to 33%.²

Dental anxiety may even originate from lack of dental environment at all. Dental anxiety is defined as “an abnormal fear or dread of visiting the dentist for preventive care or therapy and unwanted anxiety over dental procedures” and may have psychological, cognitive and behavioral consequence. Anxious people tend to overestimate pain and discomfort caused by dental treatment and may also postpone or miss appointments, with negative consequences for their oral health and often having to incur more complex interventions, thereby entering a vicious cycle that tends to intensify anxiety with regard to treatment.³

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Dental anxiety is a common problem that affects people of all ages and appears to develop mostly in childhood and adolescence. Childhood dental anxiety is not only distressing for the child and family but is also associated with poor oral health outcomes and an increased reliance on costly specialist dental services.³ Dental anxiety in children has been recognized as a problem in patient management for many years. Furthermore, the effects of this anxiety have been shown to persist into adulthood, which can often lead to dental avoidance and subsequent deterioration of oral health. It is important that dentists are able to assess dental anxiety in child patients as early as possible so that they may identify patients who are in special need with regards to their fear. For this purpose, assessment measures is essential.⁴

The assessment of dental anxiety has led to the development of a variety of measures, and several skills have been designed to quantify dental anxiety.⁵ 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.⁴ The ideal measure should be valid, allow for limited cognitive and linguistic skills, and be easy to administer and score in a clinical context. In order to cover all of these criteria the most obvious choice would be to employ a picture scale that should be easier for very young children to understand like Venham picture test (VPT) and Facial image scale (FIS).⁴

Various patterns to evaluate the anxiety in children are studied and factors such as age of the child, gender, number of dental visits, oral hygiene habits, and socioeconomic status.⁶ Assessment of dental anxiety in children thus becomes very important and in leu of paucity of data available viz a viz affect of gender, age and socioeconomic status on perceive dental anxiety in a non dental environment in 4-8 years old children. Hence this study was undertaken for the comparative evaluation of gender, age and socioeconomic status on perceived dental anxiety of 4 to 8 years old children using VPT and FIS.

2. Materials and Methods

A randomized control study was conducted to evaluate and compare the role of gender, age and socioeconomic status on perceived dental anxiety of 4 to 8 years old children using two scales. A list of children from 14 schools representing 4 blocks of Gautam Budh Nagar district (U.P.) was collected and 1025 children aged between 4 to 8 years were randomly selected. Out of 1025 children, 532 were males and 493 were females. School going children with no previous dental visit were included and children who were not willing or uncooperative children or with presence of any systemic disease observed by taking medical history were excluded.

The study was reviewed by the institutional ethical committee of School of Dental Sciences, Sharda University and clearance was obtained for the same. Consent was

taken from the basic district administrator of Gautam Budh Nagar district. Consent form was obtained from the school principals and a letter of invitation/project information statement stating the objective of the study was issued with the school principals.

Socioeconomic status (SES) along with parent's consent was determined by Kuppuswamy's socio-economic status scale for 2014.⁷ Calibration and training of examiner was done. Full agreement was reached between the study examiner and two experienced senior faculty members in the Department of Pediatric and preventive dentistry, School of Dental Sciences, Sharda University. The children were asked about how they feel when they visit a dentist, by VPT and FIS separately. The FIS comprises a row of five faces ranging from very happy to very unhappy. The children were asked to point at which face they felt most like at that moment. The scoring was done from 1 to 5.(Figure 1) The VPT comprises of eight cards, with two figures on each card, one 'anxious' figure and one 'nonanxious' figure. The children were asked to point at the figure they felt most like at that moment. If the child pointed at the 'anxious' figure a score of one was recorder, if the child pointed at the 'nonanxious' figure a score of zero was recorded. The number of times the 'anxious' figure was chosen the totaled to give a final score (minimum score, zero; maximum score, eight).(Figure 1) Data was entered into Microsoft Excel spreadsheet and then analyzed using Statistical Package for Social Sciences (SPSS) version 21. The test used in the study for statistical analysis were Chi square test, Post hoc pairwise comparison by boneferroni test, One way Analysis of Variance test, Independent student's t test and Paired Student's t test. The level of statistical significance was set at 0.05.

3. Results

Among 1025 children, 142 (13.9%) were of 4 year age, 195 (19%) were of 5 year age, 186 (18.1%) were of 6 year age, 189 (18.4%) were of 7 year age and 313 (30.5%) were of 8 year age. 532(51.9%) were males and 493 (48.1%) were females. Table 1 shows agewise and genderwise distribution of study population.

Table 2 shows agewise comparison of FIS score. Overall mean (SD) scale score of study population was found to be 2.37 (± 1.29). Agewise distribution of scale score showed that mean (SD) scales score was 2.75(± 1.29) among 4 year age group = 2.63(± 1.40) among 5 year age group, 2.42(± 1.22) among 6 year age group, 2.13(± 1.21) among 7 year age group, 2.14(± 1.23) among 8 year age group.(Figure 1) Agewise comparison of means scale scores showed that mean scores of 4 and 5 year age group was significantly higher than that of 7 and 8 year age groups. The mean scale score of 6 year age group was not significantly different from other age group.

Table 3 shows genderwise and SES comparisons of FIS score. Genderwise comparison of scale scores showed that mean (SD) scale scores of males and females were 2.37(\pm 1.29) and 2.36(\pm 1.29) respectively. The difference was not statistically significant. SES comparison of scale scores showed that Mean (SD) scale scores of low SES and high SES were 2.70(\pm 1.15) and 2.05(\pm 1.33) respectively.(Figures 1 and 2) Mean score low SES children was found to be statistically significant and higher than that of high SES children.

Table 4 shows agewise comparison of VPT score. Overall mean (SD) scale score of study population was found to be 2.23(\pm 1.64). Agewise distribution of scale score showed that Mean (SD) scale score was 2.96(\pm 1.53) among 4 year age group, 2.66(\pm 1.74) among 5 year age group, 2.36(\pm 1.59) among 6 year age group, 1.72(\pm 1.46) among 7 year age group, 1.84(\pm 1.56) among 8 year age group.(Figure 3) Agewise comparison of mean scale scores showed that mean scores of 4 year age group was significantly higher than that of 5 and 6 year age groups that was further significantly higher than that of 7 and 8 year age group. The mean scale score 4 year and 5 year age group was not significantly different. Similarly, mean scale score 7 year and 8 year age group was also not significantly different.

Table 5 shows genderwise and SES comparisons of VPT score. Genderwise comparison of scale score showed that mean (SD) scales score of males and females were 2.22(\pm 1.62) and 2.24 (\pm 1.66) respectively. There was no statistically significant difference between mean scale scores of male and females. Socioeconomic stauswise comparison of scale score showed that mean (SD) scales score of low SES and high SES were 2.73(\pm 1.65) and 1.75(\pm 1.48) respectively.(Figures 1 and 2) Mean scores of low SES children was found to be statistically significant and higher than that of high SES children.

Table 6 shows agewise comparison of anxiety. Overall mean VPT scale scores were significantly higher than mean FIS score. Agewise comparison of both scales score revealed that mean FIS score was statistically significant and higher than mean VPT scale among 7 and 8 year age groups.(Figure 3) Among 4, 5 and 6 year age group, no statistically significant difference was found between two scales.

4. Discussion

The psychophysiological responses produced by anxiety are associated in general with an increase in the activity of the sympathetic branch of the autonomic nervous system. Disturbances to the hypothalamic-pituitary-adrenal axis can also occur during episodes of dental anxiety. Situations of pain and stress lead to an increase in the activity of this system, which results in increased secretions of cortisol.⁷

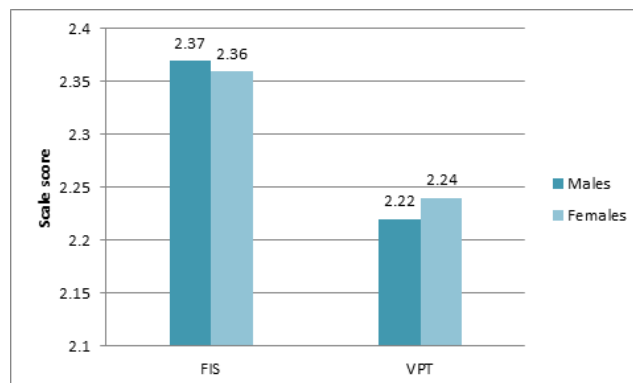


Fig. 1: Shows genderwise comparison of anxiety

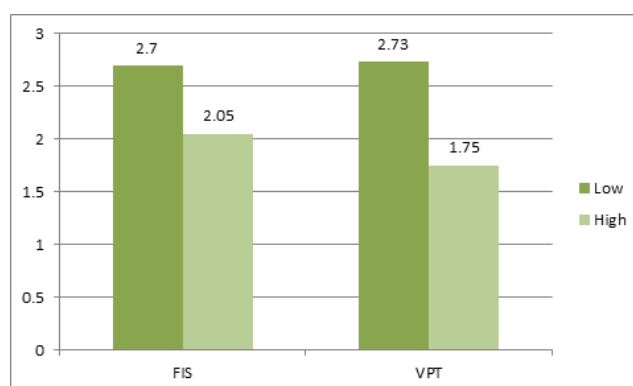


Fig. 2: Shows SES wise comparison of anxiety

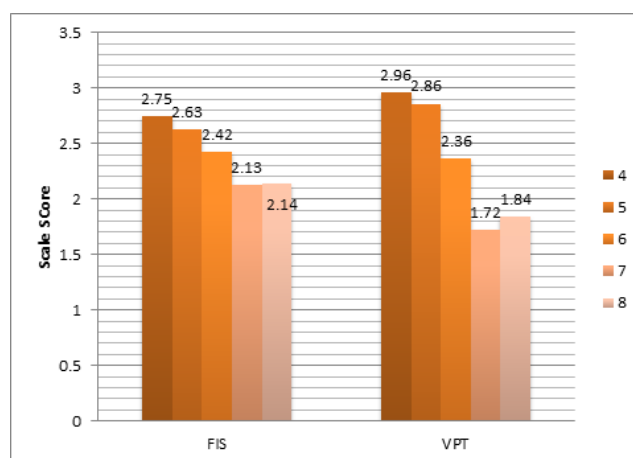


Fig. 3: Shows agewise comparison of anxiety

Table 1: Agewise and genderwise distribution of study population

Age group	Males		Females		Total
		%		%	
4 years	74	52.1	68	47.9	142
5 years	100	51.3	95	48.7	195
6 years	98	52.7	88	47.3	186
7 years	94	49.7	95	50.3	189
8 years	166	53	147	47	313
P value					0.988

Chi square test

Table 2: Agewise comparison of FIS scores

Age	Scale scores		P value	Post hoc pairwise comparison by boneferroni test
	Mean	SD		
4 years	2.75	1.29	<0.001,s	a,b>d,e
5 years	2.63	1.40		
6 years	2.42	1.22		
7 years	2.13	1.21		
8 years	2.14	1.23		
	2.37	1.29		

One way analysis of Variance test

Table 3: Genderwise and SES wise comparison of FIS score

		Scale scores		P value
		Mean	SD	
Gender	Males	2.37	1.29	0.910, NS
	Females	2.36	1.29	
SES	Low	2.70	1.15	<0.001,S
	High	2.05	1.33	

Independent student's t test

Table 4: Agewise comparison of VPT scores

Age	Scale scores		P value	Post hoc pairwise comparison by boneferroni test
	Mean	SD		
4 years	2.96	1.53	<0.001,s	b,c >d,e
5 years	2.86	1.74		
6 years	2.36	1.59		
7 years	1.72	1.46		
8 years	1.84	1.56		
Total	2.23	1.64		

One way analysis of variance test

Table 5: Genderwise and SES wise comparison of VPT scores

		Scale scores		P value
		Mean	SD	
Gender	Males	2.22	1.62	0.837, NS
	Females	2.24	1.66	
SES	Low	2.73	1.65	<0.001,S
	High	1.75	1.48	

Independent student's t test

Table 6: Agewise comparison of anxiety

Age	FIS scores		VPT scale scores		P value
	Mean	SD	Mean	SD	
4 years	2.75	1.29	2.96	1.53	0.076,NS
5 years	2.63	1.40	2.66	1.74	0.784,NS
6 years	2.42	1.22	2.36	1.59	0.561,NS
7 years	2.12	1.21	1.72	1.46	<0.001,S
8 years	2.14	1.23	1.84	1.56	<0.001,S
Total	2.37	1.29	2.23	1.64	0.002,S

Paired Student's t test

The difference in anxiety between different age groups can be viewed from two different aspects. One is the psychoanalytical aspect and the other is the physiological aspect. This study is conducted for the assessment of psychological aspect of anxiety.⁸

For the assessment of dental anxiety, formal assessment measures are essential. When considering the usefulness of an assessment measure, however, there are essentially three important factors to take into account that it should be valid, appropriate for use with children and assessment measure should be of practical use to the dental practitioner.⁴

Self-report questionnaires, conversely, are easier to employ in the clinical setting; potential problems may still exist, however, as measures differ significantly in terms of administration, scoring and interpretation. The ideal measure should be valid, allow for limited cognitive and linguistic skills, and be easy to administer and score in a clinical context in order to cover all of these criteria the most obvious choice would be to employ a picture scale.⁴

Common scales are used for measuring dental anxiety are such as Corah dental anxiety scale [CDAS], Modified Corah dental anxiety scale [MCDAS], Modified Child dental anxiety scale faces version [MCDAS f], Venham picture test [VPT], Anxiety rating scale etc.^{9–13}

Dental anxiety in children, which affects a child's behavior, has been recognized as a source of problem in patient management for many years. Given the significance of anxiety in the practice of dentistry, it is crucial that the practitioner is able to detect and access the severity of anxiety among child patient with a valid method of measurement.⁴

Hence the present study was undertaken for the comparative evaluation of role of gender, age and socioeconomic status on perceived dental anxiety of 4–8yr of children. In present study. FIS and VPT were used as they are easy to understand and to be used with young children.

According to Buchanan et al., an ideal anxiety assessment scale should be short in length to maximize the response from the children and minimize the time for its administration, include items which are most relevant to the child's dental experience, easily grab the attention of the child, allow for limited cognitive and linguistic skills, simple to score and interpret. The VPT and FIS are picture

scales that are intended for young children to measure the state of anxiety.⁴

There is a high correlation between validity and test score of VPT and FIS according to Buchanan and Niven in 2002. The advantage of VPT and FIS is relatively easy to administer and score although the test does have some limitation. FIS is quick and easy to administer. FIS can be employed with very young children.⁴

Dentists have had some difficulty in identifying the stimuli that lead to dental anxiety in the dental office. It is accepted that the etiology of dental Anxiety is a problem made up of number of different components such as gender, age and socioeconomic status.

When the role of gender on dental anxiety is analyzed some research reports as by Assuncao CM et al. and several other studies^{14–17} reported no gender differences, while other studies^{18–21} have shown that girls report higher anxiety.

The present study showed that females had a similar level of anxiety as compared to males. No specific gender predilection was seen with both scales. Genderwise comparison of both scale scores revealed that among males, the mean score of FIS (2.37) was significantly higher than mean scale score of VPT (2.22) among females, there was no statistically significant difference between two scales scores like 2.36 for FIS and 2.23 for VPT.

Several studies have implicated that relationship between age and dental anxiety as a decrease in dental anxiety with increasing age as Dogan MC et al¹⁴ and similar results have been given by studies done by other authors.^{18,22}

Raadall M et al²³ has shown that, among children with good oral health, young children were twice as likely to be fearful of the dentist than older children, but that among children with poor oral health, the amount of fear is similar for younger and older children. Coric A et al²⁴ reported no effect of age on children's anxiety. The present study demonstrated that anxiety decreased as age increased. Dental anxiety was seen decreasing as age increased with both FIS and VPT. Agewise comparison of both scales scores reveal that mean scale score for 7 to 8 yrs was significantly higher for FIS (2.12 and 2.14) than mean scale for VPT (1.72 and 1.84). Among 4, 5 and 6 years age groups, no statistically significance difference were

found between two scales. Dental anxiety decreased with increasing age probably due to awareness in children of older age group.

Coric A et al²⁴ said that there is no relationship of SES with dental anxiety. Alaki S et al¹⁹ reported that children in public schools show more severe anxiety than those in private schools. Dogan MC et al¹⁴ and Raadall M et al²³ said that children from low SES were found to be more anxious than children of high SES. The present study showed that children from low SES had a high level of dental anxiety as compared to children from high SES. SES comparison of both scales scores revealed that among high SES, the mean score of FIS was significantly higher than mean scale score of VPT. Among low SES there was no statistically significant difference between two scales scores for both scales the dental anxiety was found to be higher for low SES which might be explained due to subjective fear being transferred from parents to their children due to lack of their awareness.

Agarwal M et al¹⁰ have shown that previous dental exposure did not have significant influence on VPT score on school children. Dogan MC et al.¹⁴ had eliminated children with previous dental experience as they wanted to investigate those fears and anxieties that arise from modeling or exposure to threatening information. In the present study, the children with previous dental experiences are not influenced. Studies done in school environment are helpful in finding out the perceived dental anxiety of children as the children once enter the dental clinic already or already anxious, whereas if at school, can relate their anxiety irrespective of any influence from their parents and are free of objective fear which they get once they enter the dental clinic or are waiting in the waiting area of a dental clinic.

The fact is supported by the studies done in school environment as done by Agrawal M et al and other studies.^{14,19,25} Present study was conducted in a school environment. Dental anxiety severely comprises 'oral health' since it has been found to have impact on social and psychological wellbeing. In recent times the everyday clinical practice of dentistry has been benefited from major advancements in techniques, technologies and materials, as well as infection control procedures.²⁶

Despite these gains, anxiety related to the dental environment and in specific to dental treatment 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 who instills a positive attitude in him for dentistry.²⁷

Dental anxiety in a child patient is an important aspect in relation to the oral and general health of the child patient. Most of the dentists neglect these situations, which leads to the adverse effect on the children for the future

dental treatment. Therefore it is important to understand the anxiety in a child and manage accordingly, which is important for the future health of one's life.²⁸

5. Conclusion

Dental anxiety is found to increase with increasing age. Females had a similar level of anxiety as compared to males and Children from low SES had a high level of dental anxiety than children from high SES. Dental education for children should be started at early ages so that children would not develop negative relationship towards dental procedures, and to deliver a good dental care. The prevalence of dental anxiety should not be neglected in clinical practice, especially in pediatric dentistry

6. Source of Funding

None.

7. Conflict of Interest

None.

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