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EVALUATION OF DENTAL ANXIETY USING NAYANLATA SAXENA'S MODIFIED FACIAL SCALE – MCDASfNS IN SCHOOL GOING CHILDREN FROM BHOPAL – A CROSS-SECTIONAL STUDY

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Abstract:

Background: Dental fear and anxiety is common across the lifespan and represents a barrier to proper oral health behaviours and outcomes. Dental anxiety is a common problem that can lead to adverse conditions in dentists and patients. Children's dental anxiety is the cause for the rise in dental health issues, as patients avoid seeking treatment. Improving children's oral health and dental experiences begins with addressing their dental anxiety as children. The aim of our study is to assess dental anxiety using a modified version of MCDASf scale and corroborate it with their oral health status.

Methodology: The study included 477 children between the age of 8-11 year from South Bhopal. A self-reported dental anxiety scale for children was developed based on MCDASf consisting of questions and perceptions of children towards dental treatment and their fear along with the cognitive questions.

Results: The mean anxiety value of government school children were 30.63 ± 4.16 and private school children were 33.76 ± 3.93 . The observed anxiety value of private school children were significantly higher than the government school children. Significant decrease in dental anxiety was observed with advancing age.

Conclusion: Reducing child's anxiety through remodeling of physical appearances and elicitation of appropriate responses through the desired questionnaire serves as a potential model for behavior management protocols. Our results showed decreasing anxiety with the advancing age.

Key Words: Dental Anxiety, Dental Fear, Dental Anxiety Survey, MCDASf, Bhopal.

I. INTRODUCTION

Dental anxiety can be identified as a vague, unpleasant feeling accompanied by a premonition that something terrible is about to happen, whereas dental fear seems to be the anticipation of a threat or harm evoked by an identifiable source.¹ Anxiety is defined as a state of fear or apprehension about what is to come. Anxiety arises from within, and the source may not be readily evident from the surrounding environment.^{2,3} Anxiety, including dental fear and anxiety, is an inherent characteristic that is not directly accessible to objective approaches of measurement.^{2,4} In order to lessen young patients' fear and anxiety prior and during the dental procedures, as well as to manage their behaviour, it is crucial to understand dental fear and anxiety in young patients. Children who are at ease and unafraid might act positively like grinning and chatting. On the other hand, fearful kids might act hesitantly or cautiously, and in severe cases, some might even defend themselves physically and interfere with treatment.²

Dental anxiety is a prevalent issue that affects both adults and children worldwide. In different populations, the prevalence of dentally afraid children ranges from 3 to 55%.^{5,6} Gender and age seem to be significant factors in dental anxiety, with females being more likely than males to experience dental anxiety.⁵ According to Hmud and Walsh, a number of variables have been linked to dental anxiety, including fear of pain, personality traits, traumatic dental experiences as a child, and having relatives or friends who are dentally anxious.⁷ Children with high levels of dental anxiety were found to have more decayed, missing, and filled teeth, leading to the recognition of this condition as a negative factor with serious consequences for oral health.^{5,6}

There are several methods for assessing dental anxiety in children. The assessment of dental anxiety frequently employs self-report measures. In self-report measures, the dental anxiety score was obtained by directly asking the kids about their anxiety and using a rating scale to score them. Interviews or questionnaires are frequently used in this method.⁵⁻⁷ Self-report measures have the advantage of being simple to administer and taking only a short amount of time to complete.⁵⁻⁸ The aim of the present study was to assess dental anxiety in 8–11-year-old children using a modified version of MCDAS/NS scale and to determine the oral health status of children using DMFT and def Index.

II. METHODOLOGY

This is a Cross-sectional study where a self-reported dental anxiety scale for children – MCDAS/NS was used for the assessment of dental anxiety. It consisted of questions pertaining to dental anxiety in children who are scheduled for their dental treatment. Children between 8 -11 years of age from South Bhopal were selected for this study. 510 children were selected from the respective government and private schools. Among which only 477 children participated in the study, they were further divided according to the schools, gender and age (fig.1). The study questionnaire consisted of 11 biphasic questionnaire in Hindi and English languages (fig.2) and scoring criteria consists of 5 distinct emoticons (emojis) which are familiar to the children for recording anxiety. After obtaining the consent from the concerned authorities and the parents, study proforma was provided to the children for answering the questionnaire. Oral health status of the selected children was assessed using the DMFT and def index.

Wong et al. modified the Corah's Dental Anxiety Scale (CDAS) to create the Modified Child Dental Anxiety Scale (MCDAS). Eight questions are included in the MCDAS to measure dental anxiety related to particular dental procedures. The MCDAS has been used in children aged 8 to 15 and has been proven to be a valid and reliable indicator of young patients' dental anxiety. 6 Children who are capable of good cognitive functioning typically understand a numeric rating scale; however, in the potentially anxious dental situation, the child may regress and experience a lowering of their cognitive ability. However, it has some limitations due to the level of cognitive ability needed to complete the numeric rating scale. As a result, Howard KE et al modified the MCDAS scale with the addition of faces (MCDASf) to correspond to the Likert scale, which could be useful in assessing dental anxiety in both young and anxious older children. But studies report that even these emoticons could be misinterpreted. Hence, we formulated a new MCDASf that is MCDAS/NS which consists of 11 questionnaire corresponding to the dental procedures and 5 different emoticons to elicit the anxiety response. The children were asked the questions and then instructed to point to the face they felt most like at the time. The scale was scored by assigning a value of one to the most positive, relaxed and not fearful, and a value of five to the most negative and fearful. The earlier MCDASf total score ranged from 5 to 40 while in our new scale scores are ranged from 11 to 55. Student t test was used to analyze the mean anxiety of boys and girls between government and private school children. Post hoc tukey test and ANOVA test was used to determine the significant anxiety score between different age groups.

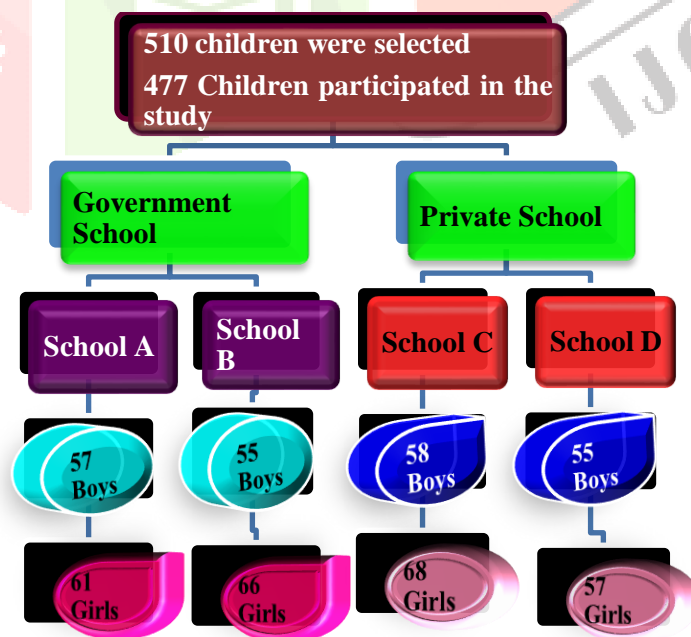


Figure 1: Distribution of Study participants






S.NO	QUESTIONS	 1	 2	 3	 4	 5
1.	डेंटिस्ट के पास जाना Visiting a dentist					
2.	इलाज के लिए इंतजार करना Sitting in the waiting room					
3.	दाँतों की जाँच करवाना Getting your teeth examined					
4.	डेंटल चेयर पर बैठना Lying on the dental chair					
5.	दाँतों की सफाई Having your teeth scraped and polished					
6.	दाँतों को ड्रिल से सफाई करवाना Getting your teeth drilled					
7.	दाँतों में मसाला भरवाना Getting tooth filled					
8.	डेंटल ड्रिल की आवाज सुनना Hearing sounds of dental drill					
9.	मुँह में सुई लगवाना Having injection into mouth					
10.	होठ/जीभ पर सुन्न महसूस करना Feeling numbness on lip and tongue					
11.	दाँत निकलवाना Having tooth taken out					

Figure 2: Study Questionnaire

III RESULTS-

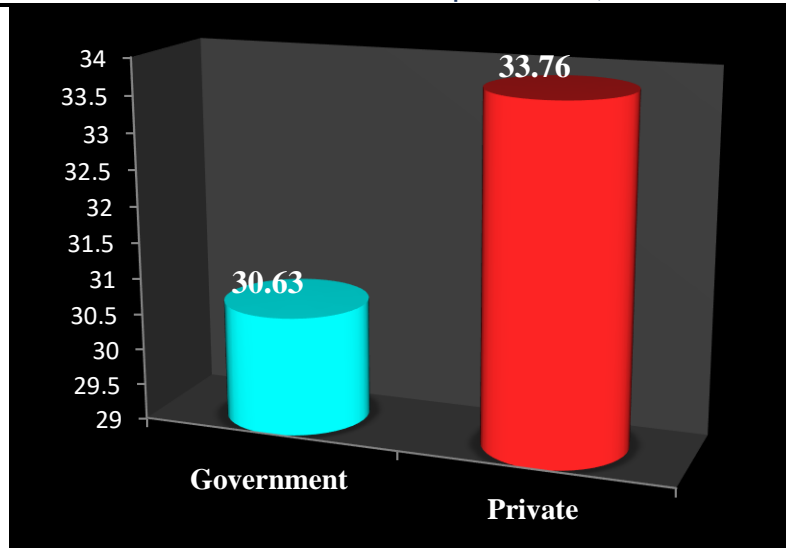
The present study includes 447 children from four schools including two private and two government schools. The mean Anxiety value of government school children were 30.63 ± 4.16 and private school children were 33.76 ± 3.93 . Student t test showed significant difference between the groups with t value 5.69 and p value 0.001. Therefore, the Anxiety scale value of Government school children was comparatively lower than the private school children. (Table 1, Graph 1) There was non-significant difference between two government and two private school children. (Table 2, Graph 2). The mean Anxiety value of Boys was 29.27 ± 2.18 and Girls was 32.72 ± 1.26 . Student t test showed significant difference between the groups with t value 2.39 and p value 0.015. Thus, the Anxiety level of Boys was comparatively lower than the Girls. (Table 3, Graph 3)

The mean Anxiety value of 8-9 years children was 34.56 ± 4.52 , 9-10 years children was 30.96 ± 5.74 and 10-11 years children was 26.47 ± 5.91 . One way ANOVA test showed significant difference between the groups with F value 86.8 and p value 0.001. Post hoc tukey test showed significant difference between all age groups. Therefore, the Anxiety scale value decreases with age. The lower age group had more Anxiety compared to higher age group. (Table 4, Graph 4)

The mean DMFT value of government school children were 2.09 ± 0.44 and private school children were 2.55 ± 0.69 . Student t test showed significant difference between the groups with t value 6.38 and p value 0.001. The mean def value of government school children were 0.85 ± 0.37 and private school children were 1.28 ± 0.41 . Student t test showed significant difference between the groups with t value 5.92 and p value 0.001. Hence, the caries level of Government school children was comparatively lower than the private school children. (Table 5, Graph 5)

Table 1: Comparison Of Dental Anxiety Between Government And Private Schools

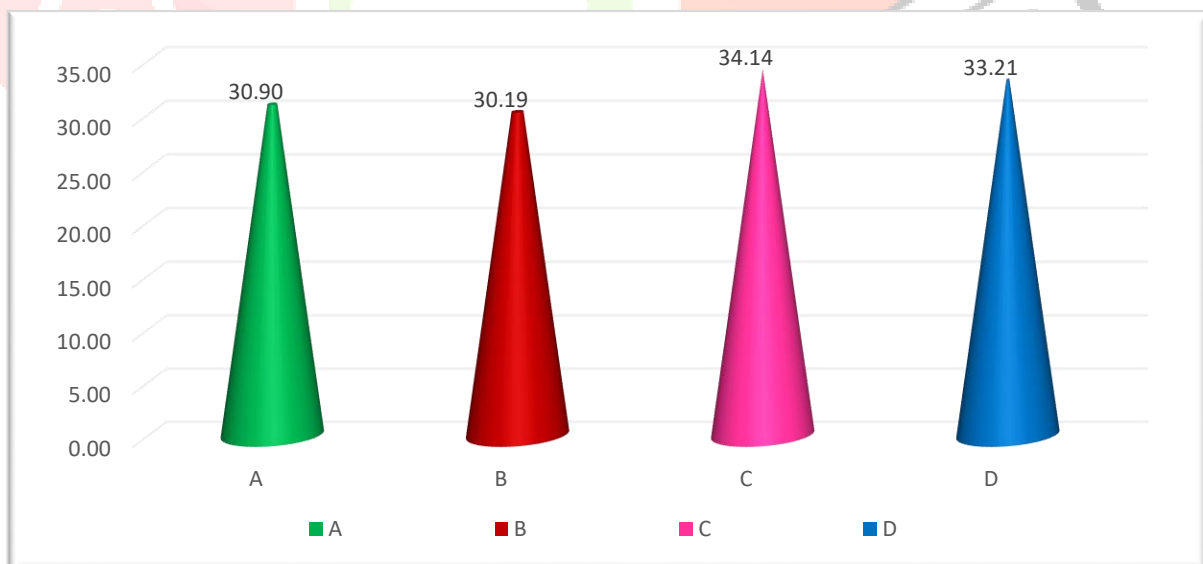
Type of schools	No of participants	Anxiety scale value	T value	P value
Government	239	30.63 ± 4.16	5.69	0.001**
Private	238	33.76 ± 3.93		



Graph 1: Comparison Of Dental Anxiety Between Government And Private Schools

Table 2: Comparison Of Dental Anxiety Scale Between Different Schools

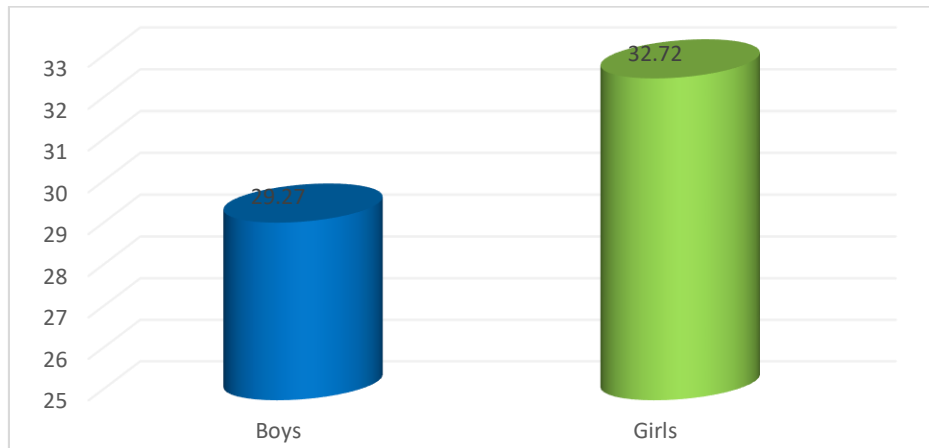
Type of school	No of participants	Anxiety scale value	T value	P value
Government	A 118	30.90±2.16	0.47	0.69
	B 121	30.19±2.44		
Private	C 126	34.14±3.62	1.02	0.26
	D 112	33.21±7.69		



Graph 2: Comparison Of Dental Anxiety Between Different Schools

Table 3: Comparison of Dental Anxiety between Boys and Girls

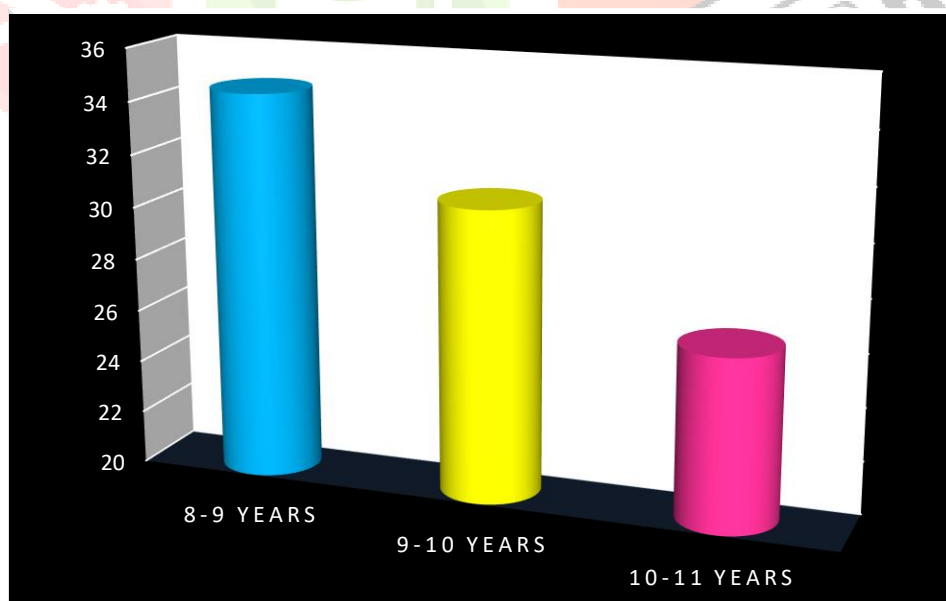
Type of school	No of participants	Anxiety scale value	T value	P value
Boys	225	29.27±2.18	2.39	0.015*
Girls	252	32.72±1.26		



Graph 3: Comparison of Dental Anxiety between Boys and Girls

Table 4: Comparison Of Dental Anxiety Between Different Age Groups

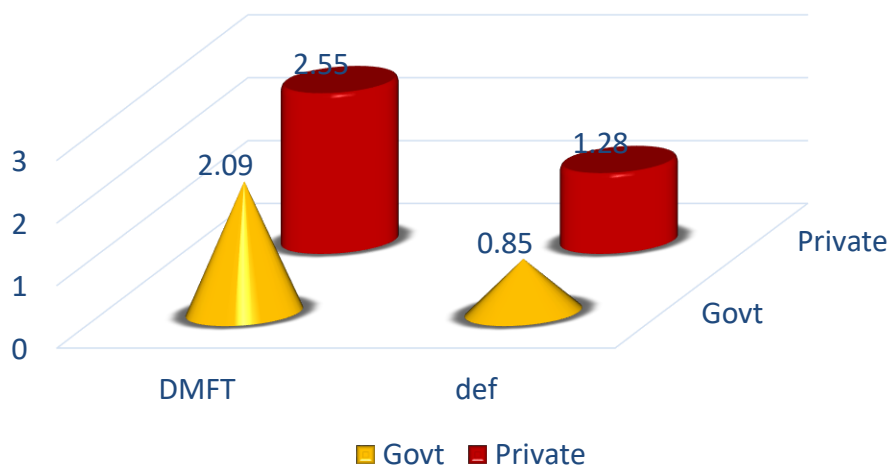
Type of school	No of participants	Anxiety value	F value	P value
8-9 years	153	34.56±4.52	8.86	0.001*
9-10 years	159	30.96±5.74		
10-11 years	135	26.47±5.91		



Graph 4: Comparison Of Dental Anxiety Between Different Age Groups

Table 5: Comparison Of DMFT Between Government And Private Schools Children

Type of school	N	DMFT	Test value	def	Test value
Government	239	2.09±0.44	T=6.38,	0.85±0.37	T=5.92,
Private	238	2.55±0.69	P= 0.001*	1.28±0.41	P= 0.001*



Graph 5: Comparison Of DMFT Between Government And Private Schools Children

IV DISCUSSION-

Dental anxiety in children is difficult for both paediatric dentists and clinicians. An accurate assessment of dental anxiety is required not only to determine its prevalence, but also to overcome the difficulties associated with individual diagnosis and treatment planning.⁸⁻¹⁰ According to Paglia et al. (2017)¹¹, self-assessment scales completed by children are much more accurate than those completed by parents, though the latter may be considered as a good alternative in situations where direct assessment of the child is difficult.¹¹ The MCDASf is a valid and reliable method of assessing dental anxiety in children aged 4 to 12 years. However, there are issues with how patients/children perceive faces/emoticons in relation to their level of anxiety, as evidenced by the fact that the emoticons for numbers 1, 2, and 3 can be interpreted as answers showing a relaxed child, while those for numbers 4 and 5 can be interpreted as an anxious child. Since some specific clinical implications call for additional follow-up studies for evaluation, there is currently no scale to meet the statistical evaluation required for validation.^{12,13} In order to better assess dental anxiety in the study, we modified the MCDASf NS scale and used distinct sets of emoticons that are well-known to children.

Considering the rising evidence from literature which shows documented correlation of dental anxiety to poor oral health, it's critical to recognize children who have dental anxieties or fears at a young age in order to lessen the population-wide effects of these emotional disturbances.⁹ The results of our study shows that the anxiety level of Girls (32.72±1.26) was comparatively higher than the Boys (29.27±2.18). Our study confirmed that girls experience higher levels of anxiety. Our findings are in tandem with the study of Vlad R et al (2020) who discovered that girls (48.75%) had a statistically significant higher percentage of anxiety than boys (38.29%).⁸ Thus, we claimed that gender influences the prevalence of dental anxiety. Data from the literature, however, indicated that women are more likely than men to report dental anxiety, possibly because men tend to conceal their anxiety.¹⁴

The mean anxiety value observed in our study in 8-9 years (34.56±4.52), 9-10 year (30.96±5.74) and 10-11 years (26.47±5.91) which demonstrates that the Dental anxiety decreases with the advancing age. Similar findings were observed in studies of Howard KE et al (2007)⁶, Esa R et al (2015)⁵ and Savin C et al (2021)¹³. Some studies from the literature reveal that, a child's fear and anxiety levels related to visiting the dentist decrease as they get older, and their behaviour there also seems to improve. This is because children develop and mature physically, cognitively, psychoemotionally, and socially as they grow.¹⁵⁻¹⁷ Al-Namankany A et al. (2018) also found a negative correlation between age and dental anxiety scores, with children aged 7-9 years having the highest dental anxiety scores. It appeared that as children's advances in age, their dental anxiety significantly reduced.¹⁸

The mean anxiety value of government school children was 30.63±4.16 and private school children were 33.76±3.93 in our study. The Anxiety of Private school children were higher than the Government school children. Our results are similar with the Study of Shrivastava A et al (2019).¹⁹ The relationship between dental anxiety and decay, missed, or filled teeth is depicted in different ways by specialists; some claimed that children with a high number of decayed teeth had lower levels of dental anxiety, while others demonstrated that children with a greater number of dental lesions had higher levels of dental anxiety. This discrepancy is most likely brought on by the children's preceding dental experiences

in the varied samples. The mean DMFT and def value of government schools is lesser than the Private schools in our study which shows that higher DMFT is positively correlated to higher dental anxiety score. Our results are in tandem with the earlier studies done by Bedi et al (1992)²⁰, and Howard KE et al (2007)⁶.

Table 6- Comparison of MCDASfNS with the earlier scales

	MCDAS	MCDASf	MCDASfNS
Author	Wong HM et al 1998	Howard KE et al 2007	(Nayanlata Saxena)
Target Age group	8-15 years	8-12 years	8-11 years
Findings	<ul style="list-style-type: none"> • Increase in anxiety with age • DMFT was not measured • Difference in anxiety with respect to gender not measured 	<ul style="list-style-type: none"> • Significant Decrease in anxiety with age • Anxious Children had more caries than non-anxious • Difference in anxiety with respect to gender not measured 	<ul style="list-style-type: none"> • Significant Decrease in anxiety with age • Higher DMFT was observed with high dental anxiety score • It was observed that girls experienced more anxiety than boys.

V Conclusion –

Advantages of our modified version scale of MCDASfNS

- We noted a Significant Decrease in anxiety with advancing age (As patient's age increases, the anxiety component decreases, which is statistically significant)
- Further a Higher DMFT was observed with high dental anxiety score (we observed a positive correlation between dental caries and anxiety scores)
- Our study reported prevalence of dental anxiety was more in Girls than boys.

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