Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 85.10

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Dental Anxiety Among Final Year Undergraduate Students, Postgraduate Pediatric Dental Students and their instructors: A Cross Sectional Study

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***ABSTRACT*:**

Introduction: Dental anxiety constitutes a major problem for patients and dental care providers alike. Anxious patients tend to avoid treatment, and are difficult to manage once they are in the dental chair. Avoidance of dental treatment due to anxiety is very common and appears to be strongly associated with extreme deterioration of oral and dental health. **Aim:** Measure the dental anxiety levels of Final Year Undergraduate Students, PGS and their instructors. Ranking of the most anxiety-provoking situations in the dental setting by using MDAS and DFS. **Population and method**: The study population included 60 Final Year Undergraduate Students,60 Postgraduate Pediatric Dental Students and 60 instructors. All the instructors were specialists in pediatric dentistry. MDAS and DFS used to collect the response. **Results:** The mean MDAS and DFS scores of final year UGS, the PGS and the instructors was 18.46±3.13 for UGs, for PGs it was 15.70±1.51 and for instructor it was 8±2.03. Mean DFS total score for UGs was 36.23±4.77, for PGs it was 27.06±4.02 and for instructor it was 17.86±4.83. **Conclusion:** The level of dental anxiety among UGS is more as compared to PGS and their instructors it might affect pediatric dental treatment provided by one group or the other.

Key words: Dental anxiety, Dental fear, MDAS, DFS.

Received: 23/07/2020 **Modified:** 18/08/2020 **Accepted:** 20/08/2020

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This article may be cited as: Rojekar N, Sajjanar A, Kulkarni S, Bhattad D, Shukla H, Bhagwani D. Dental Anxiety Among Final Year Undergraduate Students, Postgraduate Pediatric Dental Students and their instructors: A Cross Sectional Study. J Adv Med Dent Scie Res 2020;8(10):39-45.

INTRODUCTION

Dental anxiety constitutes a major problem for patients and dental care providers alike. Anxious patients tend to avoid treatment, and are difficult to manage once they are in the dental chair. Avoidance of dental treatment due to anxiety is very common and appears to be strongly associated with extreme deterioration of oral and dental health.(1) Dental anxiety can be described as an aversive emotional state of apprehension or worry in anticipation of the feared stimulus of dental treatment.(2) It reflects a combination of biochemical alterations in the body and patient's personal history, memory, and social state. The presence of dental anxiety is not a dilemma for patients only but also for the dental professionals themselves; and sometimes it renders the treatment more complicated to be accomplished successfully.(3)

Many scales were developed in order to assess dental anxiety. Corah Dental Anxiety Scale was proven to be popular among dental researchers. It is a simple, easy to score, short, valid and reliable test for dental visit-associated anxiety. Humphris, Morrison and Lindsay (1995) provided a modified scale from the original Corah Dental Anxiety Scale. The Modified Dental Anxiety Scale (MDAS) was shown to be more comprehensive, highly valid and reliable, with a simpler and more consistent answering system. The Modified Dental Anxiety Scale will be, therefore, used to

measure dental anxiety in the current study.(4)
Phobia, which shares features with both anxiety and fear, involves an avoidance response and is associated with a debilitating loss of function.(5) The Dental Beliefs Survey (DBS) was developed to assess the patient's views about the dentist and dental treatment in three areas (subscales): professionalism, communication and lack of control, and it has been translated into a number of languages and into shorter versions. Higher scores in the Dental Beliefs Survey indicate greater negative beliefs. In terms of construct validity, researchers have found that Dental Beliefs Survey scores are related to attitudes and behavior consistent with what the scale was to measure. For example, dentally fearful adults have higher scores than dental patients in general.(6)
Identifying anxious individuals can enable the dentist to anticipate patient's behavior and be better equipped with measures to help alleviate patient's anxiety.(7) Corah dental anxiety scale shown to be more inclusive, highly valid and reliable. Thus Modified Dental Anxiety Scale will be, therefore, used to measure dental anxiety in the current study.(8)
Dental students preparing for a professional career must not only learn dental techniques, but also how to deal with patient fear and anxiety in children, adults and the elderly.(9)Those experiencing high levels of dental anxiety are among those with the poorest oral health related quality of life.(10) Despite the technological advances made in modern dentistry, anxiety about dental treatment and fear of pain associated with it remains widespread.(11)The evaluation of dental anxiety is therefore largely based on interpretation of observed behavior in the dental situation using rating scales.(12) The Dental Fear Survey does appear to have some construct validity: high scorers differ as expected from low scorers with regard to cancelled appointments, waiting room activity levels, pain reports during treatment, and patterns of palm sweating. To that extent, the Dental Fear Survey is a promising standardized laboratory tool for assessing the verbal and cognitive dimensions of dental fearfulness.(13)
Many adults with Dental Fear Assessment may verbalize their fearful feelings in front of their children, creating a negative impression on dental treatment.(14) There are several theories which attempt to explain the causes of dental anxiety. Of these, unpleasant experiences whilst receiving dental treatment from a non-empathetic or 'bullying' dentist appear to represent the primary cause of dental anxiety.(15) The Dental Fear Survey (DFS) has routinely been used to measure and predict dental fear amongst dental patients.(16) Dental students' own experiences with dental anxiety and their understanding of dental anxiety have become of great importance in dental education. (17) Dental fear, anxiety, phobia and behavior management problems (DBMP) are different concepts related to each other, but not identical, and can involve different physiological, cognitive, emotional and behavioral components.(18)
The aims of the present study were to
1. Measure the dental anxiety levels of Final Year Undergraduate Students, PGS and their instructors, and
2. Ranking of the most anxiety-provoking situations in the dental setting by using MDAS and DFS.

POPULATION AND METHOD

The study population included 60 Final Year Undergraduate Students,60 Postgraduate Pediatric Dental Students and 60 instructors. All the instructors were specialists in pediatric dentistry. After receiving approval of the ethical committee to conduct this study, all 180 participants were asked to complete an anonymous two-section questionnaire. The first part dealt with the modified dental anxiety scale (MDAS) (Figure 1), and the second part was a dental fear survey (DFS) (Figure 2).

MEASURES

The MDAS contains five multiple choice items dealing with the subjective reactions to the dental situation:
(a) Anticipating the visit to dental clinic,
(b) Waiting in the dentist's waiting room,
(c) Waiting in the dental chair for drilling,
(d) Waiting in the dental chair for scaling the teeth and
(e)Local anaesthetic injection.

Five possible answers in an ascending order from 1 to 5 are provided, each carrying a maximum score of 5, with a total possible maximum score of 25 for the entire scale. The DFS consists of 20 questions divided into three sections: (a) Avoidance of dental treatment, (b) Somatic symptoms of anxiety, and (c) Anxiety caused by dental stimuli. Each question has a maximum score of 5. A standard computer program for statistical analysis (SPSS 512+, Brain Power Inc, Calabasas, CA 92302, USA) was utilized. Student's t-test was used to compare the scores of MDAS and DFS between final year UGs, the PGS and the instructors, and to determine differences between them for the other items in the questionnaires as well as those based on gender. Pearson correlation was used to examine correlations between the MDAS and the DFS scores. Analysis of variance (ANOVA) with Scheffe's multi-comparison procedure was used to compare the items within the MDAS scores of the three study groups. The level of significance was set at a p-value ≤ 0.05.

Appendix-2

Modified Dental Anxiety Scale

CAN YOU TELL US HOW ANXIOUS YOU GET, IF AT ALL, WITH YOUR DENTAL VISIT?

PLEASE INDICATE BY INSERTING 'X' IN THE APPROPRIATE BOX

1. **If you went to your Dentist for TREATMENT TOMORROW, how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

1. **If you were sitting in the WAITING ROOM (waiting for treatment), how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

1. **If you were about to have a TOOTH DRILLED, how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

1. **If you were about to have your TEETH SCALED AND POLISHED, how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

1. **If you were about to have a LOCAL ANAESTHETIC INJECTION in your gum, above an upper back tooth, how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

Instructions for scoring (remove this section below before copying for use with patients)

The Modified Dental Anxiety Scale. Each item scored as follows:

Not anxious	=	1
Slightly anxious	=	2
Fairly anxious	=	3
Very anxious	=	4
Extremely anxious	=	5

Total score is a sum of all five items, range 5 to 25: Cut off is 19 or above which indicates a highly dentally anxious patient, possibly dentally phobic

Appendix 2

Dental Fear Survey (DFS)

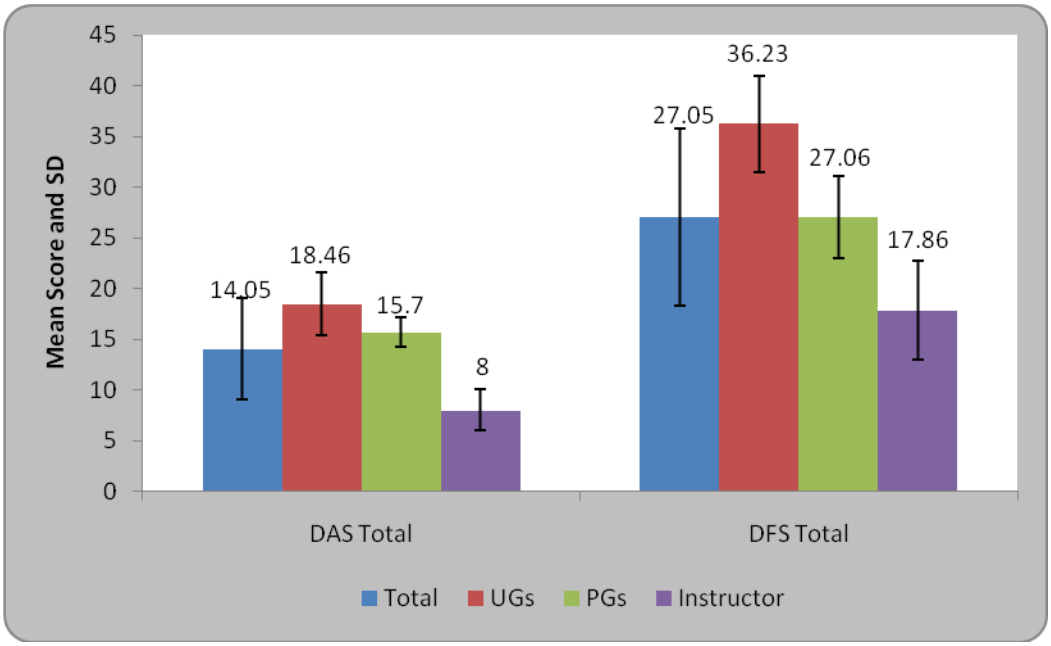
	Never 1	Once or twice 2	Few times 3	Often 4	Nearly every time 5
Has fear of dental workever caused you to cancel or not appear for an appointment?					
During dental treatment, my breathing rate increases?					
During dental treatment you perspire?					
During dental treatment, I become nauseated and stick to my stomach?					
During dental treatment, my heart rate increases?					
During dental treatment, have you ever aspired dental instrument?					
During dental treatment, have you ever felt lack of control over the situation, including inability to stop procedure you find unpleasant?					
During dental treatment your muscle becomes tense?					
During dental treatment have you felt restless?					
During dental treatment have you ever got faint?					

RESULTS

The mean MDAS and DFS scores (with standard deviations [SD]) of final year UGS, the PGS and the instructors are shown in mean MDAS total score for UGs was 18.46±3.13, for PGs it was 15.70±1.51 and for instructor it was 8±2.03. By using one way ANOVA statistically significant variation was found in mean MDAS score among UGs, PGs and instructor($F=162.74, p=0.0001$).

Mean DFS total score for UGs was 36.23±4.77, for PGs it was 27.06±4.02 and for instructor it was 17.86±4.83. By using one way ANOVA statistically significant variation was found in mean DFS score among UGs, PGs and instructor($F=121.69, p=0.0001$). Graph 1.

Graph 1. Means and SD of the DAS and DFS scores of the UGS, PGS and their instructor



On comparing DAS score in UGs, Pgs and instructor by using Multiple comparison Tukey Test, statistically significant difference was found between UGs and PGs(p=0.0001), UGs and instructor(p=0.0001) and between PGs and instructor(p=0.0001).

On comparing DFS score in UGs, Pgs and instructor by using Multiple comparison Tukey Test, statistically significant difference was found between UGs and PGs(p=0.0001), UGs and instructor(p=0.0001) and between PGs and instructor(p=0.0001).

Multiple Comparison: Tukey Test

			Mean Difference (I-J)	Std. Error	p-value	95% Confidence Interval	
						Lower Bound	Upper Bound
DAS Total	UGs	PGs	2.76	0.60	0.0001,**S**	1.33	4.20
		Instructor	10.46	0.60	0.0001,**S**	9.03	11.90
	PGs	Instructor	7.70	0.60	0.0001,**S**	6.26	9.13
DFS Total	UGs	PGs	9.16	1.17	0.0001,**S**	6.35	11.97
		Instructor	18.36*	1.17	0.0001,**S**	15.55	21.17
	PGs	Instructor	9.20	1.17	0.0001,**S**	6.39	12.00

By using Pearson's correlation coefficient positive correlation was found between DAS score and DFS score for UGs(r=0.460,p=0.001), for PGs(r=0.927,p=0.0001) and for Instructor(r=0.435,p=0.016).

Table 2: Correlation between DAS and DFS score among UGs, PGs and Instructor

Pearson's Correlation Coefficient

	DAS Score	DFS Score	r-value	p-value
UGs	18.46±3.13	36.23±4.77	0.460	0.001,S
PGs	15.70±1.51	27.06±4.02	0.927	0.0001,S
Instructor	8±2.03	17.86±4.83	0.435	0.016,S

The highest score in an analysis of the specific physical items in the DFS was observed for item 10, followed by items 8, 4,2,9,2,1 for UGs. The highest score in analysis of the specific physical items in the DFS was observed for

item 19 followed by item 9,2,3,10,4 and for instructor highest DFS score was observed for item 6 and 7 followed by items 8,10,9,5,1,2,3. The difference between item to item 10 were statistically significant (p=0.0001).

Table 3. Means and SD of the Ugs, PGs and the instructors DFS scores on the 10 items for which the group difference was significant

DFS Item	UGs	PGs	Instructor	F-value	p-value
Item 1	3.33±1.21	3.23±0.56	1.50±0.50	46.58	0.0001,S
Item 2	3.53±0.81	2.93±0.25	1.50±0.50	98.80	0.0001,S
Item 3	3.73±0.44	2.93±0.25	1.50±0.50	219.37	0.0001,S
Item 4	3.86±0.50	2.66±0.60	1.30±0.48	176.17	0.0001,S
Item 5	3.33±0.88	1.93±0.25	1.66±0.92	42.51	0.0001,S
Item 6	3.30±0.79	2.40±0.81	2.30±0.46	18.07	0.0001,S
Item 7	3.33±1.02	2.40±0.81	2.30±0.46	15.09	0.0001,S
Item 8	4±1.41	2.76±0.77	2.13±0.50	28.39	0.0001,S
Item 9	3.60±2.04	2.96±1.12	1.70±0.79	13.84	0.0001,S
Item 10	4.20±0.80	2.83±0.83	1.96±1.12	43.57	0.0001,S

The highest score in an analysis of the specific physical items in the DAS was observed for item 5, followed by items 4,3,2,1 for UGs. The highest score in analysis of the specific physical items in the DAS was observed for item 5 followed by item 1,3,2,4 and for instructor highest DAS score was observed for item 5 followed by items 4,1,2,3. The difference between item 1 to item 5 were statistically significant (p=0.0001).

Table 4. Means and SD of the UGs, PGs and the instructors DAS scores on the 5 items for which the group difference was significant

DAS Item	UGs	PGs	Instructor	F-value	p-value
Item 1	3.26±1.43	3.20±0.40	1.40±0.81	34.90	0.0001,S
Item 2	3.40±1.13	2.93±0.25	1.26±0.44	73.05	0.0001,S
Item 3	3.66±0.92	3.13±0.50	1.26±0.44	109.08	0.0001,S
Item 4	3.93±0.25	2.86±0.50	1.73±0.44	207.83	0.0001,S
Item 5	4.20±0.40	3.56±0.50	2.33±0.88	67.51	0.0001,S

DISCUSSION

The aim of this study was to compare the dental anxiety levels UGS,PGS and their instructors with those of their instructors. The reasults of our study shown that UGS are most anxious and fearful as compared to PGS and instructors. An earlier study had shown a reduction in the levels of dental anxiety over time among undergraduate dental students during their fourth, fifth and sixth year of studies, from a mean DAS score of 10.4 in the third year to 9.27 in the fifth year and 8.00 in the sixth year.(1)

In our study, the mean DAS scores of the instructors (8±2.03) were much lower than the scores of the undergraduate students, possibly indicating a continuing reduction of dental anxiety levels over time. The DFS scores in our study demonstrated that physical signs (perspiration when dental work was done, the smell of the dentist's office and seeing the dentist walk into the treatment room) were significantly higher among the UGS compared to the PGs and instructors. This may reflect that some physiologic signs remain unchanged despite greater exposure over time during their training.(1) Several studies have suggested that there is an inverse relationship between age and levels of dental anxiety.(2)

The Modified Dental Anxiety Scale is considered to be valid, reliable, brief, accessible, and easy to use; thus, it was used to assess the levels of dental anxiety in this study.(3) The anticipation of undergoing dental treatment appears to be the strongest stimulus in generating dental anxiety among three of our study groups. dental anxiety might decrease with age include the ability to cope with experiences or the phenomenon may be due to the ageing process itself characterized by a general decline in anxiety.(5) Lack of dental health education might result in dental fear and anxiety which in turn might end with poor compliance and attitudes. This information will be further utilized in developing the best strategies to manage patient anxiety. For a successful dental treatment, a gentle, supportive, professional, concerned, soft and more understanding approach should be undertaken when managing patients with dental anxiety.(8) Among the stimuli studied, those that achieved the highest fear index values were the sight of the needle, the sensation of injection during anesthesia (48.9%) and the sound and sensation of the

drill on the teeth (27.6%). The findings corroborate those reported by Yoshida et al. (2009).(9)

Prevalence of dental anxiety was found to be 46%, which suggests that despite the technological advances made in modern dentistry, anxiety associated with dental treatment was widespread.(10) The need for assessing and addressing childhood DFA at an early stage should be emphasized to enable identification of children with high dental fear and consequently to prevent the negative consequences of high dental fear in them. The psychological impact of dental anxiety and fear is well documented and quality of life is increasingly acknowledged as a valid, appropriate and significant indicator of service needs and interventions outcomes in contemporary public health research and practice.(11)

CONCLUSSION

Our findings on samples of UGS, PGS and their instructors indicate that the level of dental anxiety among UGS is more as compared to PGS and their instructors it might affect pediatric dental treatment provided by one group or the other. These results help to provide a better understanding of an important aspect affecting all caregivers of dental treatment to pediatric dental patients, and delineate another role of the dental school instructors, that of desensitizing the dental anxiety.

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