

PREVALENCE OF DENTAL ANXIETY AMONG UNIVERSITY STUDENTS IN ISLAMABAD, PAKISTAN

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ABSTRACT

Objectives: *The aims of the current study were to find the prevalence of Dental Anxiety amongst Pakistani University Students and to determine the differences in relation to gender, education and level of dental anxiety.*

Methods and Materials: *A questionnaire consisting Dental Anxiety Scale and Dental Fear Scale describing anxiety-provoking stimuli was constructed and presented to 385 university students.*

Results: *A convenient sample of 11 Universities students (n=385) of Islamabad, the capital of Pakistan was selected for the survey. The survey comprised different questions concerning demographic variables, first dental visit, last dental visit and reasons for avoidance of dental appointment and the level of dental anxiety. The methods of measurement of dental anxiety were 20 questions of Dental Fear Scale and 4 questions of the Corah Dental Anxiety Scale. The results indicated that waiting for the drill in Dental Anxiety Scale was highly prevalent while in Dental Fear Scale the most fear provoking stimuli for university students were items dealing with injection feeling and sight of the needle. Females were significantly more likely to report a high dental anxiety compared to males ($p < 0.05$). The prevalence of high dental anxiety (Phobia) in the sample as measured by the Dental Fear Scale and Dental Anxiety Scale was 21.8% and 21.4% respectively.*

Conclusions: *This study found a relatively high prevalence of dental anxiety and fear which confirm the scope of this problem facing dentists as well as patients. This problem should be addressed by the policy makers to improve the oral health of the population. The present findings support the need for assessment procedures using a broad spectrum of potentially anxiety-provoking stimuli in general population as well.*

Key words: *Dental Anxiety, University students, Dental Anxiety Scale.*

INTRODUCTION

Dental fear, dental anxiety and dental phobia are concepts that are often used interchangeably. However, they are closely related; it is possible to unravel this concept. Dental fear is considered to be a common response to one or more specifically threatening stimuli in dental setting or to the dental setting in general, and is therefore considered an adaptive and healthy response¹. This in contrast to dental anxiety, which is more diffused not related to a direct threat, as it has become anticipatorily oriented towards fu-

ture events, rather than being a direct adaptive response^{1,2}. Dental phobia represents a severe form of dental anxiety and is characterized by a marked and persistent fear in relation to either clearly perceptible situations/ objects e.g. drilling, injections or to dental procedures in general, and has a significant influence on daily functioning. The term dental phobia by definition refers to a pathological condition and is accordingly included as a specific phobia in the diagnostic and statistical manual of mental disorders (DSM-IV-TR) published by the American Psychiatric Association³. Most people experience some apprehension or anxiety when attending a dentist for treatment^{4,5}. Stouthard & Hoogstraten⁵ found that only 14.2% of their sample experienced no fear or apprehension while visiting the dentist. By contrast, 40% indicated that they were anxious about dental treatment, and 10% claimed to be extremely anxious. People with high

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levels of dental anxiety often report that their anxiety has a large impact on daily life in terms of limited functioning and oral health-related problems⁶. The negative influence of severe dental anxiety on daily life raises questions regarding the aspects of the dental setting that have the potential to evoke such impairing anxiety responses. Research shows that peoples past experiences in the dental setting determine the way they perceive the dental situation and the extent to which distinct stimuli evoke fear and avoidance behavior⁷. Quite a large number of studies have been conducted to identify the potential anxiety-provoking stimuli present in the dental setting. These stimuli include receiving an injection^{8,9}, having dental X-rays taken¹⁰, the sight of the needle¹¹, various aspects of the drill, such as sight, sound, smell and sensation^{12,13}, negative behavior of the dentist¹⁴, pain sensations¹⁵, and several other potentially fear-evoking aspects present in the dental practice e.g. the smell, the dental personnel, and the chair.¹⁶⁻¹⁸

However, these studies have several limitations. First, they cover very few of the anxiety-provoking stimuli that are present in a dental setting. For example, only 5 out of the 27 studies covered more than 12 dental stimuli¹⁸ and none covered more than 22, which makes it likely that essential stimuli were missed. Furthermore, a substantial number of studies used the Dental Fear Scale (DFS)^{11,12,16,18}, which was developed primarily to assess the severity of dental trait anxiety rather than to identify the potential anxiety-provoking capacity of various stimuli. Therefore, the DFS covers only a limited number of the dental objects and situations to which patients can be exposed.

Finally, owing to the great variability in the various samples (i.e. students, children, dental patients, and general population groups) and in the sample sizes (which range from 19 to 1,437 subjects) of the previous studies it is difficult to draw unequivocal conclusions. Treatment of patient's suffering from dental fear or phobia, particularly in settings to which dentally anxious patients are referred in order to reduce their pathological fear response, cannot start if the dentist or psychologist remains unaware of the characteristics, the maintaining factors, and the consequences of the patient's condition. Thus, assessment of a wide range of anxiety-provoking stimuli is of both empirical and clinical importance.

The prevalence of dental anxiety has been shown to range between 4 and 20% in the general popula-

tion of industrialized countries¹². However, there are no such data available for Pakistan. In the absence of a comprehensive study to evaluate the prevalence of dental anxiety in the general population of Pakistan, it will not be possible to advocate services or training for this group. Special care for people with dental anxiety or phobia has a cost¹³ and research studies are needed to support reorganization of both dental teaching and dental services. The present study was conducted as a first step to initiate this process. Due to paucity of resources and time, the study was conducted among university students of Islamabad.

The main aim of the current study was to find Prevalence of Dental Anxiety in Pakistani University Students. The second aim was to assess differences in gender, age, education, and level of dental anxiety. In addition, the relative contribution of these variables to the total variance in stimuli ratings was assessed, given that the existing questionnaires on dental anxiety and fear cover only a limited set of stimuli.

MATERIAL AND METHODS

A total of 385 students from 11 Universities in Islamabad were approached by the researcher and were invited to participate in a study on dental anxiety/fear. The participants were approached in university cafeterias and different sitting places across the Islamabad Universities. The locations were selected in advance to complete the questionnaires. The decision to use face-to-face administration, rather than telephone, mail or internet administration, was based on considerations related to accuracy of the screening, coverage properties, response rates, and magnitude of the survey/respondent burden¹⁹.

Instruments

The first part of the questionnaire developed for this study consisted of four items pertaining to demographic variables. The second part contained the Dental Anxiety Scale (DAS)²⁰. This 4- item scale measuring dental trait anxiety is the questionnaire most widely used in studies on dental anxiety. Responses are scored from 1 to 5, providing total scores ranging from 4 (not anxious at all) to 20 (extremely anxious). Dental Anxiety Scale scores of 13 or higher are considered as indicative of high dental trait anxiety²¹.

The third part of the questionnaire contained 20 items of Dental Fear Scale (DFS). Each stimulus was scored on a 5-point scale, from 1 (not at all) to 5

(very much anxiety provoking). The large majority of the potential anxiety-provoking stimuli adopted in this study ($n = 4+20$ stimuli) resulted from DAS and DFS used widely in research.

Procedure

The study was reviewed and approved by the Institutional Review Board (IRB) of the Human Subjects Committee (HSC) of Riphah International University, Islamabad. Permission for data collection was obtained from the administration office of each university. Data collection was conducted over three months time. Standard procedures of informed consent were used inclusive of anonymity and confidentiality. The questionnaires were completed on spot by the researcher.

Statistical analyses

Dental Anxiety Scale (DAS), Dental Fear Scale (DFS), Age, Gender, Education level and 1st dental visit experience, time since last dental visit and reasons for avoidance dental appointment were the variables under study. The quantitative variables were described as mean + standard deviation while qualitative variables were described as frequencies and percentages. Data set were subjected to descriptive statistical tests together with student's t-test at 0.05 confidence level. All tests were carried out using SPSS version 13 statistical package.

RESULTS

Of the 400 completed questionnaires, 15 could not be used due to missing data (less than 80% of the questions were answered) and these were excluded from subsequent data analyses. Of the 385 remaining participants (response rate: 96.25%), 175 were female (45.7%) and 209 were male (54.3%). The age of the respondents varied between 21-32 years and the mean age of the respondents was 26.5 ± 5.5 years.

Hierarchy of stimuli

The means and standard deviations of dental anxiety (DAS) for the total population by age, gender, education and the first dental experience are shown in Table-1. In this study, 209 male and 176 female patients filled in the questionnaires. The average DAS value of these patients was 8.56 ± 3.59 . The results showed that education had significant effect on dental anxiety ($p < 0.05$). Females tend to be more anx-

ious than males, but it has not reached statistical significance ($p > 0.05$). Patients in their 3rd decade (20-25 years) showed the lowest DAS values and statistically significant difference was found ($p < 0.05$) when they were compared with the others groups in their (26-30 years) and above 30 years. There is a striking statistical difference in respect to the patients' first dental experiences ($p < 0.05$). The patients who had bad or traumatic experiences had higher DAS value compared to those who had favorable experiences.

Table 1: Demographic Characteristics and the Mean and SD of Dental Anxiety

Features	n	DAS Mean $\pm$ SD	P- value
Age			
20-25 years	264	8.40 ± 4.12	> 0.05
26-30 years	99	8.94 ± 4.02	
> 30 yrs	22	9.00 ± 5.65	
Gender			
Male	209	$8.45 \pm 3.06^*$	< 0.05
Female	176	8.75 ± 4.14	
Education			
Bachelor	154	$10.05 \pm 4.33^*$	< 0.05
Master	187	6.80 ± 3.38	
Above Master	44	11.00 ± 0.00	
Experience			
Pleasant	286	8.94 ± 4.54	> 0.05
Unpleasant	99	7.54 ± 3.44	

Table-2 shows that the mean DAS score obtained from the study population. The score of female participants were higher than male counterparts in the last three DAS items. While it is slightly higher in total DAS score. The significance level ($p < 0.05$) was observed in items of DAS dealing with, "waiting in the waiting rooms for their turn", "waiting for the drill" as well as waiting for scaling teeth.

The prevalence of dental fear was assessed by the response to the question "How would you rate your feelings toward having dental treatment done?". These were then dichotomized according to their self-reported level of anxiety in Figure 1. Those that answered that they were not at all afraid, a little afraid, or somewhat afraid were grouped together as having no fear or a low level of fear, while those that reported that they were either very afraid or terrified were grouped together as having a high level of fear (Figure-1).

Table 2: Mean DAS score obtained from Male and Female University Students

DAS Items	Males	Females	Total Population
1- Feelings while visiting a dentist	2.15± 0.50	2 ± 1.26	2.07± 0.88
2- Waiting in the waiting room	1.52± 0.51*	2.50± 1.54	2.01± 1.02
3- Waiting for the Drill	2.31± 0.88*	3.2± 1.34*	2.75± 1.11
4- Waiting for Scaling	2.47± 1.17*	1± 0.00*	1.73± 0.58
Total DAS Score	8.45± 3.06	8.7± 4.14	8.56± 3.59

*P < 0.05, Student's t-test

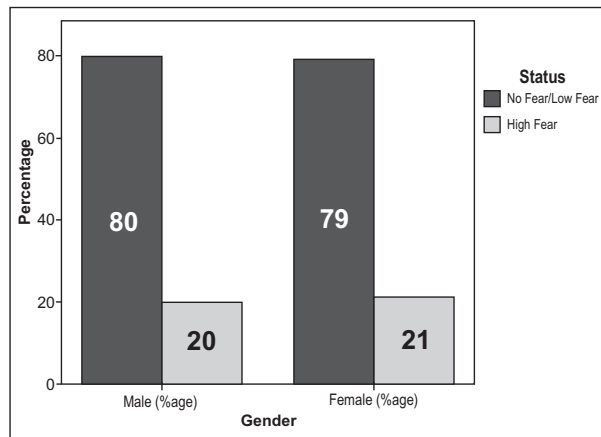


Fig. 1: Dichotomized Grouping of Dental Fear

Table-3 shows the mean score for the DFS. In majority of items of DFS scale, females showed higher score than males. Except for the items dealing with 'being seated in the dental chair' (item no.11) and 'feeling the vibration of the drill' (item no.18), both showed same mean DFS score. This is further demonstrated in the mean scores of the subsections of the survey: 'dental stimuli' where they showed the same mean score. In the subsection: 'Avoidance' females showed higher score than males. While in subsection: 'somatic' males showed higher score than females. The most fear provoking stimuli for surveyed populations were items dealing with injection feeling and seeing the needle.

In general, the most fear provoking stimuli for surveyed populations were items dealing with injection feeling and seeing the needle, possibly resulting in tissue damage and pain.

Table 3: Mean Score for Dental Fear Survey (DFS)

DFS Items	Males	Females	Total Population	Ranking
1	2.36±1.36	2.68±1.36	2.52	9
2	2.26±1.04	2.50±1.03	2.39	11
Mean 'avoidance'	2.31	2.59	2.45	
3	1.84±0.95	1.81±0.91	1.82	17
4	2.15±1.16	2.50±1.26	2.32	12
5	2.57±1.53	2.50±1.54	2.53	8
6	2.26±1.28	1.40±1.00	1.83	16
7	2.36±1.38	2.18±1.27	2.27	13
Mean 'somatic'	2.23	2.08	2.15	
8	1.68±0.47	1.81±0.40	1.74	18
9	1.68±0.47	1.81±0.40	1.74	18
10	2.47±0.51	2.50±0.51	2.48	10
11	2.94±0.91	2.91±0.85	2.94	5
12	2.15±1.34	1.87±1.14	2.01	14
13	1.68±0.47	1.81±0.40	1.74	18
14	4.31±0.47	4.18±0.40	4.24	2
15	4.78±0.41	4.68±0.47	4.73	1
16	3.31±0.47	3.18±0.40	3.24	4
17	2.89±0.31	2.81±0.40	2.85	6
18	3.89±0.56	3.87±0.71	3.88	3
19	1.78±0.63	2.00±0.63	1.89	15
20	2.68±0.47	2.81±0.40	2.74	7
Mean 'stimuli'	2.78	2.78	2.78	
Total DFS	2.44	2.48	2.46	

*P < 0.05, Student's t-test

DISCUSSION

Dental fear and anxiety are the universal problems affecting large populations of different countries. This problem of anxiety results in avoidance of dental care which leads to severe caries and periodontal diseases with severe adverse consequences to the patient's general as well as oral health.

This study investigated the fear and anxiety in Pakistani universities population on a small level. The mean DAS score of our population (8.56± 3.59) was less comparatively to the score found by Peretz and

Efrat¹⁸ in Israeli young adults which was 9.49 ± 3.20 . In this study, the score of our sample population was approximately same to the mean DAS score of Israeli kibbutz population who demonstrated mean DAS score of 8.98²² but higher than DAS score of patients in private practice in USA²³ and Sweden²⁴ which are 6.4 and 7.3 respectively. A further comparison demonstrated that the mean DAS score of present study population is also in line with the score recorded by Kaufman E et al²⁵ in Israel which are equal to 8.9 in both countries.

In the present female students showed higher score than their male counterparts and statistically significant difference ($P < 0.05$) was found as shown in Table 3. This finding is in agreement with Redi et al²⁶ and Peretz et al¹⁸ where they found the same results. Although in contrast to the findings of Ozdemir et al²⁷, where they found higher anxiety scores of males than females, present finding is similar to most previous studies that reported females tend to be more anxious than males and showed higher DAS values^{18,28-31}. While some researchers, have found no direct effect of gender on dental anxiety,³² psychopathological studies have revealed that females are over-represented regarding anxiety, worry and fear, a phenomenon regardless of its basis, appears to be highly generalized and widely found in various cultures and populations.³³

The response pattern of male and female is interesting because as mean DAS score for female is higher than male but in Dental Fear Survey Questionnaire, male showed higher score than female in most anxiety provoking stimuli like seeing at the anesthesia needle (item 14) and its injecting feelings (item 15). Contrary to the stimuli which are less anxiety and fear provoking, female had higher score compare to male like waiting in the sitting room. This finding may suggest that the female higher dental anxiety is not absolute but it varies from stimulus to stimulus.

In the present study, anxiety levels for age groups showed no statistically significant difference for DAS scores. However, the individuals in the last and oldest group (above 30 years) had showed the highest DAS score. This finding is not in accordance with Stabholtz et al²⁸, Thomson et al.³², Brand et al.³⁴ and Hagglin et al.³⁵ who had reported that as age increases the DAS values decrease and this decrease in DAS in aged individuals could be associated with experiences of different dental procedures and relationship with dentists over years.

In this study, the lower DAS values in earlier periods may be associated with the inexperience of patients to the dental procedures. The increase in education level may provide a better oral health and hygiene and increased number of periodical dental controls³¹. In this study, anxiety levels for different Education groups showed statistically significant difference ($p < 0.05$) for DAS scores in different education levels as shown in Figure-1. Studies showed that increase in education level results in decreasing dental anxiety^{31,36}. Similarly, the results of our study showed that there is relationship between the dental anxiety and various education levels but higher education level also showed high level of DAS score which is probably due to small sample size. This result is approximately in accordance with Özdemir et al.²⁷ and Ay et al³⁷.

There is no statistically significant difference ($P > 0.05$) between 1st dental experience and DAS score. Etiologically, dental anxiety is not a homogenous group and results from different factors³⁸. Some of the factors are negative acknowledgement, experiences and being a witness to a traumatic or unpleasant dental procedure. Specially, previous negative experiences have an important effect on the appearance of dental anxiety³⁹. But our study showed an inverse relationship between first dental visit experience and DAS score. Those who had pleasant experience showed higher DAS score compared to those who had unpleasant experience of their 1st dental visit as shown in Figure-1. The result of our study is not in accordance with study carried out by Oktay et al⁴⁰.

In this study, females reported slightly higher level of dental anxiety both in DAS and DFS. This finding is also in accordance with the findings by Peretz et al¹⁸ and Redi et al²⁶. The findings of Dental Fear

Table 4: Prevalence of Dental Fear/ Anxiety Internationally

Country	Level of High Dental Anxiety/Fear
Japan	20.9%
Singapore	7.8% - 20.8%
Denmark	4.2%
Iceland	4.8%
Netherlands	3.9% - 10.8%
Sweden	3.9% - 6.7%
Australia	13.7%
New Zealand	12.5% - 21.1%
United States	10% - 19%
Canada	4.4% - 16.4%

Survey (DFS) showed that seeing an anaesthetic needle (item 14) and feeling the needle injected (item 15) were the most anxiety provoking stimuli, followed by the items dealing with Drill (items 16, 17, 18). These results are in line with study carried out by Peretz et al¹⁸. These results are also in accordance with the study carried out by Redi et al²⁶.

However in the study carried out by Redi et al, scaling/ cleaning of teeth was ranked 3rd among others options of Anxiety provoking stimuli of Dental Fear Scale (DFS). On the other hand, scaling was 18th in the present study and in 12th place in study carried out by Peretz et al¹⁸. The pattern of Anesthetic injection leading to dental anxiety provoking stimuli, followed by Drill was also found by Wardle⁴¹.

The results of this study showed that 21.8% of the subjects of the sample were terrified, meaning they had dental phobia. While 16.3% were in the very afraid state of dental fear. These findings are much higher than the results (5.5%) presented by the Chanpong et al⁴². This high prevalence of Dental Fear of this study is in line with prevalence found in other countries like Japan, Singapore, New Zealand and United States as shown in Table-4⁴².

CONCLUSION

This data showed:

1. High prevalence of dental anxiety/fear in the study population.
2. Dental anxiety scores increased with increasing age in this study.
3. There is a significance difference of dental anxiety among males and females.
4. Females are more anxious as compared to their male counterparts.

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