Prevalence of Dental Anxiety among Patients Attending a Dental Educational Institution in Chennai, India – A Questionnaire Based Study

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Abstract

Objectives: Anxiety and fear towards dental treatment are common problems frequently experienced by patients worldwide, hence for better understanding, management and development of treatment strategies for dentally anxious patients, the present study was undertaken. The study aimed to evaluate the prevalence of dental anxiety and the factors influencing dental anxiety among the patients attending the outpatient department of a dental institution in India.

Method: 468 patients, 18-70 years were selected for the study. The assessment tools consisted of a consent form, history form, and a questionnaire form containing the Modified Dental Anxiety Scale which was used to assess the level of dental anxiety.

Results: Cronbach alpha for test retest samples was 0.863. The mean total anxiety score of the 468 samples was 10.29 (SD = 3.767). 3% were dentally phobic. One way ANOVA showed a significant difference between the age groups in relation to their mean total anxiety score ($p<0.05$) and it decreased with increasing age. Independent t test showed a highly significant difference in the mean total score between the patients with good and bad previous dental experience ($p<0.05$). Postponement of dental visit showed a significant positive correlation with anxiety score ($p<0.001$).

Conclusion: Tooth drilling for restorative purposes and local anaesthetic injections, were the most common reasons for dental anxiety. Younger respondents, uneducated, unemployed and lower income group were more anxious. The study also showed that postponement of dental visit and past negative dental experience were associated with higher anxiety scores.

Key Words: Dental Anxiety, Modified Dental Anxiety Scale, Negative Dental Experience, Self Perceived Oral Health

Introduction

Anxiety and fear towards dental treatment are common problems frequently experienced by patients worldwide. Despite the advances in technology, dental materials and increased oral health awareness, significant percentage of people suffer from dental anxiety. Dental anxiety is ranked fourth among common fears and ninth among intense fears [1]. Prevalence of dental anxiety has been studied among various populations and cultures and study results from developed countries have shown that fearful dental patients avoid dental treatment, seek emergency dental care, postpone their dental visit, have poor oral health related quality of life and more number of missing and decayed teeth [2,3]. Occurrence of dental anxiety has been attributed to factors like personality characteristics, traumatic dental experience in childhood (conditioning experiences), vicarious learning from dentally anxious family members or peers, perception of body image, blood injury fears and pain reactivity [4,5].

Dental anxiety is related to age, gender, educational qualification, socio economic status, culture and varies from person to person. Identifying dentally anxious patients is crucial for management and treatment outcome. These patients are characterised by their frequent postponement of appointments and when in the dental clinic, they sit on the edge of chair, keep fidgeting, pacing, show repetitive limb movement, have startled reaction to noise, have generalised muscle tension "white knuckle syndrome" and show eye fixation like "deer in headlights" [6].

Objective assessment of dental anxiety can be done using anxiety questionnaires like Corah's Dental Anxiety Scale (CDAS), Modified Dental Anxiety Scale (MDAS), Dental Fear Survey (DFS), State Trait Anxiety Scale (STAI), General Geer Fear Scale and Getz Dental Belief Survey. MDAS is more useful in a clinical setting for screening and diagnosing patients with dental anxiety, it was developed from CDAS [7]. It is a brief five item questionnaire, and contains multiple choice questions dealing with subjective reaction about going to the dentist, waiting in the dental clinic for treatment, anticipating drilling, scaling and local anaesthetic injection. Each item has five responses scored from 1-5 and the responses range in an ascending order from "not anxious" to "extremely anxious". It is simple and easy to complete and takes minimum time for completion [8]. Completion of the questionnaire does not increase patient fear, and has been shown to reduce state trait anxiety in clinical settings [9]. It has been found to be reliable and valid, cross culturally, and translated in different languages like Spanish [10], Greek [11], Chinese [12], Romanian [13] and Turkish [14].

Very few research papers have been published on the prevalence of dental anxiety and factors influencing dental anxiety among the south Indian Tamil speaking population [15-17]. Hence for better understanding, management and development of treatment strategies for these patients, the present study was undertaken. This study probes few such factors that make dental patients defer treatment which enables modification of the traditional treatment approaches.

Materials and Methods

The study was conducted from March 2012 to July 2012 on 468 patients attending the outpatient department of SRM

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Dental College and Hospital, Chennai. The study was cross sectional in design and convenience sampling was done. Ethical clearance was obtained from the institutional ethical committee. Patients aged 18-70 years, were included in the study. Patients who refused to give informed consent and those who were undergoing psychiatric therapy or were suffering from generalised anxiety disorders were excluded from the study. Written informed and verbal consent was obtained from all recruits.

The assessment tools consisted of a history form and a questionnaire form containing the MDAS which was used to measure the level of dental anxiety. It was administered in both Tamil and English language. The history form was used to obtain information on age, gender, educational qualification, occupation, income, history regarding previous visit to dentist, duration since the last visit to dentist, previous dental experience, self-perceived oral health status and postponement of dental treatment due to dental anxiety. Patients filled out the forms before their treatment in the waiting hall. Those patients who were uneducated and were unable to read were helped by an intern trained for the study purpose.

Survey questionnaire

The MDAS questionnaire was translated in Tamil and reliability and validity was established in a previously published research work [18]. Translation was done according to forward and backward blind translation process. The back translated versions were reviewed by the authors and the translated version was corrected along with the translators to eliminate any difference in the meaning between original version and back translated version. The final back translated version was pretested on the target Tamil speaking population. Final corrections were made to the translated Tamil version.

Test-retest

For checking the reliability of the translated questionnaire 30 patients attending the dental outpatient clinic were recruited for test-retest. The patients were informed about the study and those who consented were included. The patients were 18-70 years of age, from different socioeconomic status and different educational background. The patients completed the translated MDAS questionnaire on their first visit and they were given appointment after a week. All the 30 patients reported after one week and completed the same questionnaire.

Statistical analysis

Data was analysed using SPSS 16. Reliability was calculated using Cronbach alpha and intra class correlation. Correlation between the variables was assessed using Spearman rho correlation. Categorical data was analysed using chi square test. The independent t test and one way Analysis of variance (ANOVA) was used to study the difference in the groups based on their mean total anxiety score. Tukeys HSD was done for pair wise comparison in ANOVA.

Results

Cronbach alpha for test retest samples was 0.863. The intra

class correlation between the five items in the MDAS was 0.348 (95% CI, 0.224, 0.516, p<0.001). Spearman's rho correlation between the five items in first and second visit was 0.9, 0.83, 0.89, 0.89 and 0.92 respectively for question 1, 2, 3, 4 and 5 with p<0.001.

Table 1 show the variables assessed in the study. Among the 468 patients who completed the questionnaire, 305 were males and 163 were females. The mean age of the study population was 29(SD=11). The mean of the questions 1, 2, 3, 4 and 5 in the MDAS was 1.71, 1.76, 2.45, 1.74 and 2.64 respectively. The mean total anxiety score of the 468 samples was 10.29(SD=3.767). 3% of the patients were dentally phobic (total score 19 and more).

The study population was divided into three age groups and 69.7% of the samples were 18-30 years old. One way ANOVA showed a significant difference between the age groups in relation to their mean total anxiety scores (*Table 1*, p<0.05) and it decreased with increasing age. Spearman rho correlation showed a negative correlation between age and anxiety score (*Table 2*, p<0.001). Independent t test showed no difference in mean total score between males and females. Spearman rho correlation showed a positive correlation between gender and anxiety score (*Table 2*, p<0.05). Uneducated patients were dentally more anxious than educated patients. As the educational qualification of the patients increased from school to post graduation, the anxiety score showed a gradual increase (*Table 1*). Independent t test showed no significant difference in the anxiety score based on education (*Table 1*). Patients who had no income and income less than ten thousand rupees were dentally more anxious than those who had a higher income, Independent t test showed no significant difference in mean anxiety score within the group (*Table 1*). Spearman rho correlation showed a negative correlation between income and anxiety score (*Table 2*, p<0.05). Retired patients were dentally less anxious than the younger counterparts.

65.8% of study patients had visited a dentist once before and among them 7.14% had bad experience in their previous dental visit. The patients who had visited the dentist more than 1 year back scored high on the dental anxiety scale. The patients who reported having bad experience were dentally more anxious than those who had good dental experience. Independent t test showed a highly significant difference in the mean total score between the patients with good and bad previous dental experience (p<0.05). Patients who postponed their dental visit due to anxiety showed high scores on MDAS. Independent t test showed a significant difference in the mean anxiety score between patients with respect to their postponement of dental visit (p<0.001). Postponement of dental visit showed a significant positive correlation with anxiety score (*Table 2*, p<0.001). Majority of the patients 41.5% perceived their oral health as good. Patients who perceived their oral health as poor were dentally more anxious (mean total score 11.68, *Table 1*). *Table 2* shows the correlation between the variables. Spearman correlation showed a significant correlation between mean anxiety score and gender, age, income per month, postponement of

dental visit. Income and age showed a significant negative correlation with anxiety score.

Discussion

The present study was carried out to assess the dental anxiety level and the factors influencing dental anxiety among the Tamil speaking south Indian population. Test-retest for reliability and stability showed a good and acceptable internal consistency of 0.863. Cronbach alpha value for the Indian version of MDAS was 0.78 [19], Turkish version was 0.91

Table 1. Shows variables assessed in the study with sample size, percentage, mean total score and statistical test.

Variable	Number of samples	Percentage %	Mean total score	Statistical test p value
Age group				ANOVA
18-30 yr	326	69.7	10.59	F 3.466
31-50 yr	107	22.9	9.75	p<0.05*
≥ 51 yr	35	7.5	9.26	
Gender				t test
Male	305	65.2	10.08	t −1.728
Female	163	34.8	10.71	p>0.05
Education				ANOVA
School education	179	38.2	10.03	F 1.441
Degree/ Diploma	254	54.3	10.35	p>0.05
Post graduation	23	4.9	11.13	
Not educated	12	2.6	11.92	
Employment				ANOVA
Employed	247	52.7	10.05	F 2.491
Unemployed	42	8.97	10.64	p>0.05
Student	162	34.6	10.78	
Retired personnel	17	3.63	8.65	
Income				ANOVA
≤10000	186	39.7	10.1	F 1.575
11,000-15000	29	6.2	9.52	p>0.05
16000 -20000	15	3.2	9.93	
>20000	33	7.1	9.55	
Nil	205	43.8	10.76	
Oral Health				ANOVA
Excellent	80	17.1	10.04	F 0.198
Good	194	41.5	10.04	p>0.05
Average	175	37.4	10.55	
Poor	19	4.1	11.68	
Visit to dentist				t test
Yes	308	65.8	10.4	t 0.435
No	160	34.2	10.24	p>0.05
Previous dental visit experience				t test
Good	286	92.86	10.1	t 2.193
Bad	22	7.14	12	p<0.001**
Total score				
5-7	131	28	-	-
8-10	133	28.4	-	-
11-13	116	24.8	-	-
14-16	59	12.6	-	-
17-18	15	3.2	-	-
19-25	14	3	-	-
Postponement of dental visit due to dental anxiety				t test
Yes	82	17.5	11.95	t 4.472
No	386	82.5	9.94	p<0.001**
Time since last dental visit				ANOVA
Within 6 months	99	32.14	9.83	F 1.024
6-12 months	55	17.86	9.89	p>0.05
1-2yrs	55	17.86	10.71	
>2yrs	99	32.14	10.59	

Table 2. Shows the correlation between the variables assessed in the study.

Variables	Spearman Correlation	P
Gender and mean total score	0.97	0.036*
Age and mean total score	-0.152	0.001**
Education and mean total score	0.044	0.339
Income per month and mean total score	-0.132	0.004*
Self perceived oral health and mean total score	0.087	0.059
Postponement of dental visit and mean total score	0.199	0.000**
Postponement of dental visit and question 1 in MDAS	0.159	0.001**
Postponement of dental visit and question 2 in MDAS	0.176	0.000**
Postponement of dental visit and question 3 in MDAS	0.167	0.000**
Postponement of dental visit and question 4 in MDAS	0.134	0.004*

* $p < 0.05$
** $p < 0.001$

[14], Spanish version was 0.88 [10], Romanian was 0.90 [13], Greek was 0.90 [11], United Kingdom was 0.957 [20], the Chinese MDAS consisted of two factors: Anticipatory Dental Anxiety [ADA] and Treatment Dental Anxiety [TDA], the internal consistency coefficients were 0.74 and 0.86 respectively [12].

The mean total score was 10.29; this was similar to the anxiety level among study samples from Karnataka India [19], North West England [12] and Greece [11]. Anxiety towards tooth drilling and injection scored the highest mean score among the Tamil population and this was similar to the findings from other countries [21-23]. At the cut off value of ≥ 19 for MDAS score, 3% of the patients had extremely high level of dental anxiety; this was similar to the findings of Acharya et al. (2.2%) among Indian population [19]. The percentage of people with dental anxiety was less when compared with Western countries like UK (11%) [20], Northern Ireland (19.5%) [21], Turkey (23.5%) [14] and Finland (3%) [21].

The study showed no difference in the anxiety level between males and females, which is in agreement with the study by Santhosh kumar et al. [24], Economou GC [25], Thomson et al. [26]. The reason could be attributed to cultural differences. The results from this study showed that the mean anxiety score reduced with increasing age this is in agreement with the study by Acharya [19], Settineri et al. [27], Siyang Yuan [12] and contrary to the findings of Tunc [14] and Thomson [26]. Older individuals reported lesser anxiety and painful experiences than their younger counterparts, this age dependent waning in dental anxiety might be due to general decline in anxiety with aging and greater exposure to other diseases and their treatment [28]. Studies have shown that fears and phobias decline with age, which could be attributed to age dependent cerebral deterioration, factors like extinction or habituation, and adaptive resignation towards the inevitable [29,30]. The relationship between dental anxiety and socio economic status has not been clearly determined. In this study uneducated patients and patients with less or no income were more anxious; this is in accordance with other studies [22,31]. However, few studies have not found such a relationship [30]. The study showed that subjects who rated their oral health as poor had higher levels of dental anxiety than those subjects who rated their oral health as good or average, this was in accordance with the findings by Locker and Liddell

[30], Doerr et al. [32]. Contrary to the findings of Erten et al. [33], Skaret et al. [34], Hagglin et al. [35] the results from the present study showed no significant difference in dental attendance based on anxiety level and this was similar to the reports from Indian studies by Acharya [19], Ekta Malvania and Ajithrishnan [36] but contrary to the findings of Pavi et al. [37], Stole et al. [38]. Several factors other than dental anxiety influence dental service utilisation hence identifying those factors can throw more light on dental care seeking behaviour among this population. Among the patients who visited the dentist before, those who had a negative dental experience reported more level of anxiety which was in agreement with the study by Acharya [19], Moore et al. [22]. The pattern of visit to dentist shows that highly anxious patients made their last visit to dentist 2 years back, this is similar to the findings of Thomson et al. [3], Jason Armfield et al. [39]. Similar to the previous studies [34,35,39] our study showed that postponement of dental visit was significantly associated with anxiety level.

The limitations of the study are cross sectional design, convenience sampling, small sample size and use of self-assessment questionnaires. Self-administered questionnaires could be biased as there are chances that the individuals over or under estimate their responses (actual income, educational qualification, occupation).

Conclusion

It can be concluded from the present study that prevalence of dental anxiety was less in this south Indian Tamil speaking population and there was no gender differences in the anxiety level. Among the dental procedures, tooth drilling and local anaesthetic injection, were the most common reasons for anxiety. Younger respondents, uneducated, unemployed and lower income group were dentally more anxious. The study also showed that dentally anxious patients postponed their dental visit and past negative dental experiences were associated with significant anxiety scores.

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