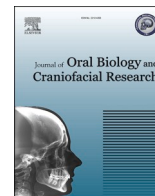




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## Journal of Oral Biology and Craniofacial Research

journal homepage: [www.elsevier.com/locate/jobcr](http://www.elsevier.com/locate/jobcr)

## To assess the prevalence of dental anxiety among patients visiting a teaching dental hospital in Lucknow, India and their self-perceived treatment needs

Khushboo Arif<sup>a,\*</sup>, Benazir Alam<sup>a</sup>, Mohammad Imran Khan<sup>b</sup>, Abhishek Khare<sup>c</sup>, Shitanshu Malhotra<sup>d</sup>, Brijendra Singh<sup>e</sup>

<sup>a</sup> Public Health Dentistry, Career Post Graduate Institute of Dental Sciences and Hospital, Ghaila, IIM Road Lucknow, UP, India

<sup>b</sup> Oral and Maxillofacial Pathology and Oral Microbiology, Career Post Graduate Institute of Dental Sciences and Hospital, Ghaila, IIM Road Lucknow, UP, India

<sup>c</sup> Head of Department, Oral and Maxillofacial Pathology and Oral Microbiology, Career Post Graduate Institute of Dental Sciences and Hospital, Ghaila, IIM Road Lucknow, UP, India

<sup>d</sup> Reader, Public Health Dentistry, Career Post Graduate Institute of Dental Sciences and Hospital, Ghaila, IIM Road Lucknow, UP, India

<sup>e</sup> Reader, Periodontics and Implantology Azamgarh Dental College, UP, India

### 1. Introduction

Dental anxiety is a multidimensional and complex experience which can be described as an aversive emotional state of apprehension in an anticipation of the feared stimulus of dental treatment. It can be exogenous which refers to acquisition from apathetic experience and endogenous that indicates individual personality traits such as susceptibility to generalized anxiety & mood disorders, psychoneurotic, self-consciousness.<sup>1</sup>

Dental fear is a “fight or flight” response to a known danger when affronted with a threatening stimulus.<sup>2</sup> It is important to metamorphose dental anxiety from phobia and fear: wherein phobia is feeling of fear that can cause impediment to daily activities while fear is emotional.

/physical response to what is recognized as a definite and immediate threat.<sup>3</sup> High levels of dental fear is associated with poor oral habits and quality of life, which was corroborated in a contemporary study.<sup>4</sup> It has been reported that individuals visit dentist irregularly due to higher dental anxiety which may lead to worsening in oral health.<sup>5</sup>

The prevalence of dental anxiety has been studied among various populations and cultures.<sup>6</sup> It is associated with poor self reported and clinically assigned oral health, more decayed and missing teeth and worse periodontal health. Oral health is important for physical and psychological well-being. There is evidence that oral health depends upon biological, social and environmental factors alongwith mental and physical health. Prolonged dental avoidance may lead to severe general health problems such as pneumonia, urinary tract infections, fever, septicemia, mediastinitis, intracranial extension of periapical abscess,

facial osteomyelitis, sinusitis and sepsis.

Dentist should be aware about anxiety level and behaviour of the patient, by taking measures to help pacify the anxiety during the operative procedures.<sup>7</sup>

Modified Dental Anxiety Scale (MDAS) comprises of 5 questions, each assessing the dental anxiety levels in different dental situations. All questions have 5 responses in Likert scale ranging from “not anxious” to “extremely anxious.”<sup>8</sup> Despite the advances in technology, dental materials, and increased oral health awareness, significant percentage of people suffer from dental anxiety. In array to prevent the potential of oral disease in adulthood it is important to figure out the aetiology of dental anxiety.<sup>9</sup>

For assessing level of dental anxiety, improved patient management and development of better treatment strategies for anxious dental patient, the present study was conducted among patients visiting in a teaching Dental hospital of Lucknow city (U.P.) India.

### 2. Materials and method

The present study was conducted with an aim to assess the prevalence of dental anxiety among patients visiting a teaching dental college of Lucknow city (U.P.) India and their self-perceived treatment needs. A Questionnaire based cross-sectional study was conducted on the patients visiting the out patient department on both male and female aged 18yrs and above, coming for any type of treatment to the hospital constituted the population of the study. A pilot study was conducted to check the feasibility and validity of the study on 50 subjects, using structured

\* Corresponding author.

E-mail addresses: [khushbooarif14@gmail.com](mailto:khushbooarif14@gmail.com) (K. Arif), [bena.alam@gmail.com](mailto:bena.alam@gmail.com) (B. Alam), [imranplz@yahoo.co.in](mailto:imranplz@yahoo.co.in) (M.I. Khan), [dr\\_abhi\\_khare@yahoo.co.in](mailto:dr_abhi_khare@yahoo.co.in) (A. Khare), [malhotra.shitanshu@yahoo.co.in](mailto:malhotra.shitanshu@yahoo.co.in) (S. Malhotra), [brijendrasingh.bds@gmail.com](mailto:brijendrasingh.bds@gmail.com) (B. Singh).

<https://doi.org/10.1016/j.jobcr.2022.09.007>

Received 13 August 2022; Received in revised form 1 September 2022; Accepted 8 September 2022

Available online 13 September 2022

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questionnaire based on MDAS. The participants of pilot study were excluded from the final analysis.

One study<sup>6</sup> advocating the significant prevalence of dental anxiety levels (29.2%) and factors associated with it among patients attending a dental teaching institute in Himachal Pradesh. Considering 5.0% margin of error and 80% power, the minimum sample size for the present study was calculated using the formula  $N = (1.96)^2 pq/d^2$ , where  $p = 0.29$  is the prevalence of dental anxiety among individuals,  $q$  is  $1-p$  i.e. 0.71,  $d$  is allowable error i.e. 0.05. Therefore, based on sample size calculation the representative sample size required was 316. With the expectation of a 10% of attrition rate, keeping in mind the drop-out rate and incomplete information, the final sample size was increased to 346. The sample size was increased to

Improve the external validity of the study. Random sampling technique was used to select the samples for the study for completing sample size of 346. Patients were selected through lottery method.

Patients aged 18yrs and above, gave consent, who were mentally and physically sound, who read and write English language were included, and who were in urgent need of treatment were excluded from the study. A written informed consent was obtained from each participant after explaining the methodology prior to enrolment in the study. The eligible and willing participants received the structured questionnaire in a printed form and complete anonymity and confidentiality was assured. It was approved by the Institutional ethical committee of the Career Post Graduate Institute of Dental Sciences & Hospital, Lucknow. The study was conducted from July 2021 to November 2021.

**Data Collection:** A structured, close-ended, peer-reviewed and pre tested questionnaire composed of 10 questions was designed to assess the anxiety levels of dental patients. Data was collected on each Monday, Wednesday & Saturday over a 5 month period.

The questionnaire consisted of three sections.

The first section consisted the demographic details, while the second section consisted questions based on Modified Dental Anxiety Scale, and the third section had questions about patients personal hygiene details. For the self-perception there was no standardized scale so to our satisfaction it was measured on the basis of percentage. The participants were given approximately 10–15 min time to answer all the questions of the questionnaire and return immediately to the research team. This was done to avoid any drop outs and to ensure that all the forms were received back.

### 3. Statistical analysis

Statistical analysis was done using SPSS version 22.0 (IBM Corp). The chi-square ( $\chi^2$ ) test was used for comparison of categorical data. Student's  $t$  test was used to compare mean age of two

Groups while comparison of mean scores of anxiety and self-perception was done by Mann Whitney  $U$  test (adjusted  $Z$  value).  $P < 0.05$  is considered statistically significant.

### 4. Results

The prevalence of dental anxiety was highest in 18–25 years (48.1%), followed by 26–40 years (47.7%) and more than 41 years the least (43.2%) (Fig. 1). Further, the prevalence of dental anxiety was higher in females (58.5%) than males (38.2%) (Fig. 2).

The scores of component of anxiety viz D1 (visit tomorrow), D2 (waiting room), D3 (Drill), D4 (scaling and polishing) and D5 (local anaesthetic injection) of all patients ranged from 1 to 5 with mean ( $\pm$ SD) 2.15  $\pm$  1.43, 1.58  $\pm$  1.32, 1.74  $\pm$  1.51, 0.93  $\pm$  1.21 and 3.20  $\pm$  1.23, respectively (Table 1). Similarly, the total anxiety (D1 + D2 + D3 + D4 + D5) scores of all patients ranged from 2 to 25 with mean ( $\pm$ SD) 9.60  $\pm$  5.99. The contribution of D5 on total anxiety was the highest (33.3%) followed by D1 (22.4%), D3 (18.1%), D2 (16.5%) and D4 (9.7%), the least (Table 1). Comparing the mean anxiety scores between the components, Friedman Test revealed highly significant ( $\chi^2 = 823.5$ ,  $p <$

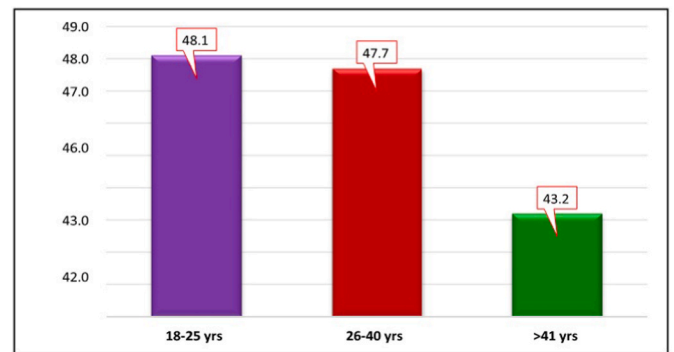


Fig. 1. Age wise prevalence of dental anxiety among study population.

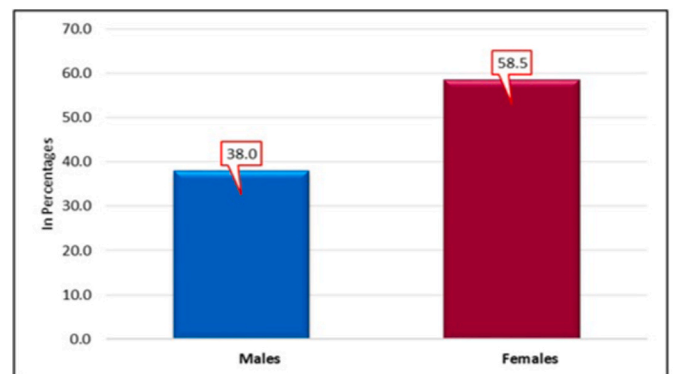


Fig. 2. Gender wise prevalence of dental anxiety among study population.

Table 1

Scores (Mean  $\pm$  SD) of components of dental anxiety and self perception of study population.

Anxiety (MDAS):	Males (n = 187)	Females (n = 159)	t/U value	p value
D1	1.93 $\pm$ 1.33 (22.6%)	2.42 $\pm$ 1.49 (22.3%)	-2.97	<b>0.003</b>
D2	1.37 $\pm$ 1.31 (16.1%)	1.82 $\pm$ 1.29 (16.8%)	-3.83	<b>&lt;</b> <b>0.001</b>
D3	1.48 $\pm$ 1.48 (17.3%)	2.05 $\pm$ 1.49 (18.9%)	-3.74	<b>&lt;</b> <b>0.001</b>
D4	0.83 $\pm$ 1.25 (9.8%)	1.05 $\pm$ 1.15 (9.7%)	-2.54	<b>0.011</b>
D5	2.94 $\pm$ 1.26 (34.4%)	3.49 $\pm$ 1.12 (32.3%)	-4.17	<b>&lt;</b> <b>0.001</b>
Total	8.56 $\pm$ 5.95 (100.0%)	10.84 $\pm$ 5.81 (100.0%)	-4.17	<b>&lt;</b> <b>0.001</b>
Self-perception:	Males (n = 187)	Females (n = 159)	t/U value	p value
P1	1.00 $\pm$ 0.98 (16.6%)	1.52 $\pm$ 1.35 (19.0%)	-3.46	<b>0.001</b>
P2	1.19 $\pm$ 1.08 (19.8%)	1.64 $\pm$ 1.12 (20.5%)	-3.72	<b>&lt;</b> <b>0.001</b>
P3	1.17 $\pm$ 1.09 (19.4%)	1.61 $\pm$ 1.15 (20.2%)	-3.63	<b>&lt;</b> <b>0.001</b>
P4	0.88 $\pm$ 1.23 (14.6%)	1.10 $\pm$ 1.12 (13.8%)	-2.67	<b>0.008</b>
P5	1.78 $\pm$ 1.11 (29.6%)	2.11 $\pm$ 1.24 (26.4%)	-2.30	<b>0.022</b>
Total	6.02 $\pm$ 4.53 (100.0%)	7.97 $\pm$ 4.95 (100.0%)	-3.77	<b>&lt;</b> <b>0.001</b>

0.001) difference among the scores of various anxiety components. Post hoc multiple comparison showed that the pairwise differences were significant for all the pairs except the pair D2-D3.

Similarly, the component of patients self assessed treatment need (perception) scores P1, P2, P3, P4 and P5 of all patients having mean (±SD) 1.24 ± 1.19, 1.40 ± 1.12, 1.37 ± 1.14, 0.98 ±

1.19 and 1.93 ± 1.18, respectively (Table 1). Further, the total perception (P1 + P2 + P3 + P4.

+ P5) scores of all patients ranged from 1 to 17 with mean (±SD) 6.91 ± 4.82. The contribution of P5 on total perception was the highest (27.9%) followed by P2 (20.2%), P3 (19.8%), P1 (17.9%) and P4 (14.2%), the least. Comparing the mean perception scores between the components, Friedman test revealed significantly (chi sq = 263.3, p < 0.001) different perception

Scores among the components. The Post hoc comparison showed that the Post hoc multiple comparison showed that the pairwise differences were significant for all the perception component pairs except the pair P1–P3, P1–P2 & P3–P2.

Comparing the mean scores dental anxiety and self perception components among males and female population (Table 2), Mann Whitney U test revealed significantly (p < 0.05) different and higher scores of all the components among females as compared to males. Further, the overall (D1 + D2 + D3 + D4 + D5) anxiety scores of females was also significantly (p < 0.05) different and higher than the males. The overall (P1 + P2 + P3 + P4 + P5) self -perception of treatment need score of females was also significantly (p < 0.05) different and higher as compared to males.(Table 2).

**5. Treatment needs**

When the correlation between dental anxiety and self-perception treatment needs was assessed it was found to be statistically significantly and positively correlated with all the components of MDAS and total MDAS as well (p < 0.001).(Table 3).

**6. Discussion**

Dental Anxiety is an increasing perceived problem towards dental procedures most often encountered by the dental practitioners. Dental treatment still exists as one of the most anxious visits, despite awareness among both the dentist and patient in building trusting relationships. It is more convoluted and exasperating treating the anxious patient for the dentist which may lead to bad oral health and poor periodontal status.<sup>10</sup>

Result showed 47.4% prevalence of dental anxiety in patients coming for check-up and various treatments. Prevalence reported in this study was higher than those reported by other studies conducted by Fotedar et al. (2016)<sup>6</sup> and Nicolas M et al. (2007)<sup>11</sup> where the prevalence of dental anxiety were (29.2% and 13.5%) respectively, which suggested that despite the

Technological advances made in the modern dentistry, anxiety associated with dental treatment was widespread in the study population that might be due to geographical variations.

The prevalence of dental anxiety was highest in18–25 years followed by 26–40 years and more than 41 years, the least. The results from the

**Table 2**  
Mean scores of different anxiety and self perception components among male and female population.

Pearson Correlation		P1	P2	P3	P4	P5	SelfPerception Total
MDAS total	r-value	.681	.868	.818	.909	.817	.986
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
D1	r-value	.751	.635	.560	.688	.771	.823
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
D2	r-value	.509	.921	.767	.838	.714	.901
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
D3	r-value	.627	.822	.878	.846	.741	.942
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
D4	r-value	.554	.719	.685	.979	.746	.888
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
D5	r-value	.584	.790	.765	.731	.675	.852
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

**Table 3**  
Correlation between Dental Anxiety and Self Perception treatment needs.

Components of anxiety (M-DAS):	Mean ± SD (n = 346)	Components of self perception (P):	Mean ± SD (n = 346)
Visit tomorrow (D1)	2.15 ± 1.43 (22.4%)	P1	1.24 ± 1.19 (17.9%)
Waiting room (D2)	1.58 ± 1.32 (16.5%)	P2	1.40 ± 1.12 (20.2%)
Drill (D3)	1.74 ± 1.51 (18.1%)	P3	1.37 ± 1.14 (19.8%)
Scale and polish (D4)	0.93 ± 1.21 (9.7%)	P4	0.98 ± 1.19 (14.2%)
Injection (D5)	3.20 ± 1.23 (33.3%)	P5	1.93 ± 1.18 (27.9%)
Total (M-DAS)	9.60 ± 5.99 (100.0%)	Total (P)	6.91 ± 4.82 (100.0%)

current study showed an inverse relationship between the age and dental anxiety score. The older individuals showed lesser anxiety than younger individuals, this was in agreement with the study done by Acharya et al. (2008),<sup>12</sup> and Abanto et al. (2017).<sup>13</sup> The possible reason behind lowering of dental anxiety among aged adults was due to increased exposures to diseases, overtime allowing patients to develop a tolerance to treatment. The similar findings were reported by Caltabiano (2018)<sup>4</sup> and Appukuttan et al. (2017)<sup>1</sup> where dental anxiety reduces with increasing age. Higher level of dental anxiety among 30–40 years age group were reported by Nadeem J et al. (2018)<sup>14</sup> and Thomson W et al. (2000).<sup>15</sup> Sinha et al. (2019)<sup>16</sup> reported that age has no effect on dental anxiety.

The prevalence of dental anxiety in the coeval study was higher in females than in males. Akin to this, Pohjola et al. (2016)<sup>17</sup> and Sinha et al. (2019)<sup>16</sup> reported higher levels of dental anxiety among females. Storjord et al. (2014),<sup>18</sup> and Hawamdeh et al. (2013)<sup>19</sup> reported no gender difference. Higher level of anxiety in females was due to the fact that females were more susceptible to perceived threats to danger and they being more able to express their feelings of fear more openly, while men are more stoic and hide their anxieties. In addition, physiologic conditions such as social phobia, panic, depression and stress are more common in females and dental anxiety may be associated with such emotions.

The M – DAS, a specially designed questionnaire was used in this study to investigate the participant’s level of anxiety towards specific dental procedures and also as an overall score to assess anxiety towards dentistry. A total M – DAS of 19 or more indicates a highly anxious dental patient who may even be dental phobic. The contribution of (local anaesthetic injection)

On total anxiety was the highest (33.3%). This is in accordance with the studies reported by Fayad et al. (2017)<sup>13</sup> where higher fear from dental injections was found. Highest anxiety for D5 was followed by D1

(visit tomorrow) (22.4%), D3 (Drill) (18.1%), D2 (waiting room) (16.5%) and D4(Scale and polish) (9.7%). The second highest anxiety reported was for D1 i.e. “If you had to go to the dentist tomorrow for a check-up, how would you feel about it” this result was different from those of previous studies, where the second most anxiety provoking after the injection was use of drill, this might be due to minimum invasive procedures by drills and vibrations that reduces dental fear and fear being met with a relatively pleasant treatment.

The component of patients self perception of treatment need scores P1, P2, P3, P4 and P5 of all patients ranged from 0 to 4, 0–1, 0–2, 0–2 and 1–5 respectively. The contribution of P5 on total perception was the highest (27.9%) and P4 (14.2%) the least. The overall health status of the mouth was scored as good while the health status of gums alone were scored as bad.

P3 for females was higher when compared to males. This result was observed because the females are more conscious of their oral health as compared to males. The contribution of P3 on self perception of treatment need was third after P5 which means an increased frequency of dental visits seems to decrease the anxiety level among patients. The self-perceived oral health status is likely to be influenced by individual preferences as well as socio-economic circumstances. The self-perceived oral health status is likely to be influenced by individual preferences as well as socio-economic circumstances. The present study was done on patients reporting to the hospital, majority of patients belong to a lower socio-economic group. The quality of life combined with the self-perceived oral health creates a self-perceived need for dental care. Oral problems such as dental pain and dental caries might have an impact on daily activities such as school, work, eating and sleeping etc which influence the quality of life.

The correlation between dental anxiety and self perception treatment needs was found to be statistically significant this might be due to the fact that patients were carefully handed by the dental students, and dental team operating the patients have positive behaviour which influences positive attitude and minimizes chances for dental anxiety. As, it is a cross-sectional study and includes a small sample size, it may limit its generalizability. Therefore, the study findings should not be generalized to patients in other Dental teaching institutions in the country because of the difference in demographic locations.

## 7. Conclusion

From the above findings, it can be concluded that dental anxiety was prevalent in major group of population. Results showed that 18–25 years of age group people had more anxiety towards dental treatment than older age group with females being more affected than males. Taking treatments into consideration anxiety was reported to be highest for injections and least for scaling and polishing. Taking self perceptions of oral health into consideration females were seen to be more conscious for their oral health than males. Further, the results showed that the use of patients self assessment was a good predictor of patient dental status. The information presented in the study could serve as a tool for public

and preventive dentistry, as well as to help the dental practitioner in managing patients according to their complaints and self assessment. The study findings could be utilized by the academicians, educators and administrators to plan strategies and programs to reduce Dental anxiety among patients.

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