



# Assessment of Dental Anxiety Levels in Patients undergoing Endodontic Treatment

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## ABSTRACT

**Introduction:** Dental anxiety may be defined as a state of unpleasant feeling combined with an associated feeling of impending doom or danger from within than from without. Anxious patients are difficult to manage and tend to avoid treatment.

**Aim:** The aim of the study is to evaluate the level of dental anxiety among patients undergoing endodontic treatment.

**Materials and methods:** Consent form and a pro forma of questionnaire [Modified Dental Anxiety Scale (MDAS)] in three different languages were used. The patients undergoing endodontic treatment were first explained about the study and how the study would be carried out with a sample size of 250 patients. The minimum score of 5 and the maximum score of 25 was considered for evaluation. Cut off at 19 or above indicates a highly dentally anxious patient.

**Statistical analysis:** Analysis was done using the Student's t-test and Kruskal–Wallis test.

**Results:** There were significant differences in the level of anxiety between male and female patients when the tooth was about to be drilled, when the teeth were about to be scaled, and when the local anesthetic was to be administered ( $p = 0.05$ ,  $0.02$ , and  $0.06$  respectively), except for anxiety levels a day prior to treatment and when patients were in the waiting room, which was not significant ( $p = 0.46$  and  $0.14$  respectively).

**Conclusion:** In general, it was observed that patients are slightly anxious related to dental appointments and fairly anxious when related to treatments. Female patients tend to be more anxious than men, and patients in age group below 25 years are more anxious than other age groups.

**Keywords:** Dental anxiety, Endodontic treatment, Modified dental anxiety scale, Survey.

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## INTRODUCTION

Good oral health is an essential part of good general health and well-being throughout life. Oral health status can be achieved, promoted, and maintained by receiving appropriate professional dental care, as well as by practicing proper self-care and participating in community-based prevented dental programs.<sup>1</sup>

The terms dental anxiety and dental phobia have not been used uniformly in the relevant literature and the border between them is blurred. Dental anxiety and pathological dental phobia terminologies need to be differentiated. They are defined as follows: Dental anxiety is the term used to apply all the psychological and physiological variations of a more or less strong but not logical feeling of fear in conjunction with the dentists appointment or a stimulant relating to a dental treatment.<sup>2</sup>

Pathological dental phobia is characterized by the avoidance of dental treatment in addition to a high level of anxiety. A survey shows sizeable amount of proportion of people avoids visiting dentists because they are too frightened to do so.<sup>3</sup> At a dentist's office, both normal fear and dental phobia are omnipresent and have significant influence on dental treatment.

Despite the technological advances in dentistry, anxiety about dental treatment and the fear of pain associated with dentistry remain globally widespread and is considered a major barrier to dental treatment.<sup>4</sup> Dental fear is a normal protective reaction to a real threat and the feeling of fear does not remain when the threat is no longer present. Dental anxiety on the contrary is more of a subjective state of a feeling that is often associated with a feeling of impending doom or danger.<sup>5</sup> Patients are more concerned with and feel more ashamed about telling the dentist that they are dentally anxious.<sup>6</sup>

Dental anxiety is a major hurdle when it comes to seeking early advice regarding oral and dental problems.<sup>7</sup> It is common observation that anxious patients differ from visit to dental practices till the time it becomes absolutely necessary to obtain dental treatment.<sup>8</sup> Therefore, anxious patients suffer from inferior or are held as compared with nonanxious patients.<sup>9</sup> Avoidance of dental

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treatment due to dental anxiety not only situate the oral health of the patient at risk but also poses a severe threat to his/her general health and the patient can suffer from a number of serious medical conditions like septicemia, sepsis, sinusitis, and osteomyelitis of the face.<sup>10</sup>

Various dental procedures evoke an anxiety response in an individual ranging from minor scaling to a surgical procedure. However, extraction and root canal treatment were found most frightening.<sup>11</sup> A survey of American Association of Endodontists shows general perception of public for endodontic therapy is negative because of the associated pain: Preoperative, during, and postoperative.<sup>11</sup> In addition, the personal characteristics of the patients also affect the dental anxiety.<sup>12,13</sup>

Data availability regarding anxiety associated with various dental treatment and variations in different populations is scanty. If dentist are aware of the level of anxiety of the patients, they can anticipate the patient's behavior and be prepared to take measures to help alleviate the anxiety.<sup>14</sup> However, similar such surveys in India are very few and hence this survey will assess the anxiety levels of patients undergoing endodontic treatment.

Thus, the aim of the survey was to assess the level of dental anxiety among patients undergoing endodontic treatment, with the objectives of the survey being:

- To assess the level of dental anxiety among patients
- To compare the level of dental anxiety among gender
- To compare the level of dental anxiety based on age groups

## MATERIALS AND METHODS

This survey was conducted at Mahatma Gandhi Mission (MGM) Dental College and Hospital, Navi Mumbai, India, with a sample size of 250 participants.

Ethical clearance was obtained from the Institutional Ethics and Review Committee. Patients reporting at the Outpatient Department of Conservative Dentistry and Endodontic and undergoing endodontic treatment were enrolled in the survey. The provisional diagnosis of the patient was verified by the senior faculty of the concerned department. The sample size was derived by using the previous study,<sup>15</sup> considering the power 80% with an alpha error of 5%. The minimum required sample size was estimated to be 250.

Male and female patients in the age group ranging from 15 to 65 years were selected to complete the required sample size for the study.

Patients with known history of anxiety-related disorders and patients with nonendodontic treatment like scaling, extraction, denture requirement, and restorations were excluded from the survey.

The selected patients were first explained about the survey and consent was obtained from them.

The participants were given the self-administered questionnaire in the waiting area of the department just before the start of their treatment.

All the demographic details were obtained once the participant filled the questionnaire.

The level of anxiety was evaluated by using the MDAS.<sup>16</sup>

Translation of the MDAS<sup>16</sup> was carried out to adapt it to the local language by using back-translation method. Face validity of this back-translated scale was evaluated on five patients and test-retest reliability (inter-rated kappa = 0.77) was obtained.

The MDAS has five questions with attributes related to the level of the anxiety of the patient: On previous day of treatment, before, and during treatment. The five questions are as follows:

1. If you went to your dentist for treatment tomorrow how would you feel?
2. If you were sitting in the waiting room (waiting for treatment) how would you feel?
3. If you were about to have a tooth drilled how would you feel?
4. If you were about to have your teeth scaled and polished how would you feel?
5. If you were about to have a local anesthetic injection in your gum, above an upper back tooth how would you feel?

The assessment of anxiety levels was done with the help of scores as follows: Not anxious = 1, slightly anxious = 2, fairly anxious = 3, very anxious = 4, extremely anxious = 5. The scores of all five responses were added which can range from minimum 5 to maximum 25, with a cut-off of 19 or above, which indicates a highly dentally anxious patient, possibly dentally phobic.

## RESULTS

The present study was carried out with 250 of population, having a total of male 108 and female 142. According to the age group, there were 77 individuals below 25 years of age, 83 were between 26 and 35 years of age, 43 from 36 to 45 years of age, 29 were 46 to 55 years of age, and 17 were 56 to 65 years of age.

Table 1 shows the general distribution of the level of anxiety among all the patients. It was observed that patients are slightly anxious a day before their appointments (43.2%), when they were sitting in the waiting room (40.4%), as well as when they were about to have their tooth drilled (33.2%). The maximum (32.4%) number of patients were not anxious when they were about to have their teeth scaled and polished; 29.6% of patients were fairly anxious when they were about to have a local anesthetic injection.

**Table 1:** General distribution

	<i>Not anxious</i>		<i>Slightly anxious</i>		<i>Fairly anxious</i>		<i>Very anxious</i>		<i>Extremely anxious</i>	
	<i>Count</i>	<i>%</i>	<i>Count</i>	<i>%</i>	<i>Count</i>	<i>%</i>	<i>Count</i>	<i>%</i>	<i>Count</i>	<i>%</i>
Q1	83	33.2	108	43.2	45	18.0	12	4.8	2	0.8
Q2	82	32.8	101	40.4	48	19.2	16	6.4	3	1.2
Q3	51	20.4	83	33.2	76	30.4	33	13.2	7	2.8
Q4	81	32.4	77	30.8	60	24.0	27	10.8	5	2.0
Q5	30	12.0	73	29.2	74	29.6	48	19.2	25	10.0

**Table 2:** Sex-wise comparison and basic data distribution

		<i>Not anxious</i>		<i>Slightly anxious</i>		<i>Fairly anxious</i>		<i>Very anxious</i>		<i>Extremely anxious</i>	
		<i>Count</i>	<i>%</i>	<i>Count</i>	<i>%</i>	<i>Count</i>	<i>%</i>	<i>Count</i>	<i>%</i>	<i>Count</i>	<i>%</i>
Male	Q1	44	40.7	45	41.7	15	13.9	3	2.8	1	0.9
	Q2	40	37.0	46	42.6	15	13.9	7	6.5	0	0
	Q3	27	25.0	33	30.6	35	32.4	9	8.3	4	3.7
	Q4	39	36.1	31	28.7	24	22.2	11	10.2	3	2.8
	Q5	18	16.7	35	32.4	29	26.9	18	16.7	8	7.4
Female	Q1	39	27.5	63	44.4	30	21.1	9	6.3	1	0.7
	Q2	42	29.6	55	38.7	33	23.2	9	6.3	3	2.1
	Q3	24	16.9	50	35.2	41	28.9	24	16.9	3	2.1
	Q4	42	29.6	46	32.4	36	25.4	16	11.3	2	1.4
	Q5	12	8.5	38	26.8	45	31.7	30	21.1	17	12.0

**Table 3:** Mann–Whitney U-test results

<i>Sex</i>	<i>n</i>	<i>Mean rank</i>				
		<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Q5</i>
Male	108	113.17	116.36	118.88	121.66	113.24
Female	142	134.88	132.45	130.53	128.42	134.83
Total	250					
Mann–Whitney U-test p-value		0.461	0.141	0.051	0.021	0.066

Table 2 shows the sex-wise comparison and the basic data distribution of the level of anxiety among the patients. A day before treatment maximum male patients were not anxious (40.7%) as compared with female patients who were slightly anxious (27.5%). When in the waiting room maximum male patients were not anxious to slightly anxious (37–42% respectively), whereas maximum female patients were slightly anxious to fairly anxious (38.7–23.2% respectively). When the tooth was about to be drilled, male patients were slightly anxious to fairly anxious (30.6–32.4% respectively), whereas female patients were slightly anxious to very anxious (35.2%, 28.9–16.9%). When teeth were about to be scaled and polished, maximum male patients were not anxious to slightly anxious (36.1–28.7% respectively), whereas female patients were slightly anxious to fairly anxious (32.4–25.4% respectively). When local anesthetic was to be administered, males were slightly anxious to fairly anxious (32.4–26.9% respectively), whereas female patients were fairly anxious (31.7%).

Table 3 shows that there were no statistically significant differences when the anxiety, a day prior to treatment,

was recorded and when patients were in waiting room (p-value 0.46 and 0.14 respectively). There were significant differences in the levels of anxiety between males and females when the tooth was about to be drilled, when the teeth were about to be scaled and polished, and when local anesthetic was to be administered (p-value: 0.05, 0.02, and 0.06 respectively).

Table 4 shows age group-wise comparison and basic data distribution and it is observed that:

- In the age group of 25 years and below, most of the patients were slightly anxious 1 day prior and when they were sitting in the waiting room, whereas it was found that they were fairly anxious when tooth was about to be drilled and local anesthetic was to be administered (33.8, 26% respectively). Most of the patients were slightly anxious (29.9%) when they were about to have their teeth scaled and polished.
- A similar pattern of anxiety was seen in the age group of 26 to 35 years. It was observed that most of the patients were slightly anxious (44.60%), 1 day prior and when they were sitting in the waiting room (42.20%), whereas it was found that they were fairly anxious

**Table 4:** Age group-wise comparison and basic data distribution

		25 and below (%)	26–35 (%)	36–45 (%)	46–55 (%)	56 and above (%)
Q1	Not anxious	27.30	34.90	46.50	27.60	29.40
	Slightly anxious	44.20	44.60	30.20	48.30	52.90
	Fairly anxious	20.80	15.70	16.30	24.10	11.80
	Very anxious	6.50	4.80	4.70	0	5.90
	Extremely anxious	1.30	0	2.30	0	0
Q2	Not anxious	27.30	30.10	37.20	48.30	35.30
	Slightly anxious	40.30	42.20	41.90	37.90	29.40
	Fairly anxious	23.40	16.90	14.00	13.80	35.30
	Very anxious	9.10	7.20	7.00	0	0
	Extremely anxious	0	3.60	0	0	0
Q3	Not anxious	16.90	19.30	37.20	13.80	11.80
	Slightly anxious	26.00	32.50	30.20	58.60	29.40
	Fairly anxious	33.80	34.90	18.60	13.80	52.90
	Very anxious	19.50	12.00	9.30	10.30	5.90
	Extremely anxious	3.90	1.20	4.70	3.40	0
Q4	Not anxious	23.40	31.30	48.80	37.90	29.40
	Slightly anxious	29.90	28.90	20.90	44.80	41.20
	Fairly anxious	26.00	26.50	18.60	17.20	29.40
	Very anxious	18.20	10.80	9.30	0	0
	Extremely anxious	2.60	2.40	2.30	0	0
Q5	Not anxious	10.40	9.60	20.90	10.30	11.80
	Slightly anxious	24.70	26.50	37.20	31.00	35.30
	Fairly anxious	26.00	32.50	16.30	41.40	47.10
	Very anxious	24.70	20.50	16.30	13.80	5.90
	Extremely anxious	14.30	10.80	9.30	3.40	0

when tooth was about to be drilled (34.9%) and when local anesthetic was to be administered (32.5%). Most of them were slightly anxious (28.9%) when they were about to have their teeth scaled and polished.

- In the age group of 36 to 45 years, it was noted that patients were slightly anxious 1 day prior to treatment (46.5%) and slightly anxious when they were sitting in the waiting room (41.90%). When the tooth was about to be drilled they were not anxious to slightly to fairly anxious (37, 20, 30.2, and 18.6% respectively). When the patients were about to have their teeth scaled, most of them were not anxious (48.8%) and when local anesthetic was to be administered, most of them were slightly anxious (37.2%).
- In the age group of 46 to 55 years, it was observed that 48.30% patients were slightly anxious 1 day prior to treatment. Whereas when they were sitting in the waiting room, 48.30% patients were not anxious. When the tooth was about to be drilled and teeth were about to be scaled and polished, most of them were slightly anxious (58.6 and 44.8% respectively), whereas most of them (41.4%) were fairly anxious when local anesthesia was about to be administered.
- In the age group of 56 years and above, patients were slightly anxious 1 day prior to treatment (52.9%), whereas an equal distribution of anxiety (35.3% each not anxious and fairly anxious) was observed when they were in the waiting room. When the tooth was

about to be drilled and when local anesthetic was about to be administered, most of the patients were fairly anxious (52.9 and 47.10% respectively). When the teeth were about to be scaled and polished, most of the patients were slightly anxious (41.2%).

Table 5 shows the mean rank and the age groups, and it is observed that there was significant difference in the level of anxiety when different age groups were concerned. The statistical difference was observed when the patients were about to have their tooth drilled (p-value: 0.051), when the teeth were about to be scaled and polished (p-value: 0.021), and when local anesthetic was about to be administered (p-value: 0.066).

## DISCUSSION

This study was carried out in order to assess the level of anxiety among patients undergoing endodontic treatment in the age group of 15 to 65 years.

The study consisted of 108 males and 142 females with a total of 250 patients reporting to the Department of Conservative Dentistry and Endodontics, MGM Dental College and Hospital, Navi Mumbai, India, requiring endodontic treatment after diagnosis.

It was observed that irrespective of age and gender, patients were slightly anxious 1 day prior to the appointment (43%), when they were sitting in the waiting room (40%) and when the tooth was about to be drilled (33%). Most of the patients had their anxiety varying from

Table 5: Mean ranks

Age groups (years)	n	Mean rank				
		Q1	Q2	Q3	Q4	Q5
25 and below	77	135.12	134.62	139.94	142.4	137.58
26 to 35	83	120.75	129.41	125.22	128.1	131.27
36 to 45	43	112.64	116.36	102.01	107.15	105.38
46 to 55	29	129.14	98.78	113.33	101.45	115.79
56 and above	17	124.15	126.5	134.35	116.41	102.74
Kruskal–Wallis p-value		0.461	0.141	0.051	0.021	0.066

not anxious to slightly anxious when they were about to have their teeth scaled and polished (32.4 and 30.8% respectively), whereas most of the patients had anxiety ranging from slightly anxious to fairly anxious (29.2 and 29.6% respectively) and when they were about to have a local anesthetic injection to be administered. In general, it shows that the patients were more anxious, where invasive treatment was to be carried out (Table 1).

It was also observed that the level of anxiety among maximum male patients ranged from not anxious to slightly anxious (40.7–41.7% respectively) 1 day prior to the appointment and also when they were in the waiting room (37–42.6% respectively), whereas anxiety level ranged from slightly anxious to fairly anxious when their tooth was about to be drilled. Maximum among them had slight anxiety when teeth were about to be scaled and polished and when local anesthetic solution was about to be administered.

Among the female patients, most of them were slightly anxious: 1 day prior to the appointment (44.4%), also when they were in waiting room (38.7%), the tooth was about to be drilled (35.2%), and teeth were to be scaled and polished (32.4%), whereas 31.7% female patients were fairly anxious when local anesthetic solution was to be administered (Table 2).

When the tooth was about to be drilled and when local anesthetic was to be administered, the level of anxiety was observed to be considerably more in both male and female patients than when teeth were about to be scaled and polished. Statistically significant difference was found between the genders (Table 3).

With regard to the anxiety levels, it was observed that in the age group of 15 to 25 years and 26 to 35 years, both had almost similar pattern level of anxiety for all the five parameters (questionnaire), whereas in the age group of 36 to 45 years, it was observed that the level of anxiety was considerably low; however, the level of anxiety was seen to be high in the age group of 46 to 55 years and 56 to 65 years (Table 4).

Assessing the individual parameters, it was observed that:

- Patients 1 day prior to treatment, patients in the age group from 15 to 25 years, 26 to 35 years, 46 to 55 years,

and 56 to 65 years were all slightly anxious, whereas most of the patients in the age group of 36 to 45 years were not anxious. It was observed that the difference between the levels of anxiety was not significant statistically (p-value: 0.46).

- When the patients were sitting in the waiting area, it was found that patients in the age group from 15 to 25, 26 to 35, 36 to 45, and 56 to 65 years were slightly anxious, whereas patients in the age group of 46 to 55 years were not anxious (p-value: 0.141). This was not statistically significant though there was difference in the level of anxiety.
- When the tooth was about to be drilled, patients between the age group from 15 to 25, 26 to 35, and 56 to 65 years were fairly anxious, whereas patients between 36 and 45 years were not anxious and patients in the age group between 46 and 55 years were slightly anxious. The level of anxiety was high in both the extremes of the age groups (p-value: 0.05), which was statistically significant.
- When the tooth was about to be scaled and polished, patients in the age group of 36 to 45 years were not anxious, whereas all the other age groups were slightly anxious (p-value 0.02), which was statistically significant.
- When the local solution was about to be administered, all the age group patients were fairly anxious except 36 to 45 years of age who were slightly anxious (p-value: 0.066), which was not significant statistically. Since the p value is very close to having statistically significant difference, one can interpret that the middle-age group was less anxious when compared with others (Table 5).

In general, it was observed that the level of anxiety was high for invasive procedure, such as tooth drilling and local administration. In comparison, the level of anxiety was comparatively low when patients were sitting in the waiting area and 1 day prior to the treatment. The noninvasive procedure of scaling and polishing evoked low anxiety. The results of this study are in agreement with another conducted in India.<sup>3</sup>

According to gender, the female patients were more anxious as compared with male patients, which was observed to be significant. Psychological and medical research on human responses to pain stimuli have found

that women report higher levels of anxiety and exhibit less tolerance to pain at given stimulus intensities than men.<sup>14</sup> The results of the present study also showed that women patients had higher anxiety level. This may be because women are more likely to self-report their anxiety. Another survey shows that women have a lower tolerance to pain and generally report higher levels of anxiety and that the gender differences relating to the dental anxiety that have been reported may not only be numerical but also qualitative in their nature.<sup>17</sup> Another reason for this gender trend could be that males tend to hide their fear due to the conventional gender role, which has been reported earlier by Pierce and Kirkpatrick.<sup>18</sup> A survey by Wong and Lytle<sup>19</sup> did not find any significant gender differences when the root canal therapy or extraction was carried out. They showed that such a difference exists only in low-anxiety procedures like cleaning or examination where female patients are more anxious. According to the present study, female patients were significantly anxious than that of male patients irrespective of the procedure carried out.

According to the various age groups in the current study, the age group 35 to 45 years was significantly less anxious for all the parameters as compared with the age groups of 15 to 25, 26 to 35, 46 to 55, and 56 to 65 years. The results of this study are not in agreement with the results of Liddell and Locker,<sup>20</sup> who reported lower anxiety in older age group than their counterparts, the reason being a general decline in anxiety with aging and greater exposure to other diseases and their treatment. Peretz and Moshonov<sup>15</sup> in their study reported that an anxiety level among patients undergoing endodontic treatment was highest in the age group of 31 to 46 years and lowest in the age group of 47 to 63 years. It is thus observed from some of the above-mentioned studies that there is a variation in the anxiety levels and the age groups.

Modified Dental Anxiety Scale was chosen in the current study as it is more useful in a clinical setting for screening and diagnosing patients with dental anxiety. It was developed from Corah's Dental Anxiety Scale.<sup>21</sup>

Patients requiring endodontic treatment will present with high anxiety and they should be managed appropriately, which should include behavioral management and various aids to alleviate the anxiety level. Similar study with a larger sample size should be carried out in various aspects of endodontic treatment to screen the anxiety levels out of all these patients and offer them adequate treatment with the minimum of discomfort.

## CONCLUSION

In the current study, it was observed that female patients were more anxious than male patients. Overall, it was observed that the age group of 25 years and below was the

most anxious and the age group of 36 to 45 was the less anxious, for the various parameters tested in the study.

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