

Assessment of Dental Anxiety Among Patients Visiting for Endodontic Treatment in a Tertiary Care Hospital

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Article History

Received: 1st April, 2026

Acceptance: 24th June, 2026



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Abstract

Introduction: Dental anxiety is a significant concern for both dentists and patients. Till date, no study has been conducted in Nepal about dental anxiety during Root canal Treatment (RCT). Therefore, the aim of this study was to evaluate dental anxiety among patients undergoing endodontic Treatment in a Tertiary care hospital

Methods: A total of One hundred twelve patients presenting for an endodontic visit were recruited for the study. A questionnaire was administered and Modified Dental Anxiety Scale (MDAS) was used as an assessment tool to record level of anxiety. Data were analyzed in SPSS version 24. Mean anxiety scores before and after treatment were compared using paired t test, difference between males and females were analyzed using independent t-test while comparisons among different age groups were performed using one way ANOVA followed by Post Hoc tukey test.

Results: Anxiety was detected more frequently in females than in males both before treatment ($p < 0.001$) and after treatment ($p = 0.020$). Before endodontic treatment, the mean dental anxiety score was 10.13 ± 2.95 , which significantly reduced to 8.28 ± 2.53 after treatment. There was statistically significant reduction in dental anxiety following treatment ($t = 7.19, p < 0.001$).

Conclusions: Females are more anxious than males while receiving endodontic treatment. The mean dental anxiety score was usually reduced after the first endodontic session. This shows that clinicians can significantly reduce patient distress with effective pain management.

keywords: dental anxiety, endodontic, root canal treatment, modified Dental Anxiety Scale

Introduction

Dental anxiety is the most common disorder that hinders patients' 'ability to comply with the dental treatment leading to avoidance of dental care.¹ Anxiety is the main reason for delaying or canceling appointments which impacts the quality of oral health.² Many studies suggests that nonsurgical endodontic treatment can also influence dental anxiety.³ American Association of endodontists showed that public perceptions of root canal treatment were not positive due to complain of pain associated with the endodontic procedures.⁴ Age and gender may influence level of dental fear and anxiety during the endodontic treatment. It has been reported that anxious patients tend to have lower pain thresholds, especially in the oral region.⁵ Anxious patients tend to overestimate pain,

and require more chairside time for stress reduction. This extra chairside time could potentially increase level of stress experienced by both the patient and the dentist. Previous research on dental anxiety has focused on comprehensive dental treatment. No studies have been conducted on dental anxiety associated with endodontic treatment in Nepal. Hence, the present study aimed to assess anxiety levels before and after endodontic treatment.

Methods

This study was conducted at Department of Dentistry, Pokhara Academy of Health Sciences, Pokhara, Nepal from May, 2025 to October 2025 AD with a sample size of 112 participants. Ethical clearance was obtained from the Institutional Review Committee (ref-97/081) at Pokhara Academy of Health

How to Cite this Article in Vancouver Style:

Tripathi R, Dahal S, Lamsal S, Gelal B, Nepal M, et.al. Assessment of Dental Anxiety Among Patients Visiting for Endodontic Treatment in a Tertiary Care Hospital. Med. J. Pokhara A. Health Sci. 2026;9(1):30-33.

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Sciences on 27th April 2025 AD. Patients reporting to the Out-patient Department of Dental Surgery undergoing endodontic treatment were enrolled in the study. The provisional diagnosis of the patient was verified by the two endodontists of the concerned department. Convenience sampling technique was used for the selection of participants.

The minimum required sample size was estimated to be 112. Male and female patients in the age group ranging above 18 years were selected. In this study, the patient who could give written and verbal consent along with appointment for non surgical root canal treatment were included. Each patient with known history of anxiety-related disorders, Pregnant females, unwilling or unable to provide verbal consent, Subject with special needs and patients with no endodontic treatment like scaling, extraction, denture requirement, and restorations were excluded from the study.

The sample size was derived by using the previous study⁶

Sample size has been calculated using formula

$$n = \frac{z^2 \sigma^2}{(e \text{ of mean})^2}$$

where, n= sample size

$$Z \alpha/2 = 1.96$$

σ = standard deviation = 3.03

e = margin of error = 0.05

Mean = 12.296

Placing these values in the formula provided above,

$$n = 93.31$$

$$\text{Adding 20 \% non-response rate, Total sample} = 111.97 \\ = 112$$

The selected patients were first explained about the study and consent was obtained from them. A reliable and valid Nepali version of MDAS (Modified Dental Anxiety Scale)⁶ was used as an assessment tool to assess dental anxiety of patients. A MDAS is the most commonly used questionnaire and has a good cross-cultural reliability and validity. MDAS consists of 5 questions each with a 5-category rating scale, ranging from 'not anxious' to 'extremely anxious'. Data analysis was done with the SPSS for windows, version 24. The critical level of significance was set at $p < 0.05$, while the confidence interval was 95%.

Mean, standard deviation for quantitative data and frequency, percentage for categorical data were computed. Paired t-test was performed to determine the difference mean anxiety scores before and after treatment. Independent t-test was done to determine the difference in mean anxiety scores among males and females. One way ANOVA was done to determine the difference in mean anxiety scores among different age groups. Post Hoc tukey test was done for further pairwise comparison in between different age groups.

Results

A total of 112 patients undergoing root canal treatment with mean age of 35.17 ± 16.79 years (minimum age = 18 years, maximum age = 70 years) were included in the study. Among them, 61 (54.5%) were males and 51 (45.5%) were females. The largest proportion of participants belonged to the ≤ 25 years age

group (43, 38.4%), followed by 26–35 years as shown in table 1 (24, 21.4%).

Table 1: Demographic characteristics of the study participants (n = 112).

Variable	Category	Frequency (f)	Percentage (%)
Sex	Male	61	54.5
	Female	51	45.5
Age in years	≤ 25	43	38.4
	26–35	24	21.4
	36–45	18	16.1
	46–55	14	12.5
	≥ 56	13	11.6

The mean dental anxiety score before treatment was 10.13 ± 2.95 , which significantly reduced to 8.28 ± 2.53 after treatment. Paired t-test analysis showed a statistically significant reduction in dental anxiety following treatment as shown in table 2 ($t = 7.19$, $p < 0.001$).

Table 2: Comparison of dental anxiety scores before and after treatment (n = 112).

Variable	Mean $\pm$ SD	Mean Difference	t	df	P value
Anxiety score before treatment	10.13 ± 2.95	1.85 ± 2.72	7.19	111	<0.001*
Anxiety score after treatment	8.28 ± 2.53				

Table 3 demonstrates the comparison of dental anxiety scores by gender before and after treatment. Female patients demonstrated significantly higher dental anxiety scores than males both before treatment ($p < 0.001$) and after treatment ($p = 0.020$).

Table 3: Comparison of dental anxiety scores by gender before and after treatment (n = 112).

Anxiety score	Sex	Mean $\pm$ SD	p-value*
Before treatment	Male	9.05 ± 2.54	<0.001
	Female	11.41 ± 2.91	
After treatment	Male	7.77 ± 2.65	0.020
	Female	8.88 ± 2.26	

*Independent t test

Table 4 shows the comparison of dental anxiety scores by age groups before and after treatment. No statistically significant difference was observed in pre-treatment dental anxiety scores across different age groups ($p = 0.103$) but post-treatment anxiety scores differed significantly ($p = 0.019$). However, multiple pairwise comparisons using post-hoc Tukey test did not show significant differences between any of the groups during post-treatment as shown in Table 5 ($P > 0.05$).

Table 4: Comparison of dental anxiety scores among different age groups (n = 112).

Age in years	Category	Before treatment	After treatment
	≤25	11.02 ± 2.91	9.28 ± 2.96
	26–35	9.38 ± 3.81	7.63 ± 2.45
	36–45	9.22 ± 1.48	7.94 ± 1.76
	46–55	9.64 ± 3.56	7.64 ± 2.31
	≥56	10.31 ± 0.85	7.31 ± 0.85
F	-	1.98	3.07
P value*	-	0.103	0.019

*One way ANOVA

Table 5: Multiple comparison of dental anxiety scores within different age groups (n = 112).

Age in years		Mean difference	Standard error	P value*
≤25	26–35	1.65	0.62	0.067
	36–45	1.33	0.69	0.299
	46–55	1.64	0.75	0.196
	≥56	1.97	0.77	0.087
26–35	36–45	-0.319	0.76	0.993
	46–55	-0.018	0.82	>0.99
	≥56	0.317	0.84	0.996
36–45	46–55	0.302	0.87	0.997
	≥56	0.64	0.89	0.952
46–55	≥56	0.34	0.94	0.996

*Tukey HSD test

Discussion

The present study aimed to assess preoperative and postoperative anxiety levels among patient attending for endodontic treatment in department of dentistry at Pokhara academy of health sciences. A reliable and valid Nepali version of MDAS were used as an assessment tool in the present study to assess dental anxiety.

A total of 112 study population undergoing endodontic treatment with mean age of 35.17±16.79 years (minimum age = 18 years, maximum age = 70 years) were included in the study. The largest proportion of participants belonged to the ≤25 years age group (43, 38.4%). MDAS of same patients before and after treatment were compared. When the MDAS scores were compared before and after treatment, patients showed higher anxiety score before undergoing endodontic therapy. Previous studies had suggested that endodontic procedures have been associated with increased anxiety than restorative or prophylactic treatments. Anxiety related to endodontic therapy can also arise when a patient hears a negative experience of another person who underwent a similar dental procedure. The mean dental anxiety score before root canal treatment was 10.13 ± 2.95, which significantly reduced to 8.28 ± 2.53 after treatment. The MDAS scores significantly decreased from pre-ET to post-ET ($p < 0.001$). The results of this study are in agreement with another study conducted by Riyadh et al.⁷ Reduction in mean dental anxiety score after ET may be due to the decreasing pain after initiating root canal treatment. The Present study showed the association between Anxiety and pain.⁸ Another possible reason for the reduction in anxiety

during subsequent visits is that, after the first treatment session, patients may realize that the procedure is less painful than they had initially expected, leading to less anxious during subsequent visits. Study shows that good communication with the patient can also reduce patient anxiety.⁹ Study also shows that longer patients wait in the reception area before treatment, the more anxiety they report.¹⁰

In the present study, female patients demonstrated significantly higher dental anxiety scores than males both before treatment ($p < 0.001$) and after treatment ($p = 0.020$). The result in the present study is consistent with the findings of previous studies.^{7,11} in which female patients reported higher anxiety compared to male patients. However, this was in contrast to a study conducted by Varada et al which revealed no significant differences in anxiety reduction across gender.¹² Differences in anxiety levels between sexes in the present study may be attributed biological factors, psychosocial factors and heightened pain sensitivity.¹³

No significant difference was found in pre-treatment dental anxiety scores across different age groups ($p = 0.103$) in the present study. Patients aged 18–25 years exhibit highest anxiety levels than those in other age groups. These findings are concordant with those of previous studies investigating anxiety levels.¹⁴ However, post-treatment anxiety scores differed significantly among age groups ($p = 0.019$) suggesting that age may be a contributing factor in post- endodontic anxiety expression.

There are several limitations in the present study. Data were collected from single center which can lead to limited generalizability, potential bias and lack of heterogeneity. Multicenter studies are suggested to be conducted for generating high impact and reliable evidence. Anxiety scores are based on self reported measures which were subjected to response bias or recall bias.

Conclusions

The mean dental anxiety score was significantly reduced after endodontic treatment. Educating patients on modern endodontic techniques can serve as an effective strategy for reducing pre-treatment anxiety. This Study emphasizes that addressing dental anxiety through both awareness and intervention helps to improve patient outcomes and overall satisfaction with dental procedures Future research is needed to further explore the management of dental anxiety in endodontics.

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