

# Determinants of Stress in Patients Requiring Endodontics Therapy in the City of Qazvin in 2022

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**Objectives** Dental stress and anxiety are often considered as important factors in patients' avoidance of dental visits. The etiology of dental stress and anxiety appears to involve a combination of behavioral, genetic, and human factors, which are still poorly understood. This study aimed to explore the causes of dental stress in endodontics.

**Methods** Data collection was performed using a standard questionnaire. The first part of the questionnaire was related to demographic characteristics, including age, sex, educational level, and occupation. The second part was the DASS (Depression-Anxiety-Stress Scale) Questionnaire. Statistical analysis was performed using the T-test and ANOVA.

**Results** In this study, 258 patients completed the questionnaires (129 Males, 129 Females). The results showed that women had higher stress scores compared to men, indicating a marginally significant difference ( $p=0.054$ ). There was a lower mean stress score in patients with a previous history of dental visits or endodontic treatment than the first timers ( $p=0.003$ , and  $p=0.002$ , respectively). The correlation coefficient of the relationship between age and DASS score was  $-0.68$ , indicating a significant correlation ( $P=0.03$ ).

**Conclusion** Age, gender, and previous dental experience can affect the level of stress during endodontic treatment.

**Keywords** Stress; Anxiety; Dentistry; Endodontics.

## Introduction

Stress comes from the Latin word "stricus," which means strictness and intensity. One of the most famous researchers on stress was Dr. Seal, who defined it as the normal response of body to all the demands made on it or adaptation to very inappropriate expectations. Anxiety is a direct result of a stressful event, and it is assumed that any situation that endangers the peace of an organism is the cause of anxiety. Anxiety is generally an unpleasant emotion expressed by terms such as worry and fear.<sup>1,2</sup>

Dental stress and anxiety are often considered as important factors in patients' avoidance of dental visits. It is obvious that avoiding the attendance or delaying the visits leads to increased health problems and compromised oral health status.<sup>3</sup>

Anxiety caused by dental treatment is a common disorder that affects the patient's cooperation with the dentist. Anxious patients may overestimate pain and need more time to reduce stress. Anxiety is a well-known phenomenon in dentistry, referred to as treatment fear in many studies. It seems that controlling the patients' stress and anxiety improves their dental experience.<sup>4</sup>

The etiology of dental stress and anxiety appears to be a combination of behavioral, genetic, and human factors, which are still poorly understood. Previous studies have reported that the prevalence of dental stress varies across cultures. In addition, stress depends on many factors, including ethnicity, gender, and the person's economic, social, and literacy status. If the dentist understands the source of patient's stress and anxiety, he or she can better control the patient. Several studies have shown high patient

stress levels in the field of endodontics.<sup>5</sup> One reason for this finding is former dental patients recounting their experiences, including injection pain, post-treatment pain, or pain between sessions, which may affect their stress level.<sup>6</sup> Some studies have even found that dentists and dental students might experience stress during treatment due to the complexities of this field, which may be transmitted to their patients.<sup>7</sup>

The results of a survey in the field of Endodontics showed that the general perception of endodontic treatment is usually negative, mostly due to the reports of pain associated with this treatment.<sup>8</sup> In a study, Wali et al. reported that 13% of their 200 patients did not attend the treatment sessions because of fear of pain.<sup>9</sup>

Studies have shown that women have higher levels of dental fear and anxiety, and mothers, as a subset of women who receive dental services, may delay their children's dental visits due to their fears.<sup>10,11</sup> This can cause serious problems since dental visits are necessary to maintain and improve children's oral and dental health.

Dental treatments can also have financial consequences; Therefore, any delay in receiving basic dental services or, in some cases, a general refusal to receive them due to the stress of presence in medical centers can lead to multiple problems in public health status.<sup>12</sup>

Therefore, one of the important factors in receiving dental services is the mental preparation of the individual and society to reduce stress and anxiety caused by the dental environment. A study of 200 mothers and children in India collected demographic factors, information related to the Children's Fear Scale, and dmft index. The results showed higher dental caries levels in children with higher maternal

anxiety levels. Some studies showed that anxiety could reduce the individual's oral health level and society.<sup>13,14</sup>

Stress can be effectively controlled by creating a suitable learning environment or raising the individual's level of awareness, controlling unknown factors that can affect stress, counseling, establishing proper communication with others, and medication or therapy.<sup>15</sup>

The complications of endodontic treatment and different treatment aspects can sometimes lead to reactions from the patient that exaggerate the expression of pain and fear, which can also affect the dentist's performance.<sup>16</sup>

Due to the nature of endodontic treatment, most patients experience pain during or after the treatment session. According to several studies, endodontic treatment is stressful for most patients. Knowledge of the factors that cause stress and anxiety for patients undergoing endodontic treatment helps to manage and overcome stress, provides peace of mind, and improves the quality of treatment. Considering the lack of comprehensive studies in this regard in Iran, and due to the importance of knowing the determinants, as well as the important role of stress and anxiety in the endodontic treatment's process, the present study aimed to explore the causes of dental stress in the city of Qazvin in 2022.

## Methods and Materials

After receiving ethical clearance from the Ethics Committee of Qazvin University of Medical Sciences (ir-Qums.1400.264), the researchers visited the Endodontics Department of Qazvin School of Dentistry and invited volunteers to participate in the study. First, one of the professors in the Endodontics Department confirmed the patients' need for endodontic treatment. Then, the patients were invited to participate in the study, and the questionnaire was given to them. The researcher answered any questions the patients had regarding completing the questionnaire. If the questionnaire was not completed fully, the researcher asked the patient to complete it again. The researcher distributed the questionnaire, and the endodontic treatment was performed for every participant by an undergraduate dentistry student or postgraduate endodontics student under the supervision of an endodontics professor.

The inclusion criteria were Iranian nationality, being a native resident of Qazvin, age above 18 years, confirmed need for endodontic treatment, lack of mental illness, not using psychiatric drugs according to the patient's self-reports, and consent to participate in the study. The incompleteness of the questionnaire and refusal to continue participating in the study were considered as exclusion criteria.

The DASS (Depression-Anxiety-Stress Scale), a 21-item questionnaire developed and validated by Lovibond in

1995, was used for data collection. This questionnaire has been translated and validated in Persian and used in several studies. According to the DASS, the patient's stress and anxiety are classified as normal, mild, moderate, intense, and very intense. The answer options are scored on a 5-point Likert scale from 0 to 4. The total score of the questionnaire ranges from 0 to 84. The first part of the questionnaire is related to demographic characteristics, including age, sex, education level, and occupation. The patients were asked about their history of dental visits and categorized into two groups: patients with a previous history and first-timers. Immediately after completing the questionnaire, the researcher checked it for the accuracy of the answers, and if there were any ambiguities, the patient was asked to correct them. All participants had panoramic radiographs through which the researcher could easily discover a previous history of endodontic therapy. After careful evaluation and ensuring their completeness, the questionnaires were analyzed using SPSS software version 24. One-way analysis of variance (ANOVA), t-test, and Pearson's correlation coefficient were used for data analysis. One-way ANOVA was used to compare the means of more than three groups of variables (job, level of education, age group, marital status). The t-test was used to compare means according to gender, dental visit experience, and endodontic experience. Pearson's correlation was used to measure the linear correlation between age and anxiety score.

## Results

In this study, 258 patients completed the questionnaires, of whom 129 were men and 129 were women. According to the results, the highest frequency of age was seen in the 21-30-year-old group (n=93), followed by the 31-40-year-old group (n=57) and the 41-50-year-old group (n=49). The mean age of the patients was 32 years old. Regarding the educational level, below high school education and high school diploma had the highest frequency, while doctorate degree had the lowest frequency (n=30). A number of 207 participants had a positive history of dental treatment, and 51 were first timers. Moreover, 145 participants had a history of root canal treatment, and 113 attended the dental school clinic for root canal treatment for the first time (Table 1).

Table 2 shows the statistical analysis results based on the participants' gender, previous dental history, previous endodontics treatment, and level of education. According to the results of t-test, women had higher stress scores (48.37) compared to men (43.24), indicating a marginally significant difference (p=0.054). The patients with a history of endodontic treatment had significantly lower scores than those with a negative history (p=0.002). Also, t-test results showed a significantly lower mean score of stress and

anxiety in patients with a previous history of dental visits compared to first timers ( $p=0.003$ ). According to the ANOVA test results, the highest stress score (47.6) and the lowest stress score (41.9) were seen in patients with a bachelor's degree and those with postgraduate education and doctorate degrees, respectively. However, the difference was not statistically significant ( $p= 0.097$ ).

According to the result of this study, the correlation coefficient of the relationship between age and DASS score was  $-0.68$ , indicating a negative significant correlation. In addition, a comparison of this value in the tables of correlation coefficients suggested that this correlation was very strong, and the stress level decreased with age.

**Table 1-** Demographic Characteristics of participants (N=258)

Variable	Category	Number	Percentage (%)
Gender	Male	129	50
	Female	129	50
Age range	18-21	42	16/27
	21-30	93	36/04
	31-40	57	22/09
	41-50	49	18/99
	+51	17	6/58
Maternal status	Single	141	54/65
	Married	90	34/88
	Others	27	10/46
Level of education	Under diploma and diploma	135	52/32
	Associate degree and bachelor	93	36/04
	Master and doctorate	30	11/62
Dental visit experience	Yes	207	80/23
	No	51	19/76
Endodontics therapy experience	Yes	145	56/2
	No	113	43/79

**Table 2-** Stress score according to Gender, previous dental treatment, previous endodontics treatment, and education (N=258)

	Category	Number	Mean stress score ( $\pm$ SD)	P value	Statistical test
Gender	Male	129	43/24( $\pm$ 6.73)	0.054	T-test
	Female	129	48/37( $\pm$ 7.97)		
previous dental treatment experience	Yes	207	34.8( $\pm$ 4.1)	0.003	T-test
	NO	51	46.6( $\pm$ 7.9)		
Previous endodontics treatment experience	Yes	145	31.8( $\pm$ 4.05)	0.002	T-test
	No	113	49.8( $\pm$ 8.2)		
Education	-Diploma and lower	135	46/5( $\pm$ 9/1)	0.097	Anova
	-Associated and bachelor	93	44/7( $\pm$ 4/7)		
	-Master and doctorate	30	47/6( $\pm$ 3/8)		

## Discussion

This study aimed to investigate the factors affecting the stress and anxiety of patients requiring endodontic treatment at Qazvin Dental School in 2022. This descriptive analytical study involved a questionnaire completed by 258 referrals to Qazvin Dental Faculty. Data were collected using the standard DASS questionnaire, widely used in international psychological studies. According to the results, gender may serve as a determinant

of stress. The mean stress score was significantly higher in women than in men, in line with findings from studies by Riyadh Alroomy et al.,<sup>4</sup> Schwartz et al.,<sup>17</sup> and Thamson et al.,<sup>18</sup> which reported higher mean stress scores in women compared to men. This difference could be attributed to the emotional nature of women, who tend to experience higher stress levels.<sup>19</sup>

Regarding the relationship between the history of dental treatment and stress scores, the results showed a significantly lower stress score in the group with a positive

treatment history compared to the group with a negative history. This finding suggests that previous dental treatment experiences can reduce stress, possibly due to increased self-confidence and trust in dental procedures.<sup>20</sup> Similar findings were reported in a study by Monteiro Grisolia et al.,<sup>21</sup> indicating that a positive history of dental visits reduced fear.

Concerning the history of endodontic treatment, participants with a positive history had significantly lower mean stress scores than those with a negative history, supporting the idea that a positive history of endodontic treatment can boost self-confidence and trust. This result aligns with a study by Thamson et al.,<sup>18</sup> which found that a positive history of dental treatment, including endodontics, reduced stress.

There was no significant association between the educational level and stress score. While the highest stress score was observed in patients with a bachelor's degree and the lowest in those with a master's or doctorate degree, the difference was not statistically significant. This result may be attributed to various factors influencing the stress other than educational level. People with higher educational levels are often older, and socioeconomic factors and issues like unemployment can affect stress levels, particularly in developing countries like Iran.<sup>22</sup>

The study also found a negative significant correlation (-0.68) between the age and anxiety scores, indicating that stress levels decrease with age. This may be because older individuals tend to have more dental experience and enhanced coping skills to handle life's challenges. Similar results were reported by Elizabeth Carter et al. in a study that found lower stress levels in age groups above 40-65 years compared to the 20-39-year age group.<sup>20</sup>

The results of a study by Elizabeth Carter et al.,<sup>23</sup> that compared Australian and Saudi Arabian populations showed that racial, ethnic, and cultural differences changed the overall stress level. In order to control this variable in the present study, permanent residence in Qazvin was

considered as an inclusion criteria in order to increase cultural homogeneity among the participants. In addition, the patients aged below 18 years were excluded; therefore, age was also controlled to some extent. Obviously, due to the different mental and psychological structure of children and adolescents compared to adults, it was not possible to have clear results if these age groups were not separated.

The findings of the present study suggested that dental fear is a general phenomenon embedded in human psychology with a significant influence on procedures such as endodontic treatment that cause more stress.

The strength of the present study was that it included more variables compared to other similar studies. Another advantage was its conduction in an academic center (Qazvin University of Medical Sciences), in which the participants were economically homogeneous to a large extent. The study also had some limitations, including the impact of the COVID-19 pandemic, which reduced the available sample size. Future studies should explore younger age groups and patients visiting different private and public dental centers to assess the influence of economic differences on various parameters. Additionally, conducting studies in other dental school departments, such as surgery, orthodontics, and cosmetic dentistry, would allow for investigating stress score differences among different dental conditions.

## Conclusion

In conclusion, this study highlighted that age, gender, and previous dental experiences can influence patients' stress levels when receiving dental services. Previous endodontic treatment experience plays a significant role in reducing stress during root canal treatment.

## Conflict of Interest

No Conflict of Interest Declared ■

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