Published by
Saidu Medical College

OPEN ACCESS

Original Article

Factors Influencing Dental Anxiety in Adults Presenting to the Outpatient Department of Saidu College of Dentistry, Swat

Fayyaz Alam[1], Aqsa Afzal[1], Muhammad Zohaib[1], Faryal Ayoub[1], Shafqat Ali Shah[2], Warisha Ubaid[1], Faiz-ur-Rahman[1] & Safia Ali[1]

[1]Saidu College of Dentistry, Swat, Pakistan
[2]Khyber College of Dentistry, Peshawar, Pakistan

https://doi.org/10.52206/jsmc.2025.15.4.1138

Abstract

Background: Dental anxiety is a widespread concern that negatively impacts oral health and quality of life. Patients experiencing dental anxiety often delay or avoid treatment, which can lead to worsening oral conditions and compromised general well-being.

Objective: This study aimed to identify the prevalence and key factors associated with dental anxiety among adults attending the outpatient department of Saidu College of Dentistry, Swat.

Methodology: A descriptive cross-sectional study was conducted from December 2023 to May 2024. A total of 384 adults aged 18–65 years were recruited through consecutive non-probability sampling. Data were collected using a structured, validated questionnaire with a Cronbach's alpha of 0.89. The tool assessed demographics, nervousness regarding dental visits, anxiety linked to dental instruments and drill sounds, past experiences, social influences, and concerns about pain, outcomes, and costs. Descriptive statistics were calculated, and associations between gender and anxiety-related factors were analyzed using chi-square or Fisher's exact test, with $p \leq 0.05$ considered significant.

Results: Of the 384 participants, 52.9% were females and 47.1% males. The largest age group was 18–30 years (40%). Fear of dental pain (69%) and nervousness about dental visits (64%) were the most frequently reported sources of anxiety. Delay in dental visits due to anxiety was reported by 60% of participants, while 58% identified drill sounds and 57% identified dental instruments as triggers. Gender differences were significant, with males more likely to report nervousness about visiting the dentist, whereas females showed higher anxiety regarding instruments, drill sounds, and delayed treatment ($p < 0.001$).

Conclusion: Dental anxiety was highly prevalent, primarily driven by fear of pain, nervousness about visits, and sensory stimuli such as instruments and drill sounds. Gender-based differences highlighted the need for tailored interventions, with strategies focusing on reducing sensory triggers for females and addressing nervous anticipation in males.

Keywords: Dental anxiety, Dental fear, Gender differences, Nervousness, Sensory triggers.

ISSN (P): 1819-4583
ISSN (E): 3007-9470

Copyright © Copyright (c) 2025 The authors retain the copyrights. Authors are permitted and encouraged to post their work online (e.g. in institutional repositories or on their website), as it can lead to productive exchanges, as well as greater citation of published work.

Citation:
Alam F, Afzal A, Zohaib M, Ayoub F, Shah SA, Ubaid W, et al. Factors influencing dental anxiety in adults presenting to the outpatient department of Saidu College of Dentistry, Swat. J Saidu Med Coll. 2025;15(4)579–585.

Corresponding Author:
Dr. Aqsa Afzal
Post Graduate Resident,
Saidu College of Dentistry, Swat
aqsaafzal334488@gmail.com

Funding:
The authors received no external funding for this study.

Conflicts of Interests:
The authors have declared that no competing interests exist.

Data Sharing Statement:
The data that support the findings of this study are available on request from the corresponding author. The data is not publicly available due to privacy or ethical restrictions.

Received: October 31, 2024
1st Revision: July 13, 2025
2nd Revision: September 04, 2025
Accepted: September 20, 2025

Check for updates

Introduction

Dental anxiety is a serious and prevalent issue that affects populations worldwide, irrespective of geography or culture [1]. It is characterized as a subjective feeling of unease or dread related to dental treatment, often associated with internal perceptions of danger rather than actual external threats [2]. This condition not only undermines patients' willingness to seek timely dental care but also negatively influences oral health outcomes and quality of life [3].

Multiple factors contribute to the development of dental anxiety, ranging from traumatic dental experiences, loss of control in the dental chair, and mistrust of dental professionals, to socially transmitted fears and shame-related responses [4–5]. While anxiety may sometimes permit basic procedures such as restorations, heightened levels of fear can significantly impair treatment compliance and patient cooperation [6].

Sociodemographic factors also influence the prevalence and intensity of dental anxiety. Studies consistently show that younger individuals are more likely to experience dental fear compared to older adults, and women generally report higher levels of anxiety than men [7–8]. This gender variation may be due to differing pain thresholds, communication styles, and sociocultural norms around the expression of fear [8].

Avoidance behaviors linked to dental anxiety lead to irregular attendance and reliance on emergency care, which further worsens oral health [9]. Key triggers include fear of pain, injection needles, treatment failure, financial concerns, and the risk of infection during procedures [8,10]. Additionally, individuals with lower socioeconomic status often report greater anxiety, reflecting the psychosocial dimension of dental fear [10].

Previous studies have reported varying prevalence rates of dental anxiety. For example, one study found a prevalence of 29.2%, with moderate, high, and extreme levels of anxiety reported in 15.9%, 9.3%, and 3.7% of participants, respectively [2]. Given the complex interplay of psychological, social, and economic factors, identifying the specific contributors to dental anxiety is essential for improving patient management.

The present study was therefore designed to assess the prevalence and factors associated with dental anxiety among adults attending the outpatient department of Saidu College of Dentistry, Swat. By identifying these factors, dental professionals can develop targeted approaches to reduce anxiety, foster trust, and enhance the dental care experience for patients.

Methodology

Study Design:

This was a descriptive cross-sectional study designed to investigate the factors influencing dental anxiety among adult patients attending the outpatient department (OPD) of Saidu College of Dentistry, Swat. The cross-sectional nature of the study allowed for the assessment of prevalence and associated factors of dental anxiety within a defined population at a specific point in time.

Ethics:

The study was conducted following approval from the institutional ethical review board (Ref. no: 16ERB/024). Written informed consent was obtained from all participants prior to enrollment, ensuring confidentiality and voluntary participation. Ethical principles of autonomy, beneficence, and justice were strictly observed throughout the study.

Setting:

Data collection took place at the OPD of Saidu College of Dentistry, Swat, Pakistan, over a five-month period from December 25, 2023, to May 25, 2024. The setting provided a diverse patient population, allowing for recruitment across a wide age and socioeconomic spectrum.

Participants:

A total of 384 adult patients aged between 18 and 65 years were recruited using a consecutive non-probability sampling method. Both male and female Pakistani nationals presenting to the OPD during the study period were considered eligible. Inclusion criteria required participants to be healthy and capable of giving informed consent, while exclusion criteria included refusal to participate, ongoing psychiatric therapy, generalized anxiety disorder, and significant comorbid conditions such as diabetes, cardiovascular disease, or respiratory depression.

Variables:

The primary outcome variable was dental anxiety, which was assessed in terms of fear of dental pain, nervousness about visits, anxiety due to dental instruments or drill sounds, and avoidance or delay of dental appointments. Independent variables included demographic characteristics (age, gender, education) and psychosocial contributors such as past dental experiences, stories from others, concerns about treatment outcomes, and financial considerations.

Data Sources/Measurement:
Data were collected using a structured, validated questionnaire adapted from prior literature. The tool was divided into two sections: demographics (age, gender, education) and anxiety-related factors. Responses were measured using a five-point Likert scale (strongly agree to strongly disagree). A pilot test on 10 patients confirmed validity and internal consistency, with Cronbach's alpha of 0.89. The questionnaires were administered in the OPD waiting area, and completed forms were securely stored.

Bias:
To minimize selection bias, consecutive sampling was employed to include all eligible patients during the study period. Information bias was reduced by using a validated questionnaire and providing clear instructions to participants. Social desirability bias was minimized by assuring participants of confidentiality and encouraging honest responses.

Study Size:
The sample size of 384 was determined using OpenEpi software, assuming a 50% expected prevalence of dental anxiety (based on clinical experience), 5% margin of error, and 95% confidence interval. This ensured adequate statistical power to detect significant associations.

Quantitative Variables:
Quantitative variables included age (categorized into four groups: 18–30, 31–45, 46–60, and 61–65 years) and education level (primary, secondary, post-graduation). Categorical variables, such as gender and responses on the Likert scale, were analyzed as proportions.

Statistical Methods:
Data analysis was performed using IBM SPSS Statistics version 21. Descriptive statistics were used to summarize the demographic and baseline data. Repeated measures were compared using Analysis of Variance (ANOVA) to detect changes over time. For pairwise comparisons, Student's t-tests were applied. Pearson's correlation was used to assess associations between physiological and hematological parameters. A p-value of less than 0.05 was considered statistically significant.

Results

Participants
A total of 384 adults participated in the study, comprising 181 males (47.1%) and 203 females (52.9%). The age distribution showed that the largest proportion belonged to the 18–30 years age group (n=154, 40%), followed by 31–45 years (n=115, 30%), 46–60 years (n=77, 20%), and 61–65 years (n=38, 10%). In terms of educational attainment, 112 participants (29.2%) reported primary education, 146 (38.0%) had completed secondary education, and 128 (33.3%) were postgraduates. This profile indicated that the sample included a wide demographic spectrum, reflecting patients from varying backgrounds who attended the outpatient department.

Descriptive Data
Overall, participants reported varying levels of dental anxiety across multiple dimensions. Fear of dental pain emerged as a key concern, with 265 (69%) of participants either strongly agreeing or agreeing that it contributed to their anxiety. Similarly, nervousness about visiting the dentist was prominent, with 246 (64%) participants acknowledging it. Delays in dental visits due to anxiety were reported by 231 (60%) participants, suggesting a behavioral impact of anxiety on care-seeking patterns. Anxiety related to dental instruments was observed in 219 (57%), while drill sounds triggered anxiety in 223 (58%). Past dental experiences also played a role, as 238 (62%) agreed or strongly agreed that prior encounters influenced their current level of anxiety. Social influences were evident as well, with 189 (49%) reporting that stories from friends or family contributed to their dental fear. Financial and treatment concerns were also prevalent, with 235 (61%) worried about treatment costs and 212 (55%) expressing concern about treatment outcomes.

Outcome Data
Gender-wise comparisons revealed distinct patterns in anxiety-related responses. Males tended to report higher nervousness about visiting the dentist, with 39.8% agreeing and 32.6% strongly agreeing, compared to females who more often reported neutral responses (35%). In contrast, females exhibited greater anxiety in relation to dental instruments and drill sounds, with 34.5% agreeing and 29.6% strongly agreeing to being anxious about drill sounds, while males were more likely to disagree with these items. Delays in dental visits due to anxiety were significantly more common among females (68% agreed), whereas males more frequently disagreed (23.2%). Interestingly, both genders reported similar levels of fear regarding dental pain, though females leaned towards expressing higher concern over costs and outcomes.

Main Results
The analysis demonstrated that fear of dental pain, nervousness about dental visits, and sensory triggers such as instruments and drill sounds were the predominant factors influencing dental anxiety. Gender differences were

statistically significant across most domains ($p<0.001$), except for anxiety influenced by stories from friends or family, where significance was lower but still notable ($p=0.002$). These results underscore the multifaceted nature of dental anxiety, shaped not only by personal experiences and perceptions but also by demographic and gender-related differences. The findings highlight that while males were more prone to nervousness about attending dental visits, females were more affected by sensory stimuli and were more likely to delay treatment, reflecting both psychological and behavioral consequences of anxiety.

Table 1: Demographic distribution of Participants(n=384)

Characteristics	N (%)
Gender	
Male	181(47.13)
Female	203(52.87)
Age Group(years)	
18-30	154(40)
31-45	115(30)
46-60	77(20)
61-65	38(10)
Educational status	
Primary	112 (29.2)
Secondary	146 (38.0)
Post-graduation	128 (33.3)

Table 2.Distribution of factors for anxiety among participants(n=384)

Characters	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
Nervous about visiting the dentist	127(33)	119 (31)	81(21)	35 (9)	23 (6)
Do you delayed visit due to anxiety	104(27)	127 (33)	85(22)	42 (11)	26 (7)
Dental instruments increase anxiety	92(24)	127 (33)	88(23)	61 (16)	15 (4)
Drill sounds make me anxious	119 (31)	104(27)	92(24)	50 (13)	19 (5)
Past dental experiences	123 (32)	115 (30)	77(20)	46 (12)	23 (6)
Stories from friends/family	85(22)	104 (27)	100(26)	69 (18)	27 (7)
Fear of dental pain	123(32)	142 (37)	54(14)	42 (11)	23 (6)

Table 3. Comparison of distribution of factors for anxiety among participants among gender (n=384)

Characteristic	**Male**, N = 181	**Female**, N = 203	**p-value**
Nervous about visiting the dentist			<0.001
Strongly agree	59(32.6)	65(32.0)	
Agree	72(39.8)	47(23.2)	
Neutral	10(5.5)	71(35.0)	
Disagree	35(19.3)	0(0.0)	
Strongly disagree	5(2.8)	20(9.9)	
Do you delayed visit due to anxiety			<0.001
Strongly agree	59(32.6)	45(22.2)	
Agree	74(40.9)	138(68.0)	
Neutral	0(0.0)	0(0.0)	
Disagree	42(23.2)	0(0.0)	
Strongly disagree	6(3.3)	20(9.9)	
Dental instruments increase anxiety			<0.001
Strongly agree	51(28.2)	41(20.2)	
Agree	57(31.5)	70(34.5)	
Neutral	23(12.7)	65(32.0)	
Disagree	50(27.6)	11(5.4)	
Strongly disagree	0(0.0)	16(7.9)	
Drill sounds make me anxious			<0.001
Strongly agree	59(32.6)	60(29.6)	
Agree	53(29.3)	51(25.1)	
Neutral	20(11.1)	72(35.4)	
Disagree	49(27.1)	1(0.5)	
Strongly disagree	0(0.0)	19(9.4)	
Past dental experiences			<0.001
Strongly agree	59(32.6)	64(31.5)	
Agree	68(37.5)	47(23.2)	
Neutral	5(2.8)	72(35.4)	
Disagree	46(25.4)	0(0.0)	
Strongly disagree	3(1.7)	20(9.9)	
Stories from friends/family			0.002
Strongly agree	44(24.3)	41(20.2)	
Agree	42(23.2)	62(30.5)	
Neutral	45(24.9)	55(27.1)	
Disagree	44(24.3)	25(12.3)	
Strongly disagree	6(3.3)	20(9.9)	
Fear of dental pain			<0.001
Strongly agree	59(32.6)	64(31.5)	
Agree	72(39.8)	70(34.5)	
Neutral	5(2.8)	49(24.1)	
Disagree	42(23.2)	0(0.0)	
Strongly disagree	3(1.7)	20(9.9)	
Concern about treatment outcomes			<0.001
Strongly agree	59(32.6)	45(22.2)	

Agree	42(23.2)	66(32.5)	
Neutral	30(16.6)	66(32.5)	
Disagree	44(24.3)	6(3.0)	
Strongly disagree	6(3.3)	20(9.9)	
Concern about the cost of treatment			<0.001
Strongly agree	59(32.6)	53(26.1)	
Agree	65(35.9)	58(28.6)	
Neutral	7(3.9)	66(32.5)	
Disagree	40(22.1)	6(3.0)	
Strongly disagree	10(5.5)	20(9.9)	

Discussion

The findings of this study provide critical insights into the factors contributing to dental anxiety among adults attending dental OPDs. The demographic data revealed a nearly balanced gender distribution and wide age representation, confirming that dental anxiety is not confined to a specific subgroup but rather spans across populations.

A significant proportion of participants reported delaying or avoiding dental visits due to anxiety, which supports earlier evidence linking dental fear with irregular dental attendance and reactive care-seeking behaviors [11]. This avoidance pattern reinforces the cycle of dental fear, where delayed treatment leads to worsening oral health, further reinforcing the fear of dental procedures.

Fear of pain, nervousness about dental visits, and sensory triggers such as dental instruments and drill sounds were the most prominent factors identified. These findings corroborate previous studies that emphasize pain anticipation and auditory stimuli as major contributors to dental anxiety [8,12–13]. Similarly, the role of negative past dental experiences and socially transmitted fear through stories from family and friends further strengthens the concept that both personal and vicarious experiences significantly influence anxiety levels [14–15].

Gender-based differences were particularly notable. Males were more likely to report nervousness about visiting the dentist, whereas females showed higher levels of anxiety associated with instruments, drill sounds, and delays in treatment. These results are consistent with previous literature reporting higher levels of self-reported dental fear in women, often attributed to lower pain thresholds and greater willingness to verbalize discomfort, compared to men who tend to suppress such expressions [7–8].

The contribution of financial concerns and treatment outcome worries was also evident in the present study. Participants expressed apprehension about costs and fear of unsuccessful treatment outcomes, factors that align with psychosocial causes of dental anxiety described in earlier research [10]. Together, these findings highlight the multifactorial nature of dental anxiety, encompassing psychological, social, gender-related, and economic influences.

Although the study provides meaningful evidence, several limitations should be acknowledged. The cross-sectional design precludes causal inference, and reliance on self-reported measures may have introduced response bias. Furthermore, as a single-center study, the results may not be fully generalizable to other populations or regions. Despite these limitations, the study contributes valuable data for understanding the patterns and determinants of dental anxiety in a local Pakistani context.

Conclusion

This study confirmed that dental anxiety is highly prevalent among adults attending dental OPDs, with the main factors being fear of pain, nervousness about dental visits, and sensory stimuli such as dental instruments and drill sounds. Gender differences were evident, with men showing more nervous anticipation and women demonstrating stronger anxiety toward instruments, drill sounds, and treatment delays. Additionally, past dental experiences, social influences, treatment outcome concerns, and financial burdens played significant roles in shaping dental anxiety.

Addressing these factors requires a holistic, patient-centered approach that includes effective communication, reassurance, behavioral management strategies, and cost-sensitive interventions. By adopting tailored and gender-sensitive approaches, dental practitioners can mitigate

anxiety, improve patient cooperation, and enhance the overall quality of care.

Authors' Contributions:

All authors meet the ICMJE criteria for authorship. They have reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Author 1: Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 2: Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 3: Analysis and interpretation of data, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 4: Analysis and interpretation of data, critical revision, final approval, agreed to be accountable for all the work.
Author 5&6: Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Author 7&8: Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work

References

1. Alowid AM, Hebbal M, Aldegheishem A, Nadakkavukaran Santhosh V, Surath Kumar R, Alfayyadh AM, et al. A cross-sectional study on levels of dental anxiety, its influencing factors, and the preferred management techniques among patients in Riyadh, Saudi Arabia. *PLoS One.* 2024 Sep 6;19(9):e0309248. https://doi.org/10.1371/journal.pone.0309248.
2. Arif K, Alam B, Khan MI, Khare A, Malhotra S, Singh B. To assess the prevalence of dental anxiety among patients visiting a teaching dental hospital in Lucknow, India, and their self-perceived treatment needs. *J Oral Biol Craniofac Res.* 2022 Nov 1;12(6):798-801. https://doi.org/10.1016/j.jobcr.2022.09.007
3. Sukumaran I, Taylor S, Thomson WM. The prevalence and impact of dental anxiety among adult New Zealanders. *Int Dent J.* 2021 Apr 1;71(2):122-6. https://doi.org/10.1111/idj.12613
4. Scandurra C, Gasparro R, Dolce P, Bochicchio V, Muzii B, Sammartino G, et al. The role of cognitive and non-cognitive factors in dental anxiety: A mediation model. *Eur J Oral Sci.* 2021 Aug;129(4):e12793. https://doi.org/10.1111/eos.12793
5. Kassem El Hajj H, Fares Y, Abou-Abbas L. Assessment of dental anxiety and dental phobia among adults in Lebanon. *BMC Oral Health.* 2021 Dec;21:1-0. https://doi.org/10.1186/s12903-021-01409-2
6. Muduroglu R, Ionescu AC, Del Fabbro M, Scolavino S, Brambilla E. Distribution of adhesive layer in class II composite resin restorations before/after interproximal matrix application. *J Dent.* 2020 Dec 1;103:103494. https://doi.org/10.1016/j.jdent.2020.103494
7. Ghaffar RS, Sheikh M, Kidwai M, Sanaullah A, Salman M, Ilyas A, et al. Impact of high-speed handpiece noise-induced dental anxiety on heart rate: analyzing experienced and non-experienced patients-a comparative study. *BMC Oral Health.* 2024 Feb 23;24(1):265. https://doi.org/10.1186/s12903-024-04017-y
8. Muneer MU, Ismail F, Munir N, Shakoor A, Das G, Ahmed AR, et al. Dental anxiety and influencing factors in adults. *Healthcare (Basel).* 2022 Nov 23;10(12):2352. https://doi.org/10.3390/healthcare10122352
9. Sinha E, Rekha R, Nagashree SR. Anxiety of dental treatment among patients visiting primary health centers. *J Indian Assoc Public Health Dent.* 2019 Jul 1;17(3):235-45. https://doi.org/10.4103/jiaphd.jiaphd_178_18
10. Sălcudean A, Truşculescu LM, Popovici RA, Şerb N, Paşca C, Bodo CR, et al. Dental anxiety – a psychosocial cause affecting the quality of life: a systematic review. *Rom J Oral Rehabil.* 2024;16(4).31. https://doi.org/10.62610/RJOR.2024.4.16.46
11. Armfield JM, Stewart JF, Spencer AJ. The vicious cycle of dental fear: exploring the interplay between oral health, service utilization, and dental fear. *BMC Oral Health.* 2007 Dec;7:1-5. https://doi.org/10.1186/1472-6831-7-1
12. Karim ZA, Ali MF, Askary G, Askary H, Siddiqui UN. Factors influencing level of anxiety and pain in patients receiving endodontic treatment. *Natl J Health Sci.* 2023 Dec 28;8(4):152-7. https://doi.org/10.21089/njhs.84.0152
13. Dhanapriyanka M, Jayasekara P, Rumy AS, Athambawa N, Haseena AL, Salman KR, et al. Prevalence and associated factors of dental anxiety among adults attending public outpatient dental clinic in the Eastern Province, Sri Lanka. *BMC Oral Health.* 2024 Dec 24;24(1):1549. https://doi.org/10.1186/s12903-024-05288-1
14. Winkler CH, Bjelopavlovic M, Lehmann KM, Petrowski K, Irmscher L, Berth H. Impact of dental anxiety on dental care routine and oral-health-related quality of life in a German adult population: A cross-sectional study. *J Clin Med.* 2023 Aug 14;12(16):5291. https://doi.org/10.3390/jcm12165291.
15. Tahmassebi JF, Malik M, Berg N, Pavitt S, Gray-Burrows K, O'Grady A. Using process drama to explore the causes of dental anxiety in primary-school children. *Eur Arch Paediatr Dent.* 2021 Oct;22(5):869-77. https://doi.org/10.1007/s40368-021-00623-4