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Triggers and Relievers of Dental Anxiety: Comparative Analysis of Patient Perceptions in Private and Public Dental Settings

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ABSTRACT

Background: Dental anxiety is a prevalent issue that affects a significant portion of the population, leading to avoidance of dental care. The study aimed to identify and compare the self-perceived triggering and relieving factors of dental anxiety among patients of private and public dental institutes in Punjab.

Methods: This analytical cross-sectional study was conducted between Dec 2021 and Oct 2022, on a sample of 711 physically and mentally healthy patients reporting to three private and two public dental hospitals in Punjab with a score of 11 and above on MDAS, using consecutive sampling. The former section of the questionnaire included demographics, while the latter part focused on self-reported triggers and relieving factors of dental anxiety. The data was analyzed using SPSS, and compared using the chi-square test. A p-value of ≤0.05 was taken as significant.

Results: The study included 51.3% females (n=365) and 48.7% males (n=346). Dirty instruments were a major trigger (67.1%, n=477, p=0.001), followed by stressful waiting rooms (54.4%, n=387, p=0.007) and complex procedures (49.2%, n=350, p=0.001) in public hospitals. Delayed appointments were a common trigger (41.1%, n=292) in both settings. Reassurance from the dentist (68.5%, n=487, p=0.087) and minimal waiting times (64.8%, n=461, p=0.012) were key relieving factors in both settings.

Conclusion: Dental anxiety triggers were more frequent in public settings, including dirty instruments, stressful waiting room environments, and complex procedures. In contrast, private settings showed fewer triggers. However, both public and private patients valued reassurance from the dentist and minimal waiting times as major relieving factors.

Keywords: Dental Anxiety, Patient Perception, Triggers of anxiety, Waiting Room.

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INTRODUCTION

Anxiety is an abstract, subjective experience with immense diversity in its presentation, making it a challenge to measure. Dental anxiety is a fear of the unknown which results in delay or avoidance of dental treatment[1]. Overall anxiety in the world has been reported to be as high as 80%. Out of which 3-15% of adults experience dental phobia to such an extent that there is complete avoidance of care unless there is an emergency[2].

Previous studies have classified triggers of dental anxiety into four major categories, i.e., visual (looking at the equipment, blood etc.), auditory (hearing the drills and instruments), sensory-motor (sensing the vibrations from drills and other dental equipment) and olfactory (smell of dental related materials). Moreover, considering both exogenous factors, such as environmental triggers, and endogenous factors, such as personal stress levels, can significantly improve the dental treatment experience and encourage better adherence in patients with dental anxiety[3]. Studies have reported that out of hundred, every eight people suffer from dental phobia through exogenous stimuli, and a significant proportion of them acquire it through past traumatic experiences, especially during childhood[4].

Exogenous stimuli, including clinic design, waiting room environment, and procedure room atmosphere, play an important role in triggering dental anxiety and, therefore, must be taken into account as patients' perception of these factors influences their treatment experience[3]. Background music, a calm environment, and a well-decorated clinic with neutral pictures and books reduce patients' anxiety for the dental treatment[5]. Similarly, reduced waiting time and proper patient management by clinical staff in the waiting area have reportedly decreased patients' stress levels. Moreover, decreased sounds/vibrations in the operator room, clean instruments placed away from the patient, and minimal blood and sharp instrument sightings in the clinic have reportedly reduced dental anxiety, especially in phobic patients[6].

In Pakistan, the private sector is well-funded and better developed than the public sector dental institutes. The triggering factors for dental anxiety must be taken into account and addressed to improve patients' compliance and experience[3,7].

The study aims to identify and compare the self-perceived triggering and relieving factors of dental anxiety in private and public dental institutes of Punjab by understanding the unique challenges and effective strategies within each setting. This comparison can add value to the literature by highlighting specific areas where interventions can be tailored to reduce dental anxiety, improve patient experience, and ultimately enhance the quality of care in different healthcare environments.

METHODS

This questionnaire-based analytical cross-sectional study was conducted after the approval granted by the Institutional Review Board (IRB) of the University College of Medicine and Dentistry, from December 2021 to October 2022, (Ref No: UCD/ERCA/21/11gp) and the respective administrations of participating institutes; Data Darbar Hospital, Punjab Dental Hospital, CMH Lahore Medical College, Fatima Memorial Hospital, Lahore Medical and Dental College. The target population were patients who reported to the outpatient department of private and public dental institutes and were present at the time of the survey. The sample size was calculated using a 95% confidence interval, a 5% margin of error, and an expected prevalence of 62.7%, resulting in a minimum required sample size of 360 participants[2]. To enhance precision, validity, and generalizability, the sample size was increased to 711. The participants were recruited using a consecutive sampling technique.

The authors developed the questionnaire after an extensive literature review of anxiety triggers and relieving factors, and performed a detailed pilot study about those factors on fifty subjects. The questionnaire underwent several revisions during pilot testing. The first part consisted of demographics, a modified dental anxiety scale (MDAS) and items about previous bad experiences. The MDAS was used to assess the level of dental anxiety[2]. The participants were categorized into three age groups; young adults (18-35 years), middle age adults (36-55 years) and older adults (56 and above).

Participants who were mentally and physically healthy, agreed to be the part of the study, were aged 18 years or above and scored 11 and above on MDAS (having moderate to severe dental anxiety) were included in the study. Patients with a MDAS score below 11 (mild to no anxiety), age below 18, having cognitive impairments or mental health conditions that could affect their ability to understand and respond to the questionnaire were excluded. Moreover, patients visiting the dental clinic for emergency treatments were excluded to prevent the acute nature of their visit from skewing the results related to dental anxiety triggers and relieving factors.

Two research experts validated the questionnaire which later underwent several revisions. The finalized version was translated to Urdu, back-translated to English by three people fluent in both languages and modified accordingly. The questionnaire was pilot tested on 40 subjects and later a reliability anal-

ysis was performed using Cronbach's alpha, which came out to be 0.787, falling within the acceptable range.

The survey was done by giving in-hand forms to the participants. The consent and confidentiality statement were mentioned in the questionnaire. Moreover, the study objectives were explained, ambiguities were discussed, and the forms were collected immediately after completion.

The data from the hard copy forms was carefully entered into IBM Statistical Package for Social Sciences (SPSS version 20, IBM Corporation, USA, New York, 2011) by trained research assistants. To minimize errors during data entry, a double-entry verification method was employed, where the data were entered twice and cross-checked for discrepancies. Any inconsistencies were resolved through re-examination of the original questionnaires. Once the data entry was completed, the dataset was cleaned to identify and address any missing or outlying values before proceeding with the statistical analysis. Results were amassed using descriptive statistics. Independent sample t test and one way ANOVA was used to compare the mean MDAS scores. The chi-square test was used to compare the percentages of categorical variables, i.e., private and public institutes. A p-value of ≤0.05 was set as the level for statistical significance.

RESULTS

There was a total of 711 participants in this study, and the response rate was 91%. The demographical data along with past traumatic experience and their comparison with MDAS scores is illustrated in Table 1. The difference in MDAS scores between genders was statistically significant (p=0.001), showing that females experience higher dental anxiety. The mean age was 33.48±13.35. The differences in MDAS scores across age groups were statistically significant (p=0.004), indicating that age is a significant factor in dental anxiety levels. Moreover, the multiple comparisons using post hoc Tuckey test revealed there was a significant difference in MDAS scores when young adults were compared with middle age adults (p=0.02) and older aged adults (p=0.044). However, no significant difference was observed when MDAS scores of middle age adults were compared with older adults (p=0.688). 50.6% (n=360) of the respondents were from private, whereas 49.4% (n=351) were from public sector dental institutes. Around one-fourth (n=159, 22.4%) of the respondents had a past traumatic experience with the dentist. The difference in MDAS scores between those with and without past traumatic experiences was statistically significant (p=0.001).

Table 1: The Demographical Data Along with Past Traumatic Experience and their Comparison with MDAS Scores

Variables		n (%)	MDAS	P-Value
Age	Young adults	464(65.2)	13.49±4.68	0.004
	Middle age adults	192(27)	12.65±4.22	
	Older Adults	55(7.7)	11.58±5.08	
Gender	Male	346(48.6)	12.22±4.14	0.001
	Female	365(51.3)	13.97±4.90	
Institute	Private	360(50.6)	12.93±4.35	0.285
	Public	351(49.3)	13.30±4.89	
Past Traumatic Experience	Yes	159(22.3)	14.33±4.69	0.001
	No	552(77.6)	12.77±4.55	

p-values were obtained using independent sample t test and one way ANOVA

The triggering factors were divided into four major categories, i.e., factors related to the waiting room, dental operatory, dental equipment and procedures. The gender-wise comparison of self-perceived triggering factors of dental anxiety is presented in table 1. A significantly higher proportion of females were triggered by the sight (p<0.001) and sound of dental equipment (p<0.001), dental chair (p<0.001), sharp instruments (p<0.001), dentist's attire (p<0.001), smell of the office (p=0.015), dirty instruments (p=0.024) and the complex procedures (p=0.001).

Table 2: Gender-wise Comparison of Self-Perceived Triggering Factors of Dental Anxiety

Triggers of Dental Anxiety	n(%)	Male n(%)	Female n(%)	χ^2	P-Value
Dental office ambiance	89(12.5)	37(10.7%)	52(14.2%)	2.04	0.152
Waiting room environment	387(54.4)	187(54.0%)	200(54.8%)	0.04	0.841
Delay in appointment	292(41.1)	148(42.8%)	144(39.4%)	0.81	0.368
Dentist's attire	85(12)	21(6.1%)	64(17.5%)	22.1	<0.001
The smell of the dental office	168(23.6)	68(19.7%)	100(27.4%)	5.90	0.015
Sound of instruments	168(23.6)	56(16.2%)	112(30.7%)	20.6	<0.001
The vibration of the instruments	156(21.9)	59(17.1%)	97(26.6%)	9.40	0.002
Dental chair	185(26)	61(17.6%)	124(34.0%)	24.6	<0.001
Seeing the dental equipment	231(32.5)	75(21.7%)	156(42.7%)	35.9	<0.001
Seeing the sharp instruments/needle	230(32.3)	86(24.9%)	144(39.5%)	17.2	<0.001
Single-visit procedures (Filling, scaling)	80(11.3)	30(8.7%)	50(13.7%)	4.49	0.034
Multiple visit procedures (Root canal etc.)	168(23.6)	76(22.0%)	92(25.2%)	1.03	0.309
Complex procedures (Implants, wisdom tooth extraction, etc.)	350(49.2)	148(42.8%)	202(55.3%)	11.2	0.001
Dirty instruments	477(67.1)	218(63.0%)	259(71.0%)	5.08	0.024
Cost of treatment	223(31.4)	109(31.5%)	114(31.2%)	0.006	0.938

p-values were obtained using the Chi-square test

The gender-wise comparison of self-perceived relieving factors of dental anxiety is exhibited in Table 3. Both males and females found minimal waiting time, organized appointments, early morning appointments, blood out of sight, reassurance, and a good rapport with the dentist to be relieving, with no significant difference between genders. Moreover, both genders found a pleasant smell, background music, and presence of a television to be relieving, with no significant difference. Having dental equipment out of sight was significantly more relieving for females ($p<0.001$).

Table 3: Gender-Wise Comparison of Self-Perceived Relieving Factors of Dental Anxiety

Relieving Factors of Dental Anxiety	n(%)	Male (%)	Female (%)	χ^2	P-value
Minimal waiting time	461(64.8)	233(67.3%)	228(62.5%)	2.67	0.263
Organized appointments/ no crowding	286(40.2)	133(38.4%)	153(41.9%)	0.89	0.344
Early morning appointment	218(30.7)	110(31.8%)	108(29.6%)	0.40	0.524
The pleasant smell of the dentist's office	231(32.5)	120(34.7%)	111(30.4%)	1.47	0.224
Pleasant background music	100(14.1)	50(14.5%)	50(13.7%)	0.08	0.773
Presence of a television	67(9.4)	36(10.4%)	31(8.5%)	0.76	0.383
Dental equipment out of sight	195(27.4)	69(19.9%)	126(34.5%)	18.9	<0.001
Blood out of sight	292(41.1)	148(42.8%)	144(39.4%)		
Dentist addressing your concerns and reassurance	487(68.5)	230(66.5%)	257(70.4%)	1.27	0.259
Rapport with the dentist	407(57.2)	193(55.8%)	214(58.6%)	0.58	0.443
Sufficient anaesthesia	140(19.7)	58(16.8%)	82(22.5%)	3.65	0.056
Nitrous sedation	115(16.2)	48(13.9%)	67(18.4%)	2.63	0.105

p-values were obtained using Chi-square test

Various triggering factors and their comparison between private and public dental institutes is tabulated in Table 4. The most common triggers of dental anxiety were 'dirty instruments', 'stressful waiting room environment', 'complex procedures' and 'delay in appointment'. Dirty instruments were a more common trigger in public institutes (p = 0.001). The waiting room environment was a more significant trigger in public institutes (p = 0.007). Complex procedures were significantly more anxiety-inducing in public institutes (p < 0.001). However, both sectors showed similar concerns regarding delays in appointment, with no significant difference (p = 0.36) Table 4.

Table 4: Comparison of Self-Perceived Triggering Factors of Dental Anxiety Between Private and Public Sector Denial Institutes

Triggers of Dental Anxiety	n(%)	Private Institutes n(%)	Public Institutes n(%)	χ^2	P-Value
Dental office ambience	89(12.5)	32(8.8)	57(16.2)	8.76	0.003
Waiting room environment	387(54.4)	178(49.4)	209(59.5)	7.30	0.007
Delay in appointment/ Increased waiting time	292(41.1)	144(40.2)	147(41.8)	0.18	0.36
Dentist's attire	85(12)	19(5.2)	66(18.8)	30.88	<0.001
The smell of the dental office	168(23.6)	54(15)	114(32.4)	30.08	<0.001
Sound of instruments	168(23.6)	76(21.1)	92(26.2)	2.56	0.11
The vibration of the instruments	156(21.9)	52(14.4)	104(29.6)	23.9	<0.001
Dental chair	185(26)	67(18.6)	118(33.6)	20.79	<0.001
Seeing the dental equipment	231(32.5)	101(28)	130(37)	6.53	0.011
Seeing the sharp instruments/needle	230(32.3)	93(25.8)	137(39)	14.1	<0.001
Single-visit procedures (Filling, scaling)	80(11.3)	29(8)	51(14.5)	7.46	0.006
Multiple visit procedures (Root canal etc.)	168(23.6)	94(26.1)	74(21)	2.4	0.068
Complex procedures (Implants, wisdom tooth extraction etc.)	350(49.2)	135(37.5)	215(61.2)	40.12	<0.001
Dirty instruments	477(67.1)	220(61.1)	257(73.2)	11.8	0.001
Cost of treatment	223(31.4)	108(30)	115(32.7)	0.63	0.42

p-values were obtained using the Chi-square test

The self-perceived relieving factors of dental and their comparison between private and public sector denial institutes are shown in Table 5. The three major relieving factors reported by the participants were 'reassurance by the dentist during treatment', 'minimal waiting time', and 'good rapport with the dentist'. Reassurance was slightly more valued in public institutes, but the difference was not significant (p = 0.087). Minimal waiting time was a more significant relieving factor in public institutes (p = 0.012). Good rapport with the dentist was significantly more important in public institutes (p < 0.001) Table 5.

Table 5: Comparison of Self-Perceived Relieving Factors of Dental Anxiety Between Private and Public Sector Denial Institutes.

Relieving Factors of Dental Anxiety	(%)	Private Institutes (%)	Public Institutes (%)	χ^2	P-Value
Minimal waiting time	461(64.8)	216(60%)	245(69.8%)	8.82	0.012
Organized appointments/ no crowding	286(40.2)	131(36.3%)	155(44.1%)	4.46	0.035
Early morning appointment	218(30.7)	97(26.9%)	121(34.4%)	4.73	0.03
The pleasant smell of the dentist's office	231(32.5)	115(31.9%)	116(33%)	0.09	0.75
Pleasant background music	100(14.1)	51(14.1%)	49(13.9%)	0.006	0.93
Presence of a television	67(9.4)	31(8.6%)	36(10.2%)	0.56	0.45

Dental equipment out of sight	195(27.4)	72(20%)	123(35%)	20.2	<0.001
Blood out of sight	292(41.1)	116(32.2%)	176(50.1%)	23.5	<0.001
Dentist addressing your concerns and reassurance	487(68.5)	236(65.5%)	251(71.5%)	2.92	0.087
Rapport with the dentist	407(57.2)	181(50.2%)	226(64.3%)	14.4	<0.001
Sufficient anaesthesia	140(19.7)	65(18%)	75(21.3%)	1.23	0.26
Nitrous sedation	115(16.2)	43(11.9%)	72(20.5%)	9.62	0.002

p-values were obtained using Chi-square test

DISCUSSION

Anxiety being a subjective experience, is very difficult to measure. This study was done to identify various triggering and relieving factors of dental anxiety. Exogenous factors of dental anxiety were divided into factors related to waiting room environment and management, factors associated with dental operatory, factors associated with the dentist, the equipment and the dental procedures. These exogenous factors, along with endogenous factors, if managed properly, can reduce dental anxiety and, in turn, improve patient attendance[3,8]. One of the major concerns raised in earlier studies was the possibility that some dentists would use dirty or unsterilized tools, placing patients at risk for infection. For several participants, these worries prevented them from getting dental care[9]. In the present study, fear of unsterilized equipment was the most frequently reported trigger of dental anxiety, especially in public institutes and females. Public institutes in Pakistan are underfunded and overcrowded with poor patient management, which may sometimes result in the failure of sterilization and cross-infection control[7,10].

Waiting room environment and management, including lesser waiting time, have a significant role in reducing dental anxiety. Previous literature has reported that a calm environment with positive dental images, fragrances especially orange and lavender, music, comfortable seating, less crowding and organized appointments were all linked with a reduction of dental anxiety[3,11].In the present study, patients in public sector dental institutes reported higher frequencies of anxiety triggers, such as poor dental office ambiance, waiting room environment, dentist's attire, and visibility of and sharp instruments/equipment. These differences can be attributed to the typically lower resources, less appealing facilities, and potentially less stringent infection control practices in public institutes. Moreover, public sector patients valued minimal waiting time, organized appointments, keeping dental equipment and blood out of sight, more than those in private sector institutes. This indicates that improvements in clinic management and patient-dentist interactions could significantly alleviate dental anxiety in public sector settings. Organized appointments and minimal waiting time were crucial relieving factors for anxiety. Public dental institutes often struggle with efficient clinic management due to higher patient volumes. Implementing more effective appointment systems and reducing wait times can significantly help in managing dental anxiety in public settings. The findings of this study were consistent with the previous literature[3,5,11].

Rapport with the dentist and patient-dentist communication have been reported as key factors in reducing dental anxiety. The National Institute of Health and Care Excellence (NICE) pushed person-centered care, including congenial doctor-patient communication, as a crucial element for patient adherence to regular check-ups[12]. Berggren's vicious cycle of dental anxiety begins with avoidance, neglect leading to damaged oral health, embarrassment and an inferiority complex, causing further dental anxiety and avoidance. This cycle can be broken with a trusting patient-dentist relationship through effective communication[13]. In the present study, around 7 out of 10 people reported that reassurance by the dentist during treatment relieved their anxiety. Furthermore, 6 out of 10 people believe that a good rapport with the dentist would lower their anxiety. These results were in agreement with the previous literature[5,6,12].
The environment of the dental operatory room, equipment and design has a significant role when it comes to dental anxiety. Previous studies have reported that colour schemes, furniture, music, lighting and dental equipment (drills, scalers, forceps, injections etc.) influence the anxiety of patients[3,11] .Colors like green, red, yellow and blue with soft textures create a calming ambience. Comfortable furniture, including a dental chair, a clean environment and equipment, as well as sharp instruments and blood outside sight, minimizes dental anxiety[14]. Moreover, noise pollution from drills and other equipment like suction machines and compressors can cause anxiety in patients[15]. Previous literature has reported that complex multiple-visit procedures provoke fear in patients[16-18] .The complex procedures involve surgical extractions, endodontic procedures including management of endodontic mishaps, implants and maxillofacial surgeries[19,20] .In the current study, public institute patients reported higher anxiety levels for various factors, such as dental office ambiance, waiting room environment, and complex procedures.

Dentist attire has been reported to have a significant association with patients' anxiety, especially in

pediatric patients. Similarly, a dental chair with good esthetics, comfort, design, functionality and stability lowers the anxiety of patients[14,21-24]. Moreover, in addition to strengthening trust and rapport, other factors like clean sterilized instruments, waiting room management, clinic design, calm, friendly environment play an important role in alleviating dental anxiety[18-25].In the current study, a higher proportion of females and participants from public dental institutes were triggered by the attire of the dentist, which may be associated with perceptions of professionalism, hygiene, or past experiences.

The findings suggest that public dental institutes may need more tailored anxiety management programs to address the specific triggers faced by their patients. These programs could include targeted interventions, such as relaxation techniques, enhanced patient-dentist communication, and environment modifications specific to the needs of public institute patients. Transparency and patient education should be integral components of dental care to reduce fear and build trust.

CONCLUSION

Females were more likely to experience dental anxiety compared to males. There were significant differences in the triggers and relieving factors of dental anxiety between patients from private and public dental institutes. Respondents from public dental institutes reported more frequent triggers of dental anxiety compared to those from private institutes. Key anxiety triggers identified included dirty instruments, a negative waiting room environment, mismanagement, and fear of complex procedures. Conversely, major relieving factors reported were good rapport with the dentist, receiving reassurance during treatment, organized appointments, and a calm waiting room ambiance. These factors were essential in reducing anxiety for patients in both private and public institutes.

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CONFLIT OF INTEREST

Authors declare no conflict of interest.

ETHICAL APPROVAL

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PATIENT CONSENT

The consent and confidentiality statement was mentioned in the questionnaire.

AUTHORS' CONTRIBUTION

HH: Conception and design, Critical revision of the manuscript for important intellectual content, Statistical expertise Methodology, Investigation, Data curation, Draft preparation. FFC: Conception and design, Analysis and interpretation of the data, Drafting of the article, Investigation, Data curation, Draft Preparation. MIAM: Conception and design, Critical revision of the article for important intellectual content, Drafting of the manuscript, Data curation. UW: Collection and assembly of data, Drafting of the manuscript, Data analysis, Interpretation of results.AS: Literature search, Critical revision of the manuscript for important intellectual content, Data interpretation, Proofreading. AUH: Literature search, Critical revision of the manuscript for important intellectual content, Drafting of the manuscript.

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REFERENCES

1. O'Grady A, Gray-Burrows K, Tahmassebi J. Inside the waiting room: Process drama and dramatic distancing for involving children in research on dental anxiety. Arts Health. 2022 May;14(2):149-64. https://doi.org/10.1080/17533015.2021.1894465
2. Chishti F, Hassan H, R. Qazi S. Dental anxiety among students of Lahore, Pakistan. Pak J Med Health Sci. 2021 Sep;15(9):2659–61. https://doi.org/10.53350/pjmhs211592659
3. Hoffmann B, Erwood K, Ncomanzi S, Fischer V, O'Brien D, Lee A. Management strategies for adult patients with dental anxiety in the dental clinic: a systematic review. Aust Dent J. 2022 Mar;67:S3-13. https://doi.org/10.1111/adj.12926
4. Enright A, Enright S. Dental anxiety and phobia – Causes, impacts, and treatment. Dent Oral Maxillofac Res. 2021 Feb;7(1):1-6. https://doi.org/10.15761/DOMR.1000384
5. Fux-Noy A, Zohar M, Herzog K, Shmueli A, Halperson E, Moskovitz M, et al. The effect of the waiting room's environment on the level of anxiety experienced by children prior to dental treatment: a case-control study. BMC Oral Health. 2019 Dec;19(1):294. https://doi.org/10.1186/s12903-019-0995-y
6. Sokoto KC, Platt LF, Alexander LA, Foxman B, Shaffer JR, Marazita ML, McNeil DW. Racism in oral healthcare settings: Implications for dental care-related fear/anxiety and utilization among Black/African American women in Appalachia. J Public Health Dent. 2022 Mar;82:28-35. https://doi.org/10.1111/jphd.12523
7. Org.pk. [cited 2022 Oct 17]. Available from: https://pide.org.pk/pdfpidere-search/wp-0032-health-care-services-and-government-spending-in-Pakistan.pdf?
8. Almutairi FJ. Dental Anxiety among Patients Attending King Saud Hospital in Unizah: Pilot Study.

Int J Dent Sci Res. 2020 Dec;8(6):155-8. http://dx.doi.org/10.12691/ijdsr-8-6-3
9. Butt H, Waheed Z, Khan NR, Shumyle DE, Shiekh H, Jafar T. Association of Dental Treatment Related Anxiety with Sterilization Concerns Among Patients. J Rehman Coll Dent. 2020 Dec;1(1):20-3. https://doi.org/10.52442/jrcd.v1i1.23
10. Abdullah MA, Shaikh BT, Ghazanfar H. Curing or causing? HIV/AIDS in health care system of Punjab, Pakistan. PLoS One. 2021 Jul;16(7):e0254476. http://dx.doi.org/10.1371/journal.pone.0254476
11. Vanhee T, Mourali S, Bottenberg P, Jacquet W, Vanden Abbeele A. Stimuli involved in dental anxiety: What are patients afraid of?: A descriptive study. Int J Paediatr Dent. 2020 May;30(3):276-85. http://dx.doi.org/10.1111/ipd.12595
12. Yuan S, Freeman R, Hill K, Newton T, Humphris G. Communication, trust and dental anxiety: A person-centred approach for dental attendance behaviours. Dent J. 2020 Oct;8(4). http://dx.doi.org/10.3390/dj8040118
13. Aardal V, Evensen KB, Willumsen T, Hervik Bull V. The complexity of dental anxiety and its association with oral health-related quality of life: An exploratory study. Eur J Oral Sci. 2023 Feb;131(1):e12907. https://doi.org/10.1111/eos.12907
14. Song ES, Kim WH, Lee BH, Han DW, Lee JH, Kim B. Assessment of Color Perception and Preference with Eye-Tracking Analysis in a Dental Treatment Environment. Int J Environ Res Public Health. 2021 Jul;18(15):7981. http://dx.doi.org/10.3390/ijerph18157981
15. Hoffmann B, Erwood K, Ncomanzi S, Fischer V, O'Brien D, Lee A. Management strategies for adult patients with dental anxiety in the dental clinic: a systematic review. Aust Dent J. 2022 Mar;67 Suppl 1(S1):S3–13. http://dx.doi.org/10.1111/adj.12926
16. Lin C-S, Lee C-Y, Chen L-L, Wu L-T, Yang S-F, Wang T-F. Magnification of fear and intention of avoidance in non-experienced versus experienced dental treatment in adults. BMC Oral Health. 2021 Dec;21(1):328. http://dx.doi.org/10.1186/s12903-021-01682-1
17. Dou L, Vanschaayk MM, Zhang Y, Fu X, Ji P, Yang D. The prevalence of dental anxiety and its association with pain and other variables among adult patients with irreversible pulpitis. BMC Oral Health. 2018 Dec;18(1). http://dx.doi.org/10.1186/s12903-018-0563-x
18. Hassan H, Zahid F, Ameer Malik MI, Shakoor A, Yaasir Z, Zeeshan M. Hand Hygiene and Cross Infection control among dental auxiliaries working in private and public dental institutes of Punjab. Pak J Med Health Sci. 2022 Dec;16(10):711–4. https://doi.org/10.53350/pjmhs221610711
19. Hassan H, Ali SM, Riaz S, Aziz S, Saleem MN, Raja HZ. Prevalence of endodontic mishaps and their management in private and public dental institutes in Punjab, Pakistan. Rawal Med J. 2023 Jun;48(2):468–468. https://www.rmj.org.pk/?mno=79757
20. Hassan H, Rafique A, Andleeb S, Javaid M, Ahmad H, Khalid S. Post-insertion complaints associated with complete denture prosthesis in a tertiary care hospital. Rawal Med J. 2023 Mar;48(1):200–200. https://www.rmj.org.pk/?mno=81263
21. Armfield JM, Heaton LJ. Management of fear and anxiety in the dental clinic: a review. Aust Dent J. 2013;58(4):390–407. http://dx.doi.org/10.1111/adj.12118
22. Nithya S, Jeddy N, Radhika T, Jeddy N. Dental anxiety and influencing factors: A cross-sectional questionnaire-based survey. Indian J Dent Res. 2018 Jan;29(1):10. http://dx.doi.org/10.4103/ijdr.ijdr_33_17
23. Karan NB. Influence of lavender oil inhalation on vital signs and anxiety: A randomized clinical trial. Physiol Behav. 2019 Nov;211(112676):112676. http://dx.doi.org/10.1016/j.physbeh.2019.112676
24. Zinke A, Hannig C, Berth H. Comparing oral health in patients with different levels of dental anxiety. Head Face Med. 2018 Dec;14(1):25. http://dx.doi.org/10.1186/s13005-018-0182-4
25. 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;10(12):2352. http://dx.doi.org/10.3390/healthcare10122352