

The prevalence, causes, and relativity of dental anxiety in adult patients to irregular dental visits

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ABSTRACT

الأهداف: تقييم مدى إنتشار ظاهرة القلق من علاج الأسنان والعوامل المسببة لها .

الطريقة: أجريت دراسة مقطعية لتحديد مدى انتشار ظاهرة القلق من علاج الأسنان باستخدام (مقياس السؤال العالمي للقلق من علاج الأسنان) . وشارك فيها 1025 مريضاً راجعوا في عيادات كلية طب الأسنان بجامعة الدمام خلال فترة من (مارس 2012م – فبراير 2013م)، تم توزيع إستبيان يحتوي على عدة أقسام، القسم الاول غطى البيانات الشخصية ، القسم الثاني هدف الى تحديد مدى الانتظام في زيارة طبيب الأسنان والاسباب المتعلقة بها، والقسم الثالث تناول الأسباب المثيرة للقلق داخل عيادات الأسنان في حين ناقش الجزء الأخير توصيات المرضى للتغلب على قلقهم .

النتائج: وجد أن 27% من المشاركين لديهم قلق من علاج الأسنان . الألم كان الدافع الأساسي لمراجعة طبيب الأسنان (43.8%) . السبب الأساسي للخوف من علاج الأسنان كان الخوف من حقنة التخدير (88.2%) ، في حين كانت العمليات الجراحية والخلع أكثر المعالجات خوفاً (35.7% & 23% على التوالي) . ضيق الوقت (79.5%) ، تكلفة العلاج (71.5%) بعد عيادات الأسنان (62.2%) وعدم وجود سبب معين (31.3%) كانت أسباب أخرى ذكرت من قبل المشاركين لعدم إنتظامهم في زيارة طبيب الأسنان .

الخاتمة: بالرغم من التقدم الهائل في طب الأسنان من حيث تخفيف الألم ، إلا أن ظاهرة القلق من طبيب الأسنان تستمر في الانتشار مما يستدعي الانتباه لعوامل أخرى تلعب دوراً في هذه الظاهرة كالعلاقة بين الطبيب والمريض ومهارات التواصل عند الطبيب . كما ينبغي وضع حلول للأسباب الأخرى في عدم الإنتظام في زيارة طبيب الأسنان كالتوزيع المتساوي لعيادات الأسنان وتقليل تكلفة العلاج .

Objectives: To assess the frequency and causes of dental anxiety and their relation to irregular dental visits among adult dental patients.

Methods: The Dental Anxiety Question (DAQ) included within a self-administered questionnaire was distributed to 1025 patients attending the Interns' Dental Clinics in the Department of Preventive Dental Sciences, College of Dentistry, University of Dammam, Dammam, Kingdom of Saudi Arabia from March 2012 to February 2013. A cross-sectional study design was used. The questionnaire consisted of 22 closed-ended questions divided into 4 sections; 1) demographics, 2) regularity of dental visits, and related causes, 3) DAQ, cancellation of dental appointments, history of previous trauma, dental anxiety provoking factors within dental environment and procedures, and 4) patients' status in dental clinics, preferences of dentists, and perceptions regarding dental anxiety.

Results: The prevalence of dental anxiety among the study sample was 27%. Anesthetic injection was the main factor of dental fear (88.2%), while dental surgical procedures (35.7%) and extractions (23%) were the most terrifying dental procedures. Lack of time (79.5%), cost (71.5%), far-situated dental services (62.2%), and fear (57.1%) were causes listed for irregular dental visits; while 31.3% had no specific reason. Irregular dental visits were not related to dental anxiety.

Conclusion: Dental anxiety continues to be an obstacle despite the vast improvement in dentistry; and this raises an alert regarding personal and communication factors in the patient-dentist relationship. Factors such as equal distribution of dental services, time, and cost should also be addressed.

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The Kingdom of Saudi Arabia has noticed a huge gap in dental industry and manpower. Yet, the incidence of oral health diseases seems unchangeable. This in turn raises questions on barriers for utilization of these services. Dental anxiety has been, and will continue to be, one vital reason for the avoidance of dental care by many patients.^{1,2} The prevalence of dental fear or anxiety also seems stable through the past 20 years.³⁻⁵ Female patients, younger-aged, singles, and those with lower educational attainment have consistently shown more dental anxiety.⁶⁻⁸ Anxious patients; however, do not necessarily become dental avoiders as many patients attribute their irregular follow-up to the lack of time and the high cost of dental treatment.^{9,10} Patients with various degrees of anxiety constitute a problematic issue, as they require more office time and empathy that stressed dentists lack due to job-related factors and personal external factors. These factors will in turn increase the patient's anxiety. This circle is also influenced by the dentist age, gender, and experience.^{4,11,12} Skipping dental visits due to anxiety will aggravate oral health problems, which in turn will affect individual's self-esteem, performance, and financial status.¹³⁻¹⁵ However, handling and managing anxious patients is a time and effort consuming process. Dental anxiety is a relevant problem that can affect the dentist, the patient, and the entire society. Nowadays, the role of mass media in educating the public cannot be denied in decreasing the impact of dental anxiety; on the other hand, the media might intensify the fear of the public about infectious, blood-borne diseases and even microbial load of dental unit waterlines.⁵ The persistent question in this context is: Why does oral health disease continue to impose a real burden, despite the great improvement in dental services and pain control, especially in the developing countries? On the other hand, barriers or factors behind irregular dental visits have been spelled-out in many dental anxiety studies, but with no separate investigation.¹ Recognizing factors that lead to irregular dental visits can, in turn, lead to oral health improvement and saving money, time, and effort. The aim of this study was to assess the frequency of dental anxiety, its causes, provoking factors in dental clinics, and its relation to irregular dental

visits. Moreover, it aimed at investigating other causes of irregular dental visits, and identifying participants' perceptions to overcome dental anxiety.

Methods. A cross-sectional analytical questionnaire-based survey, with a non-probability consecutive sampling (time-bond) was used. The study was conducted in the Interns' Clinics at the College of Dentistry, University of Dammam, Kingdom of Saudi Arabia, from March 2012 to February 2013, during working hours (8 a.m. – 4 p.m.) excluding holidays. The study included all new, adult patients (≥ 18 years) who attended the clinics during the study period and who agreed to participate. Young adults (teenagers), children and adults who appear physically ill or disabled were excluded from the study. The participants were asked to complete the questionnaire while waiting for their turn. The purpose of the questionnaire and the time needed to complete it (3-5 minutes) were explained by the receptionist, and in the covering letter that accompanied the questionnaire sheet. Since participation was voluntary, the act of completing the questionnaire was conceived as an act of consent.

A self-administered structured questionnaire consisting of 22 closed-ended questions was divided into 4 sections as follows: i) The first section covered the demographic data. ii) The second section assessed the following areas: major complaints, beginning of current symptoms, last visit to dentist, regularity of dental visits, and their causes. iii) The third section included a global question on dental anxiety (Dental Anxiety Question [DAQ]; answered only with yes or no), cancellation of dental appointments, history of previous trauma and dental anxiety provoking factors in the dental environment and procedures. iv) The last section investigated patients' status while waiting or while being in the dental chair, oral health status of the patients as perceived by them, in addition to preference factors of their treating dentist including age, gender, and qualifications. The questionnaire ended with a question for recommendations to lessen or combat dental anxiety.

Prior to the actual implementation, the questionnaire was reviewed and ethically approved by the Research Committee of the College of Dentistry, University of Dammam, Dammam, Saudi Arabia. Furthermore, the survey was piloted with 16 patients. No changes were deemed necessary after piloting.

We used DAQ, a single item construct, in the study to measure dental anxiety; which has been found to be valid and reliable by Neverlien¹⁶ in a nationwide randomized study on the Norwegian adult population.

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The DAQ was later used in many studies and proven valid and reliable.^{12,16-18} The DAQ is a one-item construct: "Are you afraid of going to the dentist?" with possible responses of "no", "a little", "yes, quite" and "yes, very" and was scored from 1-to-4. As the purpose of this study is meant to assess presence or absence of dental anxiety only, regardless of the degree of severity; the question was presented with only 2 responses "yes" or "no".

The Statistical Package for Social Science (SPSS Inc., Chicago, IL, USA) Version 19 was used. The frequencies and percentages described the demographic data such as gender, age groups, previous dental trauma, dental procedures, and causes of irregular visits, reasons of fear of the dentist, and recommendations of participants. Cross-tabulation was conducted for dental anxiety and chi-square test was applied to compare the factors associated with dental anxiety. Logistic regression analysis was applied to measure the odd ratios. All data were presented in the form of frequency tables and graphs.

Results. Out of the 1025 questionnaires that were distributed, 966 were considered for analysis (29 questionnaires were disregarded due to incomplete information). There was almost a fair representation of males (54.6%) and females (45.4%). From the study sample, 56.2% were aged between 18 and 20 years, and the mean age was 22.19±14.70 years. Age was categorized in a range from 20 to >41 years into

3 sub-groups as follows: 21-30 years, 31-40 years, and >41 years. In addition a different age group 18-20 years (young adults), was added to monitor the effect of age on dental anxiety. A statistically significant difference ($p<0.001$) was found between female gender and dental anxiety (Table 1); while an adverse relation was found with age (Table 1), the younger the age the higher the anxiety ($p=0.02$). Of all participants, 51.4% held a secondary school diploma ($p=0.074$), 53.7% were married ($p=0.110$), and 87.2% lived in urban areas ($p<0.001$). However, there was a wide variation in the participants' occupations.

When answering the DAQ: "Are you afraid of going to the dentist? Out of 966 participants, 875 responded to this question, 236 (27%) of whom had dental anxiety (responded with "YES") and 639 had no dental anxiety (responded with "NO").

Pain was the major complaint for 43.8% of the participants while only 29.3% of them were attending a follow-up appointment. Only 18.7% of the participants sought dental care within a few hours from the inception of their current symptoms or main complaint. The rest, however, visited the clinic days, weeks and even months after the inception of the symptoms. With regards to the frequency of dental visits, 53% reported that they do not visit the dentist regularly ($p=0.169$). Lack of time was the main cause behind irregular dental visits, followed by cost, far-situated dental services, and fear. However, (31.3%) said they had no specific reason. Table 2 shows the reported reasons for irregular visits

Table 1 - Dental anxiety significant relationships.

Variables	Dental anxiety (n=236)	No dental anxiety (n=639)	P-value	Odds ratio (95% CI)
<i>Gender</i>				
Male	82 (37.3)	386 (61.8)	<0.001	2.71 (1.98-3.73)
Female	138 (62.7)*	239 (38.2)		
<i>Age (years)</i>				
≤20	153 (65.1)*	340 (54.2)	0.026	1.80 (1.17-2.77)
21-30	7 (3.0)	28 (4.5)		1.00 (0.40-2.50)
31-40	43 (18.3)	131 (20.9)		1.31 (0.78-2.20)
>40	32 (13.6)	128 (20.4)		
<i>Previous dental trauma</i>				
Yes	123 (53.7)*	146 (24.1)	<0.001	3.70 (2.68-5.09)
No	105 (45.9)	461 (75.9)		
<i>Dental procedure</i>				
Extraction	23 (15.4)	24 (31.2)	<0.001	2.71 (0.38-1.60)
Surgery	41 (27.5)*	33 (42.9)		2.09 (0.68-6.47)
Root canal	53 (35.6)	6 (7.8)		0.29 (2.72-18.6)
Scaling	15 (10.1)	9 (11.7)		1.56 (0.52-3.45)
Filling	13 (8.7)	5 (6.5)		

CI - confidence intervals, *Shows statistical significance of result at 5% level of significance. Percentage (%) is calculated from the total responses under each category. Out of the 966 participants only 875 answered the dental anxiety question

to the dentist. Cancellation of dental appointments was practiced by (30.4%) of the sample; but the majority show up for their appointment regularly ($p < 0.001$). Most of the sample (68.1%) did not have a previous dental trauma, with only 31.7% who had a pre-painful experience in dental care; nevertheless, it has a strong impact on dental anxiety ($p < 0.001$) (Table 1). When the reason for dental anxiety was further explored, fear of dental injection was the main reason (88.2%); other reasons included embarrassment from one's oral health status, concerns on sterilization and disinfection, fear of dental equipment, and the type of the dental procedure itself (Table 3).

Surgery and dental extraction were reported as the most scaring procedures, with a strong statistical relation with dental anxiety ($p < 0.001$) (Table 1). When investigating factors of fear within the different types of dental procedures: 93.4% mentioned pain; 71.4% were afraid to lose control; 65.1% said they feared acquiring an infectious disease, and 63.4% were afraid from post-operative complications. From the study sample, 57.1% claimed they were calm while waiting for their turns, 35.5% admitted to be anxious, and only 7.4% were terrified (had symptoms that ranged from nausea to fainting) in the waiting time ($p < 0.001$). Almost an equal percentage was obtained when addressing the same question, but being in the dental chair: 66.1% were feeling calm, 27.8% experienced anxiety, and 6.1% suffered from panic symptoms. Oral health status was moderate in half of the sample (51.2%) as perceived by the patients ($p < 0.001$). On exploring the effect of the dentist's characteristics on patients' fear, 48.1% reported that the gender or age of the dentist makes no difference to them. Interestingly, 65.4% preferred to be treated by a general dentist (GP) rather than a specialist ($p = 0.007$).

Suggestions that would encourage regular dental visits and overcome dental anxiety as set by the patients included: need for Health Education ($p < 0.001$), need for pre-appointments with the dentist before treatment, importance of pain-free dentistry through the use of pre-operative sedations and/or nitrous oxide gas ($p < 0.001$), the role of the dentist's attitude ($p = 0.401$), and increasing the number of dental centers, and clinic decoration (Table 3).

Discussion. According to recent surveys, a limited number of large scale or nationwide dental anxiety studies have been conducted in Saudi Arabia nor in the Eastern Province. The prevalence of dental anxiety in this study was 27% while the range worldwide is between 5% and 20%.^{3,4} This slightly higher percentage

Table 2 - Distribution of the study sample according to causes of irregular dental visits (N=875).

Causes of irregular dental visits	n	(%)
Fear	569	(57.1)
Time	793	(79.5)
Cost	713	(71.5)
Distance	620	(62.2)
Not specific cause	312	(31.3)

Table 3 - Causes of dental anxiety and recommendations to overcome it as perceived by study participants (N=875).

Variables	n	(%)
<i>What makes you afraid of the dentist?</i>		
Ashamed of my oral status	701	(70.3)
Sterilization and disinfection	640	(64.2)
Dental examination & its equipment	671	(67.3)
Anesthesia injection	879	(88.2)
Type of dental procedure	639	(64.1)
<i>Recommendations of participants to overcome dental anxiety</i>		
Oral health education	871	(87.4)
Previous meeting	755	(75.7)
Pain-free dentistry	879	(88.2)
Decoration & equipment of clinic	97	(9.7)
Increase number of dental centers	139	(13.9)
Good dentist-patient relation	411	(41.2)

can be attributed to the demographic factors of the participants in this study, such age that is inversely related to dental anxiety⁴ as 54.9% of the sample were aged 18-20 years old; not to mention the probable influence of female gender (approximately similar percentage of males (54.6%) and females (45.4%)), who usually show higher levels of dental anxiety, in addition to the low educational level present in this sample, only 28.2% had a higher level of education. It is also noticed that dental anxiety studies carried out in eastern societies (this is the first published study in the eastern province) usually tend to show higher provenances,¹⁹⁻²¹ and although the sample cannot be considered representative of the Saudi population, it can be generalized as patients attending the College Clinics came from different areas of the Eastern Province.

Demographic factors had no impact in this study such as participants' occupation (the wide variation made it difficult to establish a correlation with dental anxiety) and the marital status ($p = 0.110$). While the latter played a role in other studies as singles usually reported higher degrees of dental anxiety.⁶ This difference can be attributed to cultural backgrounds

and/or oral health literacy of the low-educated study participants. The main complaints did not influence dental anxiety as anxious patients (usually driven by their fear) tend to manage their pain by painkillers and traditional medicine until the pain grows unbearable. Most patients reported after periods ranging from days to months from the beginning of their symptoms or major complaints; in agreement to Aldosari's²¹ study. Pain is a 2-sided weapon although it was the major cause for seeking dental care; yet it was the cause of dental avoidance similar to the findings of Eitner et al.¹³ Although several studies have closely linked dental anxiety to irregular dental visits;^{1,13,20} no correlation has been found between dental anxiety and irregular dental visits ($p=0.169$), the same was reported by Aldosari.²¹ This could be attributed to the emergent nature of the dental visits (namely, pain-driven visits) for the participants in both studies and the cultural similarities. Lack of time and cost, and distance to the dental clinics were the major factors that lead to irregular dental visits. It is therefore, believed that increasing access to dental care (namely, more dental clinics) would reduce the 2 reasons for irregular visits (namely, lack of time and cost). On the other hand, the introduction of pain-free dentistry and mass media can ease the issue of dental anxiety. Cancellation of dental appointments was found to be closely linked to dental anxiety in many studies^{1,2,9} and can be an indication of an avoidance behavior; yet this was not the case in our study, which again probably can be due to the emergent nature of dental clinics in the study area. A similar explanation was presented by AlBarakati,²² when investigating reasons behind broken dental appointments among Saudi female patients. Previous trauma had a major role ($p<0.001$) in dental anxiety, a finding which is similar to a study carried among Saudi females in Riyadh by Al-Madi and Abdellatif.¹⁹

A contradiction with their finding that previous trauma was expected to lead to development of an avoidance attitude to dental treatment,²²⁻²⁵ which in turn was expected to cause high percentage of irregular visitors in this study, but it did not, due to the factors mentioned previously. Anesthetic injection and fear of infectious diseases were great concerns to patients in dental treatments. The other contradiction in this study is that: although the educational level was low, a high percentage of the sample had fear of infectious diseases (65.1%), and obvious concerns regarding the degree of disinfection and sterilization (64.2%); as an inverse relation was documented between educational level and fear of infectious diseases in many studies.^{4,25}

This could be attributed to the role played by the mass media. Dental anxiety had a significant association with individual status while waiting for his/her turn ($p<0.001$) in the waiting area; while these anxious feelings were decreased when sitting in the dental chair. This could be related to the assurance of the treating dentist or to the pain-relieving effect of the treatment. while Hmud and Walsh⁴ stated that anxious patients experience more worries and stress while waiting, which in turn increased their anxiety during dental treatment and pain perception. As mentioned earlier and by many studies, dental anxiety was closely linked to deterioration of oral health, an association that was shown in our study with a high significance ($p<0.001$), anxious patients develop an avoidance behavior as a result of their fear or a previous trauma, which in turn aggravates their oral health problems and treatment.^{8,13-15,17,22} Lack of motivation, decreased awareness and poor oral health education could be the reasons for those who did not mention a specific reason for their irregular dental visits. As stated by most of participants, time should be allocated to alleviate the anxiety prior to the actual treatment session, which could reduce the high level of anxiety reported by the participants; a solution that was strongly recommended by Singer et al.²⁶ There was no difference in demographic factors such as age or gender affecting patient-dentist preferences; on the other hand, specialty had a high influence in patients' preferences as most patients in this study preferred general dentists. This can simply be due to the enthusiasm and sympathy of fresh graduates, which the overwhelmed specialized dentists lack. On the other hand, it highlights the need for improving and emphasizing the role of communication skills and behavioral modification in dental anxiety.

This study provides a baseline for dental anxiety status among the Saudi population in the Eastern Province. In addition, it also sheds some light on various critical factors that dentists and stakeholders should consider to eliminate dental anxiety, which were not previously investigated; particularly the role of communication skills and/or the dentist's character. It also highlighted that dental anxiety provoking factors in the dental procedures or environment should be managed prior to dental treatment.

Study limitations. In addition to being a small scale study, conducted in interns' clinics, which are characterized by emergent patients, it is certain that the percentage of dental anxiety or prevalence obtained here would be much higher in private or specialty clinics.

The fact that the study was carried out in outpatients or emergency departments weakened the impact of certain anxiety-related factors such as cancellation of dental appointments and regularity of dental visits.

In conclusion, the prevalence of dental anxiety was found to be 27%. Females, young-age, and those from urban areas reported higher dental anxiety. Anesthetic injection, dental surgical procedures, and extractions were the most terrifying dental procedures. Pain was the major complaint. Irregular dental visits were not related to dental anxiety. The need for health education and pain management were the highly rated recommendations by the participants. The huge data on dental anxiety, its effect on dental visits and oral health will continue to contribute to similar studies in this area. There is an urgent need to investigate factors behind these long-standing figures of dental anxiety. Personality factors pertaining to both the dentist and the patient can still be an area for future research. The nature of dental anxiety itself as part of other psychological traits or exogenous factors should be analyzed. It is time other factors be addressed including cost and time of dental treatments, and the reasons behind oral health deterioration, as a consequence to irregular dental visits.

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