



Research Article

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Anxiety due to dental procedures and treatment among adult patients attending outpatient clinics in King Abdulaziz University Hospital, Jeddah, Saudi Arabia

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Abstract

Background: Anxiety is an emotion experienced by most of individuals at some time during their life. Oral health is an essential component of the overall public health, while dental anxiety can lead to deterioration of such health. The purpose of the study was to determine the prevalence and predictors of dental anxiety among patients attending outpatient clinics of King Abdulaziz University Hospital (KAUH), Jeddah. **Methods:** A cross-sectional study was conducted among a sample of 231 adult patients who attended the outpatient clinics of KAUH, Jeddah, during the year 2013/2014. A standardized interviewing questionnaire was used and contained Corah's Dental Anxiety Scale (DAS) was included. **Results:** The prevalence dental anxiety among participants was 50.6%. Females obtained a significantly higher mean DAS compared to males (Student's t-test = 3.78, $p < 0.001$). Dental anxiety was also higher among younger participants. Multiple linear regression model revealed that predictors of dental anxiety were the previous cancellation of dental appointment (t-test = 2.998, $p < 0.001$, B = 2.998), followed by memorizing poor dental practice, gender and age. The highest percentage of severe anxiety was related to dental extraction (46.0%). Sweaty hands (56.1 %) , fast breathing (21.5 %) & increased heart rates (13.6 %) were the commonest reported somatic manifestations accompanying visiting dentists. **Conclusions:** Dental anxiety represents a common problem among Saudi adults attending KAUH. Dental anxiety was predicted by cancellation of dental appointment(s), memorization of poor dental practice, gender and age. Enhancing awareness of the community about oral health and how to avoid dental anxiety through educational campaigns is recommended.

Keywords: Anxiety, dental, prevalence, predictors, Dental Anxiety Scale.

INTRODUCTION

The better the psychosocial health, the greater is the personal well-being and the ability to control troubles and lifelong problems^[1]. Mental conditions and subclinical psychological troubles can affect the physical health and may act as barriers for looking for necessary treatment and this will affect the public health. Furthermore, the physical conditions may increase the risk of mental illness^[2].

Anxiety is an emotion experienced by most of individuals at some time during their life. The severity and the causes behind it determine whether it is considered a normal or abnormal reaction. This feeling can occur with or without certain triggering stimulus^[3, 4]. Anxiety and its related conditions are among the most common psychological disorders in the general population^[3]. Moreover, the discomfort response to fear can range from sense of apprehension to physical symptoms as tachycardia, difficulty in breathing, sweating and dizziness as a consequence of danger^[5, 6].

The oral health is a fundamental part of the overall public health. While, dental anxiety may have a crucial impact on the deterioration of oral health^[7]. Dental anxiety or dentophobia is the "abnormal panic caused when meeting dentist for prophylactic treatment and dental procedures". It represents a condition of fear that something terrible is going to happen in dental management, and it is often combined with a sense of losing control^[8]. It is a problem of many patients. Excessive dental fear leads to bad oral health and poor Quality of Life. This also affects the doctor-patient relationship, may interfere with proper dental treatment and cause serious dental-medical squeal with their psychosocial effects^[7, 9, 10]. Many people are embarrassed about their mouth condition^[9] and they may avoid talking or laughing in community which, also, produces fear^[11].

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Dental anxiety is a global problem that affects a lot of patients and represents a big challenge to health care providers [12, 13]. It is estimated that about 36% of the world population are suffering from dental anxiety and 5- 15% of adults in developed countries suffering from severe pathological anxiety to dental treatment. Furthermore, about 3% of populations avoid going to the dentist due to dental fear [11, 14]. Dental anxiety may cause severe problems with negative effects on oral health. In addition, it can be seen as a multifaceted compound problem, in which there are many psychological and physiological etiologies for its development [12].

Limited numbers of epidemiologic studies were done on dental anxiety among adults in Saudi Arabia [13, 15]. To the best of our knowledge, no studies were conducted to determine the prevalence and predictors of dental anxiety in Jeddah, so such study is needed.

The purpose of the study was to determine the prevalence and predictors of dental anxiety among patients attending outpatient clinics of King Abdulaziz University Hospital, Jeddah, Saudi Arabia.

METHODS

This study was approved by the Institutional Review Board of Faculty of Dentistry, KAUH. It was done in accordance with the ethical standards of the Helsinki Declaration. All patients were given a brief clarification of the study, and an informed written consent was obtained from each accepted patient. Administrative approvals were also taken.

A cross-sectional study was conducted at KAUH during the educational year 2013/ 2014. The study populations were patients aged from 18-60 years of both sexes, who attended the Outpatient Clinics of KAU (either dental or non-dental clinics) and accepted to participate in the study in the day of the interview. The exclusion criteria were patients who have mental problem(s) that may hinder their ability to recognize the questionnaire. Most of the patients attending KAUH are Saudis, with varying socioeconomic backgrounds. A non-probability convenience sampling method was used. The sample size was determined using the formula [16]:

$$n = \frac{z^2 \times p \times q}{d^2}$$

n=the minimum sample size, Z=constant (1.96). A prevalence of 0.27 was assumed based on a previous study [17]. So, p=0.27 and q=1-0.27= 0.73, d=0.06. At confidence level of 95%, the minimum sample size was 210. The sample was increased during the field work to reach 231 participants to include and represent all groups of participants.

A standardized, anonymous & interviewing questionnaire was used. The questionnaire consisted of close ended questions inquired about personal and socio-demographic data, and factors that may affect dental anxiety. Stimuli that provoke dental anxiety as pain, instruments were also inquired. In addition, previous cancellation of dental appointment(s) due to fear and memorization of poor dental practice were asked. Somatic symptoms accompanying the dentists' visits were asked. If any of the symptoms present, the type was inquired (increased heart or respiratory rates, sweaty hand, etc.).

In addition, Corah's Dental Anxiety Scale (DAS) was used. It consists of four questions and each one has five points Likert responses. These responses range from "relaxed" coded as "1", to "so anxious" coded as "5" [18]. The last assessment of the level of anxiety is given by summation of points of scale items as following: "lowest score through 8 means no anxiety, 9 - 12 means moderate anxiety, 13 - 14 means high anxiety, and 15 - 20 means severe anxiety bordering on phobia" [19].

DAS is the most widely used scale [20] as it is "a simple, easy to score, short, valid, and reliable test for dental visit associated anxiety" [21-23]. It has a high level of internal consistency reliability and provide acceptable sensitivity, specificity and negative predictive value [24]. The reliability of the Corah's DAS was assessed among our study population by Cronbach's α and was found to be 0.82. The content and face validity of the questionnaire were assessed by 2 experts.

Data analysis

The data were analyzed using SPSS 20 (SPSS Inc., Chicago, IL). Descriptive statistics were done. The independent sample t-test was performed to compare between two means. A multiple linear regression model was constructed to determine the predictors of dental anxiety. The level of significance was set at p < 0.05.

RESULTS

The total number of study participants amounted to 231, with a response rate of 90 %. Their mean age was 28.6 ± 10.3 years. It was found that 74.4% of participants had less than university degree or were students, and 87.0% had non-professional job. The majority of participants had enough or enough and exceeding income (90.4%).

The score Corah's DAS ranged from 4 - 17 with a mean of 9.06 ± 2.8.

Figure (1) shows that 49.4% of participants were free from dental anxiety, while the prevalence of dental anxiety was 50.6 %. Regarding the grade of anxiety, 30.7%, 10.8% and 9.1% suffered from moderate, high and severe levels, respectively.

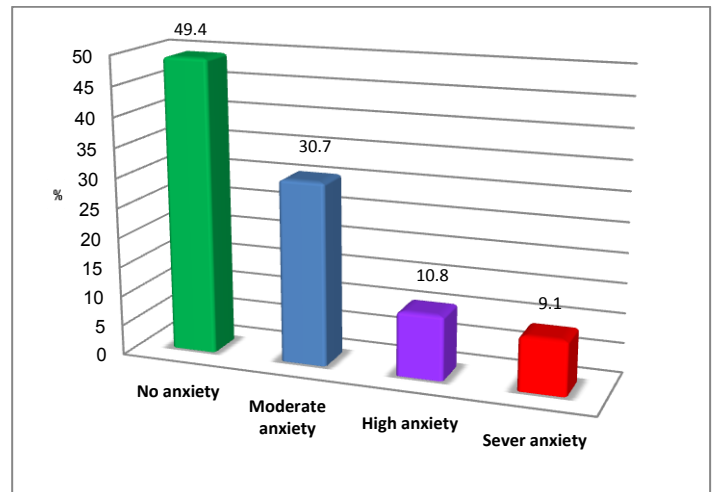


Figure 1: Degrees of dental anxiety among patients attending outpatient clinics in King Abdulaziz University Hospital, according to Dental Anxiety Scale

Table (1) reveals that females obtained much higher mean DAS (9.37 ± 3.0) compared to males (6.69 ± 2.3), a difference that was highly statistically significant (Student's t-test = 3.78, p < 0.001). The mean DAS was also higher among younger (≤ 40 years) compared to older participants (40-60 yrs), with a statistical significant difference (Student's t-test = 3.29, p < 0.01). Furthermore, patients reported previous cancellation of dental appointment due to fear obtained a higher mean DAS (11.94 ± 2.9) compared to others (8.55 ± 3.1), with a highly statistically significant difference (Student's t = 5.63, p < 0.001). Those memorizing poor dental practices had a higher DAS compared to other participants (Student's t = 2.37, p < 0.05). Patients attended dental clinics had a significantly (p < 0.01) lower mean dental anxiety scale compared to those attended other clinics.

Table 1: Comparison between the mean anxiety scale according different study variables among patients attending outpatient clinics in King Abdulaziz University Hospital

Variable	No.	Mean dental anxiety scale	SD	Students' t- test	(p)
Gender					
Male	26	6.69	2.3	- 3.78	(< 0.001)
Female	205	9.37	3.0		
Age					
≤ 40	203	9.34	3.1	3.29	(< 0.001)
>40	28	7.07	2.04		
Education					
Less than University & students	86	8.95	2.6	- 0.30	(> 0.05)
University & above	59	9.14	3.0		
Occupation					
Nonprofessional	201	9.13	3.15	0.72	(> 0.05)
Professional	30	8.63	3.10		
Income					
Enough or exceed	209	9.03	3.0	0.49	(> 0.05)
Not enough	22	9.41	3.1		
Type of outpatient clinic					
Dental	81	8.22	3.0	2.73	(< 0.01)
Non -dental	150	9.52	3.2		
Memorizing poor dental practice					
Yes	67	9.91	3.1	2.37	(< 0.05)
No	164	8.72	3.0		
Cancellation of dental appointment due to fear					
Yes	35	11.94	2.9	5.63	(< 0.001)
No	196	8.55	3.1		
Pain exaggerated anxiety					
Yes	106	9.34	3.3	1.10	(> 0.05)
No	125	8.83	2.3		
Fear from dental instrument					
Yes	70	9.4	3.1	0.96	(> 0.05)
No	161	8.92	2.9		

Table (2) shows the results of multiple linear regression analysis. Dental anxiety was primarily predicted by previous cancellation of dental appointment due to fear (t-test =2.998, $p < 0.001$, $B = - 2.998$), followed by exposure to previous poor dental practice (t-test=3.032, $p < 0.01$, $B=2.073$), then female gender (t=2.998, $p < 0.001$, $B= 2.998$) and age ≤ 40 years.

Figure (2) demonstrates that visiting dentists for regular check-up or for receiving prophylaxis accompanied by no fear from the opinion of 91% and 81.5% of participants, respectively. On the other hand, visiting dentists for dental extraction and endodontic treatment are accompanied by a severe dental anxiety from opinion of 106 (46.0 %) and 59 (25.7%) of participants, respectively. The highest percentage of severe anxiety was related to dental extraction 98 (46%).

Figure (3) shows that sweaty hand and fast breathing were the commonest somatic disorders accompanying dental appointment and were reported by 130 (56.1 %) and 50 (21.5 %) of participants who had somatic symptoms, respectively. Increased heart rate was reported by 31 (13.6 %) while insomnia was reported by only by 20 (8.8 %) of participants.

Figure (4) illustrates that pain was the commonest 106 (45.9%) stimuli that make the patients anxious and afraid from visiting dental practice. Fear from dental instruments 70 (30.3%) was the second stimulus for dental anxiety. Furthermore, bad hygienic practice of the dentist was the trigger of anxiety for 28 (12.3 %) of participants.

Table 2: Multiple linear regression analysis of predictors of dental anxiety among adult participants attending the outpatient clinics at KAUH

	B	Stand. Beta	t-test	Sig. "p"	R	R ²	F	P
Constant	9.72				0.48	0.23	11.08	< 0.001
Cancelling a Dental appointment due to Fear	-2.998	-0.308	-5.190	0.000				
Memorizing poor dental practice	2.073	0.194	3.032	0.003				
Gender	1.820	0.165	2.754	0.006				
Age (≤ 40 years)	-1.628	1.65	-2.559	0.011				

B: Un-standardized coefficients
Stand. Beta: Standardized Beta coefficients

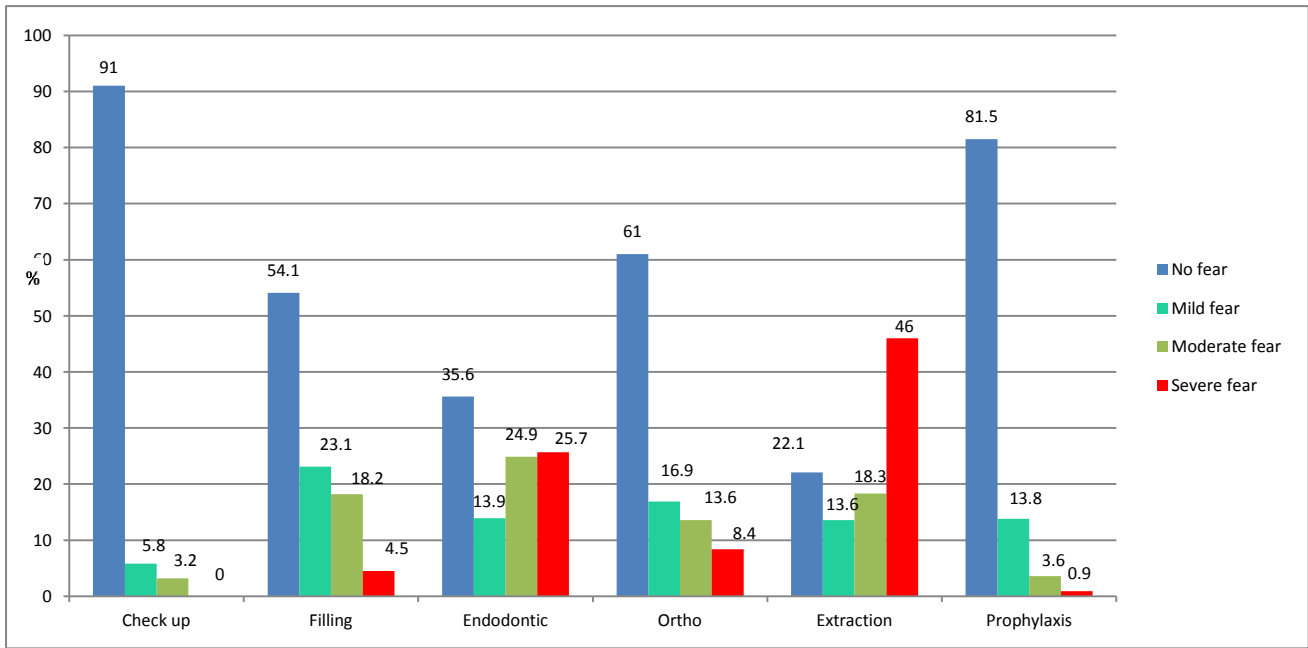


Figure 2: Degrees of dental anxiety by the type of dental maneuvers, as reported by patients attending outpatient clinics in King Abdulaziz University Hospital

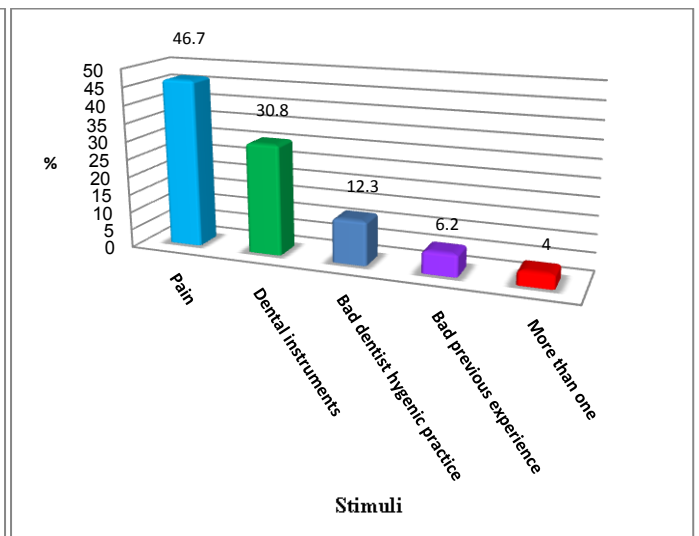
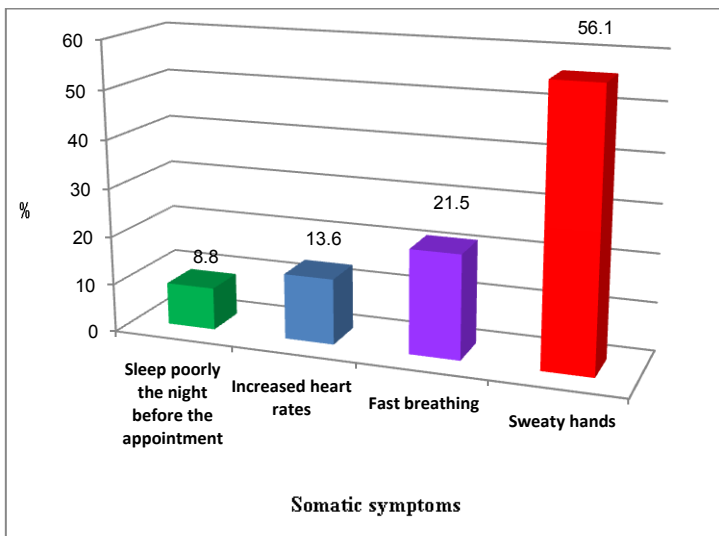


Figure 3: Reported somatic symptoms accompanying dental appointment among patients attending outpatient clinics in King Abdulaziz University Hospital

Figure 4: Reported stimuli which provoke dental anxiety among patients attending outpatient clinics in King Abdulaziz University Hospital

DISCUSSION

Anxiety disorders are the most frequently occurring psychiatric problem among the general population^[25]. Dental anxiety has been, and will continue to be one critical reason for avoidance of dental care by many patients^[26]. The prevalence of dental anxiety in the current study was 50.6%. This result agrees with results of two studies from India^[4, 27]. On the other hand, our prevalence was greater than 2 studies of Locker, *et al*^[28, 29] and Kanegane, *et al*^[30]. These differences may be attributed to differences between the study populations or to the type of anxiety scale used.

Regarding the degree of dental anxiety, our results found that 30.7%, 10.8% and 9.1% of the participants suffered from moderate, high and severe levels of anxiety, respectively. The corresponding rates among adults from Bulgaria^[19] were 35.5%, 18.2% and 11.7%, respectively. On the other hand, the study of Marya, *et al*^[27] reported that severe anxiety was only 4.38%, which is lower than the rate reported from the current study. This may be due also due to differences between the two target populations.

The mean DAS in the current study was much higher among females compared to males. This may be because adult men are more psychologically steady compared to females. This is proved to be comparable with other studies from Sri Lanka^[31], Turkey^[32], Jordan^[33], Norway^[34] and Nigeria^[22]. On the other hand, Kirova, *et al*^[19] showed absence of this variation between both genders from Bulgaria. This discrepancy may be due to ethnic variation.

Our results found that younger participants obtained higher dental anxiety scale compared to older patients. This agrees with studies of Appukkuttan, *et al*,^[35] Marya, *et al*^[27] and Kirova, *et al*^[19].

It is observed from the current study that educational level was not related to dental anxiety which coincides with the results of Malvania, *et al*^[4]. On the other hand, Kirova, *et al*^[19] showed that there is a level of education had positive influence on reducing dental anxiety. This discrepancy might be due to differences between the two populations.

In the current study the cancellation of dental appointments was the first predictor of dental anxiety which goes online with the results of other studies^[9, 36].

Participants in the current study reported that dental extraction and endodontic treatment have the highest severity of the fear (46.0%), (25.7%), respectively. The two procedures share exposure to dental injections for anesthesia. Dental injections may be the most feared aspects of dental treatment. Udoye, *et al*^[37] from Nigeria and Gaffar, *et al*^[13] from Dammam, Saudi Arabia also found that the extraction had a high scale on the dental anxiety scale.

Symptoms of anxiety usually result from an over activated sympathetic nervous system include an increased heart rate, sweating, etc^[25]. In the current study, about half of participants (49.1%) reported having physiological response as psychosomatic symptoms before visiting dentists (sweaty hand, tachypnea, tachycardia and insomnia). Quteish, *et al*. 2001^[15] reported that the increased heart rates was the commonest physiological response to the fear from dental treatment.

Regarding stimuli, a previous study reported in 2002 showed that pain was the major perceived sources of reported fear reactions^[38]. This result agrees with our results. The present study showed that tooth extraction is the most common reason for severe dental anxiety. This is similar also to results from two studies done in 2013^[17, 39].

CONCLUSION

The current research revealed that dental anxiety was a common problem among the adult Saudi population; 30.7%, 10.8% and 9.1% of participants in the study suffered from moderate, high and severe levels of anxiety, respectively. Participants who cancelled dental appointment due to fear, who memorizing poor dental practice, females and younger participants were more prone to dental anxiety compared to others. Presence of pain was the most common reason for dental anxiety (45.9%). Anxious patients should be identified and managed appropriately by behavioral/pharmacological treatment. Increase awareness of the community about the problem by conducting educational campaigns in the shopping malls and the schools is recommended. Mass media can decrease the impact of dental anxiety through educating the public on how to avoid dental anxiety.

Conflict of interest: The authors declare that no conflict of interest and no fund.

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REFERENCES

1. Ibrahim N, Al-Kharboush D, El-Khatib L, Al-Habib A, Asali D. Prevalence and Predictors of Anxiety and Depression among Female Medical Students in King Abdulaziz University, Jeddah, Saudi Arabia. *Iran J Public Health*. 2013;42(7):726-36.
2. Crego A, Carrillo-Díaz M, Armfield JM, Romero M. From Public Mental Health to Community Oral Health: The Impact of Dental Anxiety and Fear on Dental Status. *Front Public Health*. 2014;2:16.
3. Roy J. Dental Anxiety in Future and Current Orthodontic Patients. 2011.
4. Malvania EA, Ajithkrishnan CG. Prevalence and socio-demographic correlates of dental anxiety among a group of adult patients attending a dental institution in Vadodara city, Gujarat, India. *Indian J Dent Res*. 2011;22(1):179-80.
5. Armfield JM. How do we measure dental fear and what are we measuring anyway? *Oral Health Prev Dent*. 2010;8(2):107-15.
6. Bay EJ, Algase DL. Fear and anxiety: a simultaneous concept analysis. *Nurs Diagn*. 1999;10(3):103-11.
7. Mehrstedt M, John MT, Tönnies S, Micheelis W. Oral health-related quality of life in patients with dental anxiety. *Community Dent Oral Epidemiol*. 2007;35(5):357-63.
8. Klingberg G, Broberg AG. Dental fear/anxiety and dental behaviour management problems in children and adolescents: a review of prevalence and concomitant psychological factors. *Int J Paediatr Dent*. 2007;17(6):391-406.
9. Armfield JM. What goes around comes around: revisiting the hypothesized vicious cycle of dental fear and avoidance. *Community Dent Oral Epidemiol*. 2013;41(3):279-87.
10. Boman UW, Wennstrom A, Stenman U, Hakeberg M. Oral health-related quality of life, sense of coherence and dental anxiety: an epidemiological cross-sectional study of middle-aged women. *BMC Oral Health*. 2012;12:14.
11. Lenk M, Berth H, Joraschky P, Petrowski K, Weidner K, Hannig C. Fear of dental treatment—an underrecognized symptom in people with impaired mental health. *Dtsch Arztebl Int*. 2013;110(31-32):517-22.
12. Nigam AG, Marwah N, Goenka P, Chaudhry A. Correlation of general anxiety and dental anxiety in children aged 3 to 5 years: A clinical survey. *J Int Oral Health*. 2013;5(6):18-24.
13. Gaffar BO, Alagil AS, Al-Ansari AA. The prevalence, causes, and relativity of dental anxiety in adult patients to irregular dental visits. *Saudi Med J*. 2014;35(6):598-603.
14. Beaton L, Freeman R, Humphris G. Why are people afraid of the dentist? Observations and explanations. *Med Princ Pract*. 2014;23(4):295-301.
15. Quteish Taani DS. Dental fear among a young adult Saudi population. *Int*

- Dent J. 2001;51(2):62-6.
16. Wang WEI. Clinical Epidemiology-basic principles and practical applications. Edited by Wang WEI Beijing: Higher Education Press Publication. 2012;101.
 17. Sghaireen MG, Zwiri AM, Alzoubi IA, Qodceih SM, Al-Omiri MK. Anxiety due to Dental Treatment and Procedures among University Students and Its Correlation with Their Gender and Field of Study. *Int J Dent.* 2013;2013:647436.
 18. McGrath C, Bedi R. The association between dental anxiety and oral health-related quality of life in Britain. *Community Dent Oral Epidemiol.* 2004;32(1):67-72.
 19. Kirova DG, Atanasov DT, Lalabonova CK, Janevska S. Dental anxiety in adults in Bulgaria. *Folia Med (Plovdiv).* 2010;52(2):49-56.
 20. Bahammam MA, Hassan MH. Validity and reliability of an Arabic version of the modified dental anxiety scale in Saudi adults. *Saudi Med J.* 2014;35(11):1384-9.
 21. Almoznino G, Zini A, Sharav Y, Shahar A, Zlutzky H, Haviv Y, et al. Sleep quality in patients with dental anxiety. *J Psychiatr Res.* 2015;61:214-22.
 22. Egbor PE, Akpata O. An evaluation of the sociodemographic determinants of dental anxiety in patients scheduled for intra-alveolar extraction. *Libyan J Med.* 2014;9:25433.
 23. Schuurs AH, Hoogstraten J. Appraisal of dental anxiety and fear questionnaires: a review. *Community Dent Oral Epidemiol.* 1993;21(6):329-39.
 24. Haugejorden O, Klock KS. Avoidance of dental visits: the predictive validity of three dental anxiety scales. *Acta Odontol Scand.* 2000;58(6):255-9.
 25. Little JW. Anxiety disorders: dental implications. *General dentistry.* 2002;51(6):562-8.
 26. Armfield JM. Development and psychometric evaluation of the Index of Dental Anxiety and Fear (IDAF-4C+). *Psychol Assess.* 2010;22(2):279-87.
 27. Marya CM, Grover S, Jnaneshwar A, Pruthi N. Dental anxiety among patients visiting a dental institute in Faridabad, India. *West Indian Med J.* 2012;61(2):187-90.
 28. Locker D, Liddell AM. Correlates of dental anxiety among older adults. *J Dent Res.* 1991;70(3):198-203.
 29. Locker D, Liddell A, Burman D. Dental fear and anxiety in an older adult population. *Community Dent Oral Epidemiol.* 1991;19(2):120-4.
 30. Kanegane K, Penha SS, Borsatti MA, Rocha RG. [Dental anxiety in an emergency dental service]. *Rev Saude Publica.* 2003;37(6):786-92.
 31. Ekanayake L, Dharmawardena D. Dental anxiety in patients seeking care at the University Dental Hospital in Sri Lanka. *Community Dent Health.* 2003;20(2):112-6.
 32. Firat D, Tunc EP, Sar V. Dental anxiety among adults in Turkey. *J Contemp Dent Pract.* 2006;7(3):75-82.
 33. Al-Omari WM, Al-Omiri MK. Dental anxiety among university students and its correlation with their field of study. *J Appl Oral Sci.* 2009;17(3):199-203.
 34. Astrom AN, Skaret E, Haugejorden O. Dental anxiety and dental attendance among 25-year-olds in Norway: time trends from 1997 to 2007. *BMC Oral Health.* 11. England2011. p. 10.
 35. Appukuttan DP, Tadeipalli A, Cholan PK, Subramanian S, Vinayagavel M. Prevalence of dental anxiety among patients attending a dental educational institution in Chennai, India--a questionnaire based study. *Oral Health Dent Manag.* 2013;12(4):289-94.
 36. Armfield J. The avoidance and delaying of dental visits in Australia. *Aust Dent J.* 2012;57(2):243-7.
 37. Udoye CI, Oginni AO, Oginni FO. Dental anxiety among patients undergoing various dental treatments in a Nigerian teaching hospital. *J Contemp Dent Pract.* 2005;6(2):91-8.
 38. Quteish Taani DS. Dental anxiety and regularity of dental attendance in younger adults. *J Oral Rehabil.* 2002;29(6):604-8.
 39. Appukuttan D, Datchnamurthy M, Deborah SP, Hirudayaraj GJ, Tadeipalli A, Victor DJ. Reliability and validity of the Tamil version of Modified Dental Anxiety Scale. *J Oral Sci.* 2012;54(4):313-20.