

Original Article

Assessing dental anxiety in young girls in KSA

Abeer Al-Namankany, PhD

Paediatric Dentistry Department, Taibah University, Almadinah Almunawwarah, KSA

Received 16 September 2017; revised 20 November 2017; accepted 27 November 2017; Available online 22 December 2017



المخلص

أهداف البحث: تهدف الدراسة إلى تقييم العوامل المحتملة المسببة للقلق من زيارة طبيب الأسنان لدى الفتيات من عمر ٦-١٤ عاماً في المدينة المنورة، المملكة العربية السعودية.

طرق البحث: أجريت دراسة مقطعية على عينة عشوائية من فتيات المدارس أعمارهن بين ٦-١٤ عاماً. تم توثيق تصورات المشاركات باستخدام استبانة عيب لقياس قلق الأطفال من زيارة طبيب الأسنان.

النتائج: استجابت ١١٨ فتاة للدراسة، وأظهرت النتائج أن نسبة انتشار القلق كانت ٤٧.٦٪. وسجل خلع الأسنان السبب الأكثر شيوعاً للقلق من زيارة طبيب الأسنان (٦١.٨٪)، يليه الشعور بالخدر بعد وضع تخدير الأسنان (٨.١٧٪). لم تكن هناك علاقة بين القلق من زيارة طبيب الأسنان والمعرفة. وسجلت أعلى درجات القلق لدى الفتيات من ٧ إلى ٩ أعوام، من بينهن ٣٥.٦٪ (١١٨/٤٢) لم يقمن بزيارة طبيب الأسنان سابقاً. تم تسجيل علاقة سلبية بين درجات القلق من زيارة طبيب الأسنان والعمر مع قيمة ارتباط بيرسون -٠.٠٢٦.

الاستنتاجات: خلع الأسنان والتخدير وفقدان الإحساس أكثر العوامل شيوعاً للقلق من زيارة طبيب الأسنان وتخفض وتيرتها مع تقدم عمر الفتاة. ومع ذلك، تم تسجيل أعلى درجات القلق لدى الفتيات من ٧ إلى ٩ أعوام.

الكلمات المفتاحية: الأطفال؛ المعرفة؛ انتشار؛ الخوف؛ الفتيات

Abstract

Objective: To evaluate the potential causative factors of dental anxiety in girls aged 6–14 years in Almadinah Almunawwarah, KSA.

Methods: A cross-sectional study was conducted with a random sample of school girls aged 6–14 years. The

participants' perceptions were captured using the self-administered Abeer Children Dental Anxiety Scale.

Results: There were 118 respondents and the results showed 47.6% prevalence of dental anxiety. Dental extraction was reported as the most common cause for dental anxiety (18.6%), followed by the feeling of numbness after the application of dental anaesthesia (17.8%). There was no significant relationship between dental anxiety and cognition. The highest score of dental anxiety was found in children aged 7–9 years, of which 35.6% (42/118) had previously never visited a dentist. A negative correlation between dental anxiety scores and age was reported with a Pearson correlation coefficient of -0.026 .

Conclusions: Dental extraction, anaesthesia, and numbness were the most frequent causative factors of dental anxiety that appear to decrease in frequency as the child gets older. However, the highest score of dental anxiety was reported in 7- to 9-year-old girls.

Keywords: Anxiety; Children; Cognition; Fear; Girls; Prevalence

© 2017 The Author.

Production and hosting by Elsevier Ltd on behalf of Taibah University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Although the aetiology of dental anxiety in children is still not completely understood, it has been a subject of concern for countless researchers over numerous years¹. Anxiety is “a multi-system response to a supposed threat or danger; it comprises a combination of biochemical changes in the body and aspects of the patient's personal history, memory and

Corresponding address: Paediatric Dentistry Department, Taibah University, P.O. Box 41141, Almadinah Almunawwarah 38008, KSA.

E-mail: a.al-namankany@ucl.ac.uk

Peer review under responsibility of Taibah University.



Production and hosting by Elsevier

the social situation”.² “Dental anxiety is associated with symptoms that include at least four of the following: palpitations, sweating, trembling, shortness of breath, sense of choking, chest pain, nausea or other stomach upset, dizziness, a feeling of being detached from the world, being unable to think, fear of dying, numbness or tingling, cold or hot flushes, easily tired, trouble concentrating, irritability, muscle tension, restlessness, and sleep problems”.³

Dental anxiety is expected to start during childhood and increase over time in the absence of diagnosis and management.⁴ This anxiety is relatively common in the dental setting: “the British national children’s dental health survey found that the proportion of children who were dentally anxious steadily increased through the primary school years and then levelled off during the secondary school years to about 50% of the population”.⁵ “A study of eight European countries found that 35% of 5-year-olds and 21% of 12-year-olds were fearful before visiting the dentist,⁶ whereas 48% of children in Dubai were anxious even before visiting the dentist”.⁷ Most people feel that their dental fears began in childhood.⁸

The disturbing natures of some dental procedures could be considered as the supreme anxiety-provoking stimuli.⁹ A study in 2002 found that children with many carious lesions at the age of five years are likely to be dentally anxious at 10 years of age, probably because they have had pain and other negative treatment experiences.¹⁰ Dental anxiety is the basis of avoiding dental visits, as reported by numerous studies.¹¹ Furthermore, dental anxiety has been reported to decrease with repeated exposure to dental treatment, possibly due to habituation.¹²

Negative thoughts were associated with patients with dental anxiety; anxious and calm patients were found to differ dramatically on a sum of other cognitive reasons.¹³ Anxious patients are supposed to be less capable of continuing treatment plans that could help to reduce the anxiety during dental treatment; they expect “dental treatment to be more painful and more traumatic, they expect themselves to be more difficult to treat, and expect to be more nervous and helpless”.¹³ Several studies reported that dental anxiety is more prevalent in females than in males.^{7,14–19} Consequently, the objective of this study was to assess dental anxiety and the potential causative factors in a female population.

Materials and Methods

Ethical approval for the study was obtained from Taibah University, College of Dentistry Research Ethic Committee (TUCD-REC). A statistically calculated sample size of a dichotomous endpoint, one-sample study was used as the base sample of $n = 47$, with 80% power, 0.05 Alpha, 0.2 Beta, 60% population incidence, and 40% study group incidence. Increasing the sample size tends to reduce sampling error; therefore, a cross-sectional random sample of $n = 118$ of school girls aged 6–14 years was used. Written consent was obtained from the head teacher of the school who informed the parents and sent them the study information sheet in advance.

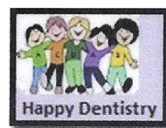
The inclusion criteria were belonging to classes I and II of the American Society of Anesthesiologists (ASA) Scale and being aged 6–14 years. Children with a learning disability or who did not meet the inclusion criteria were excluded.

Assessment of dental anxiety and the potential causative factors were completed by asking the participant children to report their dental anxiety on the Abeer Children Dental Anxiety Scale (ACDAS) that has been validated in more than one language; several studies suggest that the ACDAS is a valid, reliable, and clinically useful instrument for assessing dental anxiety in children.^{7,15,20} “ACDAS is a valid cognitive dental anxiety scale which could be used for children from age 6 years and over, it is made up of three parts; **Part A** is comprised of 13 self-reported questions, each question is marked on a 1 to 3 scale using three faces as a response set. Face ‘1’ represents the feeling of not scared ‘Happy’; face ‘2’ represents a neutral/fair feeling ‘OK’; and face ‘3’ represents the anxious feeling ‘Scared’. Each participant was asked to tick under the face that best represented the child’s response to the question. **Part B** is comprised of three self-reported questions that include the three main exposure questions of the cognitive assessment, each question is marked as (Yes) or (No)”.¹⁵ Children from different classes at the school were selected randomly and invited to report their anxiety independently on ACDAS (Figure 1). **Part C**, which comprised the parent’s and the dentist’s rating, was excluded from the study because it was not applicable at school and had no effect on dental anxiety total scores.

The primary outcome was to assess the potential causative factors of dental anxiety, whereas the secondary outcomes were to assess if there is a relationship between dental anxiety and cognition, and to assess if there is a relationship between dental anxiety and age.

Statistical analysis

Data were gathered and analysed using IBM-SPSS version 24. As a descriptive study, a histogram was drawn to show the age distribution of the participating children. The mean and the standard deviation (SD) were calculated for age. The frequencies and the percentages of the potential causative factors of dental anxiety were also evaluated. The total scores for the dental part of ACDAS ranged from 13 to 39. The cut-off point of ≥ 26 indicated anxiety; therefore, depending on whether the child’s answer was Happy, OK, or Scared, each answer was scored as 1; a total score of ≥ 26 for the 13 questions indicated that the child was anxious. As the age was normally distributed, parametric power tests were used. Categorical data were analysed using cross tabulation with chi-squared test; the significant level was set at $p \leq 0.05$ to assess the relationship between dental anxiety and the three main cognitive thoughts: “Do you feel shy at the dentist’s?” “Do you feel shy because of the look of your teeth?” “Are you worried about losing control at the dentist’s?”.¹⁵ Pearson correlation was used to assess the relationship between age and the numerical scores of dental anxiety.



Abeer Children Dental Anxiety Scale (ACDAS)

Date: _____ Child's age: _____ Gender: M / F Operator's name: _____

A. THE CHILD SELF-REPORT PART

I would like you please to tell me how relaxed or scared you feel at the dentist. Please use the scale below from 1 to 3, and tick (✓) under the face that shows us **how you feel now**.

1=Happy 2=OK 3=Scared

How do you feel about:	1 	2 	3
1. <i>Sitting in the waiting room?</i>			
2. <i>A dentist wearing a mask on his face?</i>			
3. <i>Laying flat on the dental chair?</i>			
4. <i>A dentist checking your teeth with a mirror?</i>			
5. <i>Having a strange taste in your mouth e.g. filling/gloves?</i>			
6. <i>Having a pinch feeling in your gum?</i>			
7. <i>The feeling of numbness (fat lip/tongue)?</i>			
8. <i>A dentist cleaning your teeth by buzzy electric arm that's spraying water?</i>			
9. <i>The sounds that you hear at the dentist?</i>			
10. <i>The smell at the dentist?</i>			
11. <i>Having a tooth taken out?</i>			
12. <i>Wearing a small rubbery mask on your nose to breathe special gas to help you feel comfortable during treatment?</i>			
13. <i>Having a pinch feeling on the back of your hand?</i>			

B. THE COGNITIVE PART

- For Child:** 14. Do you feel shy at the dentist? 1. Yes 2. No
 15. Do you feel shy because of the look of your teeth? 1. Yes 2. No
 16. Are you worried about losing control at the dentist? 1. Yes 2. No
- For Parents:** 17. Has your child had previous dental treatment? 1. Yes 2. No

18. How do you expect your child's behaviour today?

1. Happy 2. OK 3. Scared

For Operator: 19. At the end of this visit, what is your rating for the child's behaviour?

1. Happy 2. OK 3. Scared

Scale copyright © 2011 Dr.Abeer Al-Namankany.All rights reserved

Figure 1: Abeer Children Dental Anxiety Scale (ACDAS).

Results

A total of 118 out of 200 participants were included, while 82 students were excluded as they did not meet the inclusion

criteria (they were younger than 6 years). The age of the participating children was normally distributed. The minimum age was 6, the maximum was 14, the mean age was 8.45, and the SD was 2.13.

The prevalence of dental anxiety was 47.6%, children aged 7–9 years reported the highest score for dental anxiety. There was a negative correlation between age and dental anxiety scores. The number of anxious and not anxious girls based on age are reported in Table 1.

The Pearson correlation was -0.026 ; 51.7% of children (61/118) were shy at the dentist's, 49.2% (58/118) were shy because of the look of their teeth, and 66.9% (79/118) were worried about losing control at the dentist's. Although 64.4% of children (79/118) had previous dental treatment experience, 35.6% (42/118) had never previously visited a dentist.

Dental extraction was reported as the highest cause for dental anxiety (18.6%), followed by the feeling of numbness after the application of dental anaesthesia (17.8%), and 16.9% reported anxiety toward local anaesthesia. The percentage of 'anxious' responses reported by children on ACDAS is shown in Figure 2.

Table 1: Dental anxiety and age.

Age	ACDAS ≥ 26		Total
	Not anxious	Anxious	
6	13	14	27
7	6	12	18
8	4	17	21
9	7	13	20
10	5	9	14
11	3	4	7
12	1	2	3
13	2	2	4
14	1	3	4
118			

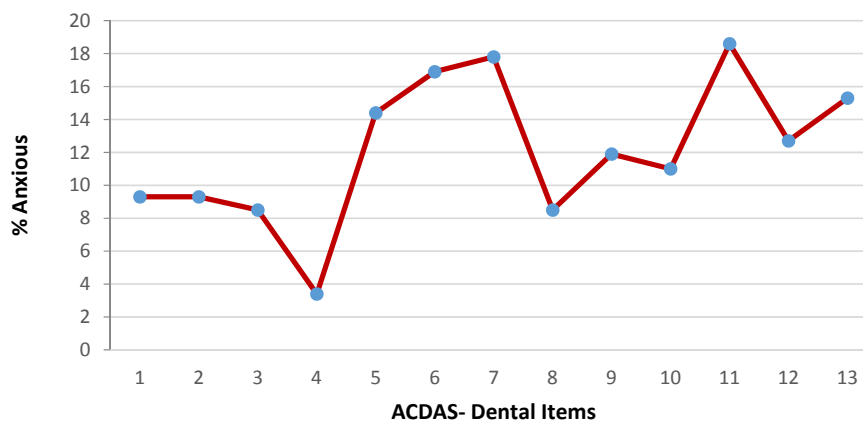


Figure 2: The percentage of the 'scared' responses on ACDAS.

Table 2: Dental anxiety and cognition.

	ACDAS ≥ 26	
	Not anxious	Anxious
(Q.14) Do you feel shy at the dentist's? ($P = 0.42$)	40%	60%
(Q.15) Do you feel shy because of the look of your teeth? ($P = 0.42$)	50%	50%
(Q.16) Are you worried about losing control at the dentist's? ($P = 0.26$)	35%	65%

The chi-squared test showed no significant relationship between dental anxiety (anxious/not anxious) and the children's cognition (yes/no). Results of the relationship of dental anxiety with whether children felt shy at the dentist's, and with whether they felt shy because of the look of their teeth were the same (Chi-square = 0.62, $df = 1$, $p = 0.42$). Results of the relationship between dental anxiety and whether children felt worried about losing control at the dentist's was also not significant (Chi-square = 1.29, $df = 1$, $p = 0.26$). The summary of these relationships is presented in Table 2.

Discussion

Studies of dental anxiety in children are more reliable than in mature people in terms of the investigation of the causes and the management of dental anxiety. This is as a result of the long intervening period between the onset of anxiety during childhood and these studies, which could limit the reliability and validity of dental anxiety studies in adults.²¹ Assessment of dental anxiety is the corner stone of the management of dental anxiety; therefore, the objective of this study was to assess the potential causative factors of dental anxiety in a sample of female students living in Almadinah Almunawwarah, KSA.

Different dental anxiety assessment tools were established in order to assist dentists to determine the prevalence of dental anxiety, which will be dependent on the question used to elicit its degree, and to provide improved services.²² The patient can report his/her anxiety on self-report scales.^{23,24} "the self-report scale is the most reliable measure for children who are able to read and have the cognitive ability to understand how to report their anxiety on the scale".²² The

age of children in this study was 6–14 years; hence, they had the cognitive ability to report their anxiety on ACDAS.

This is the first study in Almadinah Almunawwarah to assess dental anxiety; the prevalence of dental anxiety was 47.6%. A similar study conducted in Dubai found that the prevalence of child dental anxiety was 48%.⁷ “In the North-West of England, 8.1% of 5-year-old children were reported to be “fairly anxious” with a further 2.6% described as “very anxious”. In Italy, 15% of children aged 3–13 years were reported to be “afraid to some degree”, 7% were “fairly afraid”, and 5% were “very much afraid”. By contrast, in Finland, close to half of the children (44–55%) aged 3, 6, 9, 12, or 15 years were reported as “fearful of dental treatment in general or because of specified dental procedures”.²⁵

Despite industrial developments in present dentistry, anxiety related to dental visits is increasing around the world. It has been found to be 58.8% in Iran.²⁶ The highest score of dental anxiety in this study was reported in children aged 7–9 years, which is consistent with another study by Melamed.²⁷

A negative correlation between age and dental anxiety scores was found; it seemed that the increase in age was associated with a decrease in dental anxiety. Findings in this study supported the work of Popescu et al. (2014), which reported that anxiety tends to decrease as children get older.²⁸ The finding that 35.6% (42/118) of the children had never previously visited a dentist may suggest a lack of public knowledge of the importance of regular dental visits. More effort is required to educate and promote regular dental visits.

Cognitive restructuring can be an effective method to reduce the frequency of negative thinking and dental anxiety.²⁹ “The degree of belief in negative cognition is associated with the severity of dental anxiety”,³⁰ and “the negative thinking patterns of the anxious individual is centred on danger and harm”.³¹ However, there was no significant relationship between dental anxiety and the cognition of the participating children. It could be because the children were at school and not under the effect of the actual dental experience at the time when they reported their answers.

These results support the results of two other studies that found that anaesthetic injection and dental extraction were the most terrifying dental procedures.^{16,32}

One limitation of this study is that the sample included only females. It was not possible to include males because in KSA, it is not permitted for a female to visit a boys' school. More studies are required to evaluate the effect of cognition type on dental anxiety.

Conclusions

Dental extraction, anaesthesia, and numbness were the strongest causative factors of dental anxiety, which appear to decrease as the child gets older. However, the highest score of dental anxiety was reported in children aged 7–9 years.

Funding

This study was funded by Taibah University (6886).

Conflict of interest

The author has no conflict of interest to declare.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee of Taibah University, College of Dentistry Research Ethic Committee (TUCD-REC).

Informed consent

Informed consent was obtained from all individual participants included in the study.

References

1. Townend E, Dimigen G, Fung D. A clinical study of child dental anxiety. *Behav Res Ther* 2000; 38(1): 31–46.
2. Arslan S, Erta E, Ülker M. The relationship between dental fear and sociodemographic variables. *Erciyes Med J* 2011; 33: 295–300.
3. Seignourel PJ, Kunik ME, Snow L, Wilson N, Stanley M. Anxiety in dementia: a critical review. *Clin Psychol Rev* 2008; 28: 1071–1082.
4. Tickle M, Jones C, Buchannan K, Milsom K, Blinkhorn AS, Humphris GM. A prospective study of dental anxiety in a cohort of children followed from 5 to 9 years of age. *Int J Paediatr Dent* 2009; 19: 225–232.
5. Todd JE, Lader D. *Adult dental health 1988- report. Office of population censuses and surveys*. London: HMSO; 1991.
6. Bolin AK. Children's dental health in Europe. An epidemiological investigation of 5- and 12-year-old children from eight EU countries. *Swed Dent J Suppl* 1997; 122: 1–88.
7. Al-Namankany A, Ashley P, Petire A. Development of the first Arabic cognitive dental anxiety scale for children and young adults. *World J Meta Anal* 2014; 2(3): 64–70.
8. Berge MT, Veerkamp JS, Hoogstraten J. The etiology of childhood dental fear: the role of dental and conditioning experiences. *J Anxiety Disord* 2002; 16(3): 321–329.
9. Oosterink FM, de JA, Aartman IH. What are people afraid of during dental treatment? Anxiety-provoking capacity of 67 stimuli characteristic of the dental setting. *Eur J Oral Sci* 2008 Feb; 116(1): 44–51.
10. Raadal M, Strand GV, Amarante EC, Kvale G. Relationship between caries prevalence at 5 years of age and dental anxiety at 10. *Eur J Paediatr Dent* 2002; 3(1): 22–26.
11. Arnrup K, Broberg AG, Berggren U, Bodin L. Treatment outcome in subgroups of uncooperative child dental patients: an exploratory study. *Int J Paediatr Dent* 2003 Sep; 13(5): 304–319.
12. Brown L, Hammill D. *Behavior rating profile*. 2nd ed. 1990. Austin.
13. De Jongh A, Muris P, Ter Host G, Duxy M. Acquisition and maintenance of dental anxiety: the role of conditioning experiences and cognitive factors. *Behav Res Ther* 1995; 33(2): 205–210.
14. Mostofsky DI, Forgione AG. *Behavioral dentistry*. 1st ed. 2006. Blackwell.
15. Al-Namankany A, Ashley P, Fawcett C, Petire A. The development of a dental anxiety scale with a cognitive component for children and adolescents. *Paediatr Dent* 2012; 34(7): 219–224.
16. Al-Namankany A, Petrie A, Ashley P. Video modelling and reducing anxiety related to dental injections – a randomised clinical trial. *Br Dent J* 2014; 216(12): 675–679.
17. Al-Namankany A, Petrie A, Ashley P. Video modelling and acceptance of the nasal mask for inhalation sedation – a

- randomised clinical trial. *Eur Arch Paediatr Dent* 2015 Nov 7; 16(1): 13–18.
18. Al-Namankany A. *Dental phobia and anxiety: a guidance for a better management: non pharmacological behaviour management*. Book (Paperback), (2012) 08 June. 1st ed. LAMBERT; 2012.
 19. Saatchi M, Abtahi M, Mohammadi G, Mirdamadi M, Binandeh S. The prevalence of dental anxiety and fear in patients referred to Isfahan Dental School. *Iran. Dent Res J* 2015; 12(3): 248–253.
 20. Mafla AC, Villalobos FH, Fredy H, Pinchao R, Wilson M, Lucero DF. Psychometric properties of the Spanish version of the Abeer Children Dental Anxiety Scale (ACDAS) to dental anxiety in children. *Int J Odontostomat* 2017; 11(2): 182–191.
 21. Boman U, Lundgren J, Elfstrom M, Berggren U. Common use of fear survey schedule for assessment of dental fear among children and adults. *Int J Paediatr Dent* 2008; 18: 70–76.
 22. Al-Namankany A, de Souza M, Ashley P. Evidence-based dentistry: analysis of dental anxiety scales for children. *Br Dent J* 2012; 212(5): 219–222.
 23. Atkins Jr CO, Farrington FH. Informed consent and behavior management. *Va Dent J* 1994 Jan; 71(1): 16–20.
 24. McGrath PA. Measurement issues in research on dental fears and anxiety. *Anesth Prog* 1986 Jan; 33(1): 43–46.
 25. Nuttall NM, Gilbert A, Morris J. Children's dental anxiety in the United Kingdom in 2003. *J Dent* 2008; 36: 857–860.
 26. Saatchi M, Abtahi M, Mohammadi G, Mirdamadi M, Binandeh E. The prevalence of dental anxiety and fear in patients referred to Isfahan Dental School. *Iran Dent Res J* 2014; 12(3): 248–253.
 27. Melamed BG. Assessment and management strategies for the difficult pediatric dental patient. *Anesth Prog* 1986 Jul; 33(4): 197–200.
 28. Popescu S, Dascalu I, Scricciu M, Mercut V, oraru I, uculina M. Dental anxiety and its association with behavioral factors in children. *Curr Health Sci J* 2014; 40(4): 261–264.
 29. Al-Namankany A, Petrie A, Ashley P. Video modelling and acceptance of the nasal mask for inhalation sedation – a randomised clinical trial. *Eur Arch Paediatr Dent* 2014 Nov 7; 16(1): 13–18.
 30. De Jongh A. *Dental anxiety: a cognitive perspective*. PhD Thesis. Amsterdam: Academic Centre for Dentistry; 1995.
 31. Beck A, Rush J, Shaw B, Emery G. *Cognitive therapy of depression*. New York: The Guilford Press; 1979.
 32. Gaffar O, Alagl S, Al-Ansari A. The prevalence, causes, and relativity of dental anxiety in adult patients to irregular dental visits. *Saudi Med J* 2014; 35(6): 598–603.

How to cite this article: Al-Namankany A. Assessing dental anxiety in young girls in KSA. *J Taibah Univ Med Sc* 2018;13(2):123–128.