Original Article

Assessing dental anxiety in young girls in KSA

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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

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 years. 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...
the social situation”.

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 tyred, trouble concentrating, irritability, muscle tension, restlessness, and sleep problems.

Dental anxiety is expected to start during childhood and increase over time in the absence of diagnosis and management. 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”.

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, whereas 48% of children in Dubai were anxious even before visiting the dentist. Most people feel that their dental fears began in childhood.

The disturbing natures of some dental procedures could be considered as the supreme anxiety-provoking stimuli. 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. Dental anxiety is the basis of avoiding dental visits, as reported by numerous studies.

Furthermore, dental anxiety has been reported to decrease with repeated exposure to dental treatment, possibly due to habituation.

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. Several studies reported that dental anxiety is more prevalent in females than in males. 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. “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). 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 ≤ 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?” Pearson correlation was used to assess the relationship between age and the numerical scores of dental anxiety.
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.

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

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

### Table 1: Dental anxiety and age.

| Age | ACDAS ≥ 26 | Not anxious | Anxious | Total |
|-----|------------|-------------|---------|-------|
| 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 |            |             |         |       |

**Table 2: Dental anxiety and cognition.**

| Question | ACDAS ≥ 26 | Not anxious | Anxious |
|----------|------------|-------------|---------|
| Q.14     | (P = 0.42) | 40%         | 60%     |
| Q.15     | (P = 0.42) | 50%         | 50%     |
| Q.16     | (P = 0.26) | 35%         | 65%     |

![Figure 2: The percentage of the ‘scared’ responses on ACDAS.](image)
age of children in this study was 6–14 years; hence, they had the cognitive ability to report their anxiety on ACDDAS.

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%. 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”.

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. 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.

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. 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. “The degree of belief in negative cognition is associated with the severity of dental anxiety”, and “the negative thinking patterns of the anxious individual is centred on danger and harm”. 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.

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.

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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).

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