

Assessment of dental fear and anxiety among adolescent females in Riyadh, Saudi Arabia

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هذه الدراسة قيمت تواجدا القلق و الخوف من طبيب الأسنان ضمن عينة من الشابات السعوديات. جرى البحث على عينة بلغ مجموعها ١٤٢٤ طالبة، ٩١% منها سعوديات و الباقى (٩%) من دول عربية أخرى. استُخدم في هذه الدراسة استبيان يتضمن معيارا لقياس الخوف من طبيب الأسنان (DFS) و معيارا لقياس القلق من طبيب الأسنان (DAS) ووزعت على مجموع الشابات التي أُجريت عليهم الدراسة في ثلاثة مدارس حكومية في مدينة الرياض. أظهرت النتائج أن نسبة القلق و الخوف من طبيب الأسنان في العينة المأخوذة أعلى من تلك المعلنة في الدول الأخرى. ووجد القلق بنسبة عالية في ٢٩% من العينة، ووجد الخوف من طبيب الأسنان بنسبة ٢٥%. نسبة القلق و الخوف و جدا بمقدار أعلى في الشابات اللواتي أُجريت لهن عملية قلع سن في آخر زيارة لهن لطبيب الأسنان، ووجدت نسب عالية من الخوف و القلق في الشابات اللواتي زرن طبيب الأسنان مؤخرا. بينما أقل نسبة للخوف و القلق و جدا لدى الشابات اللواتي لم يزرن طبيب الأسنان أبداً. ووجد نسبة خوف و قلق منخفضة لدى الشابات اللواتي زرن طبيب الأسنان و أُجريت لهن عملية تنظيف أسنان فقط عند آخر زيارة. يمكن الاستنتاج بأن القلق و الخوف من طبيب الأسنان متواجدا بنسبة عالية ضمن الشابات اللواتي تعرضوا لتجربة سيئة لدى طبيب الأسنان.

This study assessed the current prevalence of dental anxiety and fear in a population of Saudi female adolescents. A sample size of 1424 students was used, of which 91% were Saudis and the rest other Arab nationalities. To assess anxiety and fear, a questionnaire was used. The questionnaires, incorporating the dental fear survey (DFS) and the dental anxiety scale (DAS), were distributed to adolescents in three public schools in Riyadh city. Overall, dental anxiety and fear were found to be considerably higher in the study group. High anxiety was found in 29% and high fear in 25% of the study subjects, respectively. The highest anxiety and fear levels were found in adolescents who had had an extraction at their last visit. Higher fear and anxiety levels were found in adolescents who had recently been to the dentist, while lower fear and anxiety levels were associated with adolescents who had never been to the dentist. The lowest fear and anxiety levels were related to oral prophylaxis. One may conclude that anxiety and fear are high among the subjects with previous traumatic dental exposure.

Introduction

Anxiety is defined as a state of uneasiness and distress about future uncertainties.¹ Fear is defined as a feeling of alarm or disquiet caused by the expectation of danger, pain, disaster or the like.¹ In one study, fear of the dentist has been ranked fourth among common fears.² Dental fear has been also reported as one of the most important reasons for avoidance and neglect of regular dental care.³ Neglect of dental care may lead to dental decay and pain that usually results in a visit to the dentist which in turn increases the patient's original dental fear and thereby completing a vicious circle.⁴ Non-anxious adolescents have been shown to have lower caries severity and lower caries incidence than adolescents who were dentally anxious.⁵ Anxious patients present problems not only to themselves but to their dentists as well, as they tend to be uncooperative during their visits, frequently cancel appointments, and due to their anxiety and fear develop a lower pain threshold.⁴ More time may be required for anxious patients than many dentists are willing to spend.⁶ These anxieties or fears usually result from direct experience and conditioning, or vicariously through information, such as that often provided by siblings or parents.⁴

It has been suggested that previous experience may serve to establish or maintain trust.⁷ Also a good dentist-patient relationship can help alleviate fear and instill trust in the dentist.

The Dental Fear Survey (DFS) and Corah's Dental Anxiety Scale (DAS) have been used as a measure of anxiety in many English speaking countries and cross-validated for other non-English speaking countries as well.⁸⁻¹⁴

The British National Children's Dental Health Survey of 1973 showed that the numbers of anxious children increased through primary school years and level off in the secondary school years to about 50% of the population.¹⁵ High dental anxiety was found in 7.1% of the population in Edinburgh, UK with dentally anxious individuals at four times the risk of needing immediate treatment than those who were not dentally anxious.¹⁶ The same population had a greater need for prosthodontic and periodontal treatment.

Findings in Norway indicated that dental anxiety was more common among young adults than among children.¹⁷ Young adult Danes experienced limited dental anxiety, judged on a global scale because of the positive effect of Denmark's Child Dental Health Service, which introduces dentistry to children at a young age.¹⁸

In Brazilian studies, high school students who had not seen the dentist recently but had reported

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undergoing a potentially painful procedure at their last dental visits were more likely to report high fear calculated at 16.1 % to 12.5% of the control group.¹⁹

In Singapore, high dental fear has been reported to be between 78-208 fearful young adults per 1000 population.¹³

Basically, low, moderate, and high fear levels among adolescents are similar to such levels among adults.²⁰ The difference between the two is that adolescents who have not visited the dentist within a year or more have higher fear levels than corresponding adults and generally, adolescents visit the dentist less than adults.²⁰

Limited studies are available concerning dental anxiety and fear in Saudi Arabia. A study done in Riyadh showed that 11.8% of the general population perceived dental treatment as stressful, 4.6% found dental treatment unpleasant and 6.2% find it painful, while 5.2% of the population avoided visiting the dentist for fear of pain.²¹ In a study of dental phobia among Saudis, it was found that in a sample of men and women over 25 years, half of the dental phobics said their fear began following a traumatic experience, while 45% said the fear began after seeing someone fearful and in pain in the dental clinic. Men and women stated that their fear began at age 17 and 15 respectively. Seventy per cent of women reported fear more often than men with greater severity.²²

The purpose of the present study was (a) to find out if there was a correlation between anxiety and fear with respect to potential or real dental treatment, (b) to find out if there was a relationship between anxiety and fear and the length of time since the last dental visit and the nature of the last dental visit, and (c) to find out the percentages of anxious and fearful adolescents and their range of anxiety and fear, and compare these figures to worldwide results.

Materials and Methods

The study population consisted of 1700 female high school students aged 13-19 years, in grades eight to twelve of three public schools in Riyadh city. A convenient sample was chosen based on location of the schools and cooperation of the administration to be included in the study. The questionnaires were distributed to the students through the school authorities. The first part of the survey contained inquiries about age, grade, previous and frequency of visits to the dentist. Questions regarding previous exposure to lectures

about oral health and treatment in school and the nature of the last visit to the dentist were also included. Two measures were used to assess dental fear and anxiety, namely the Dental Fear Survey (DFS) and the Dental Anxiety Scale (DAS), which have been translated into Arabic by the investigator, and validated by a psychologist and linguist to ensure that the questionnaires convey the same meaning as the original English questionnaires. The DAS is a questionnaire containing four situations regarding going to the dentist, waiting in the operatory, waiting while the dentist gets his handpiece ready, and waiting for the dentist to get the instruments to clean the teeth. The answers range were "relaxed", "uneasy", "tense", "anxious", "so anxious that I get physically ill". Answers were scored on a scale of 1-5, and summed to give an overall scale of 20. Low anxiety was considered a score below the 25th percentile (below 7), while moderate anxiety was between the 25th and 75th percentile (between 7-14), high anxiety was scored above the 75th percentile (above 15). The DFS is a 20-question form, with questions on various steps in the dental experience like making an appointment, seeing the dentist enter and feeling the drill in your mouth. The answers range from 'not at all fearful' (20) to 'very much afraid' (100). Low fear was measured below the 25th percentile (below 33), moderate fear between the 25th and the 75th percentile (34-58), and high fear above the 75th percentile (above 59).

The questionnaires were pre-tested to ensure the understanding of the questionnaire by the target student sample, the ease of answering the questions and the time needed to fill out the questionnaire. Each school was visited only once, and all students present in their classes that day were included in the survey. Statistical analysis used in this study was used to describe the data, Pearsons test to find the correlation between anxiety and fear, and the Chi-Square test was used to find the relationship between anxiety and fear with time-lapse since last visit and treatment at last visit.

Results

The final number of questionnaires used in the analysis was 1424 (83.8%), 1605 questionnaires corresponding to 94.4% were returned of which 181 were discarded due to incomplete data on the questionnaires. The respondents were 91% Saudi nationals and the rest other nationalities. The

mean age of the adolescents in the sample was 16 years (SD= 1.64), with an age range of 13-19 years.

Sixteen per cent of the students presented low anxiety, 54.5% moderate anxiety, and 29.0% of the students reported high anxiety (Table 1). Low fear was reported by 21.8% of the students, moderate fear by 53%, and 25% of the students reported high fear (Table 1).

Table 1. Number and percentage of students reporting anxiety and fear.

Anxiety			Fear		
Low	Moderate	High	Low	Moderate	High
233	776	415	311	756	357
16.4%	54.4%	29%	21.8%	53%	25%

Table 2. Number and percentage of anxious and fearful students according to time lapse since last dental visit.

	Total	Anxiety			Fear		
		Low	Moderate	High	Low	M o d e r a t e	High
High							
Never	118	17	58	43	32	60	26
22%	14.4%	49.2%	36.4%	27.2%	50.8%		
6m-1 year	738	136	416	186	177	389	172
23.3%	18.4%	56.4%	25.2%	24%	52.7%		
1-2 years	271	34	149	88	44	150	77
28.4%	12.5%	55%	32.5%	16.2%	55.4%		
> 2 years	46	153	98	58	157	82	

There was a high positive correlation between anxiety and fear ($r=0.628$). Surprisingly, only 118 (8.3%) of the respondents had never visited the dentist before. Of these respondents 14.4% reported low anxiety, 49.2% moderate anxiety, and 36.4% reported high anxiety. In regards to fear, 27.2% reported low fear, 50.8% moderate fear, and 22% high fear (Table 2) Slightly over half of the students, 738 (51.8%) had been to the dentist within the previous six months to one year, of these 18.4% reported low anxiety, 56.4% moderate anxiety, and 25.2% reported high anxiety. In regards to fear, 24% reported low fear, 52.7% moderate fear, and 23.3% high fear (Table 2). Only 271 (19%) of the respondents had been to the dentist within the previous 1-2 years, of these 12.5% reported low anxiety, 55% moderate anxiety, and 32.5% reported high anxiety. In regards to fear, 16.2% reported low fear, 55.4% moderate fear, and 28.4% reported high fear (Table 2).

and 32.5% reported high anxiety. In regards to fear 16.2% reported low fear, 55.4% moderate fear, and 28.4% high fear (Table 2). Approximately, 297 (20.8%) of the adolescents had not been to the dentist in over two years. Of these 15.5% reported low anxiety, 51.5% moderate anxiety, and 33% reported high anxiety. In regards to fear, 19.5% reported low fear, 52.9% moderate fear, and 27.6% high fear (Table 2). Although there was a significant difference between anxiety and the time lapse since the last visit ($p=0.002047$), there was no significant differences in fear levels.

Table 3. Number and percentage of anxious and fearful students according to the last dental treatment.

	Anxiety			Fear		
	Low	Moderate	High	Low	M o d e r a t e	High
High						
Check-up	48	154	37	57	128	48
21.5%	20%	64.5%	15.5%	25.6%	57.7%	14.4%
Filling	38	104	54	54	100	48
23.7%	19.4%	53%	27.5%	26.6%	49.3%	24%
Endo	84	303	171	114	285	142*
21.4%	15%	54.3%	30.7%	17.1%	42.9%	40%
Prophy	23	46	21	34	46	20
25.5%	25.5%	51.1%	23.4%	34%	46%	20%
Ortho	14	60	46	34	57	36
28.3%	11.7%	50%	38.3%	26.8%	44.9%	28.3%
Extraction	36	140	117	43	142	93
33.5%	12.3%	47.7%	40%	15.5%	51.1%	33.5%
Other	7	21	11	11	19	9

Different specific dental treatments appeared to elicit variable levels of anxiety and fear (Table 3). Results show that there are highly significant differences in anxiety and fear levels among adolescents subjected to different treatment procedures at their last dental visit ($p=0.0000006$ and $p=0.003891$, respectively). The highest reported anxiety and fear levels were among adolescents who had an extraction at their last dental visit (40% and 33.5%). The lowest reported anxiety and fear levels were among adolescents who had a prophylaxis at their last dental visit (25.5% and 34%).

Discussion

The relationship between anxiety and fear is not a perfect one indicating that there is a distinction between anxiety and fear. However, The high positive correlation between anxiety and fear may be due to the interchangeable use of words by patients (and dentists).

This study found higher reports of fear and anxiety in Saudi female adolescents than in other nationalities. Saudi female adolescents showed 21.9% higher anxiety than their counterparts in Edinburgh, UK.¹⁶ They showed 8.9% higher fear than Brazilian adolescents,¹⁹ and 4.2- 18% higher fear than Singaporean young adults.¹³ This may be due to the exclusive inclusion of females in this study chosen because schools are segregated by gender at age 6 in the Kingdom of Saudi Arabia. Studies have shown that females worldwide tend to report higher percentages of anxiety and fear.²³ These observations most likely may be due to real differences in anxiety levels between genders, a greater readiness among females to acknowledge feelings of anxiety to perhaps both factors acting in combination.^{22,23} Another factor may be that younger people have been shown to be more anxious than older people.²³

There were a significantly higher percentage of reports of high anxiety among adolescents who had never been to the dentist. On the other hand, the lowest level of fear was reported by adolescents who had never been to the dentist. This confirms the distinction between anxiety and fear. It illustrates that although students who had never been to the dentist may not actually fear the dentist, they might have an uneasiness regarding their dental visit.

Anxiety and fear were found to be significantly higher in adolescents who had dental extraction at their last dental visit (40% and 33.5%). Invasive procedures such as an extraction can cause trauma to the adolescent thereby creating a recurring fear of the dentist. Procedures that elicit high fear should be avoided by the prevention of their occurrence. This can be achieved by education on oral hygiene instruction and motivation. Students who had never been to the dentist reported low levels of fear. This might be because these adolescents at that time had no preconceived notion of dental treatment, and do not assume dental treatment to be fearful. These groups of students require sustained positive motivation and dentist/patient relationship. This might be reinforced by a non-threatening procedure such as an oral prophylaxis, which elicited the lowest

levels of anxiety and fear (25.5% and 34% respectively). It is important to educate and motivate these patients at this stage of life, if not before. It has been reported that the introduction of dental care to children at a younger age as a common normal health care event is associated with limited anxiety in young adults.¹⁸ Since most Saudis reported dental fear beginning at age 15, it seems likely that they had encountered a bad experience at this time due perhaps to their never having visited the dentist as a child before, and were subjected to a traumatic experience at their first encounter with dental treatment at this late age of 15 years.

Conclusion

This study showed that:

1. There is a high prevalence of fear and anxiety in female Saudi adolescents (25-27%) in respect of clinical dental procedures.
2. Invasive procedures should be avoided as much as possible or until the doctor/patient rapport and trust are developed.
3. Saudi adolescent females that have never been to the dentist, do not appear to have preset notions of fear of dental treatment.
4. Alternating fear and anxiety associated with dental care procedures in these young Saudi (and non-Saudi) adolescents may reduce the number of fearful and anxious adults in future.

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