



# PREVALENCE OF DENTAL ANXIETY AMONG SAUDI POPULATION IN BURAIYDAH

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*Authors declare no conflict of interest*

## Abstract

**Purpose:** Dental anxiety remains a barrier to dental treatment for many individuals. This study aimed to measure the prevalence of dental fear and anxiety among Saudi citizens in Buriydah, Qassim.

**Methods:** Data collected through a questionnaire-based cross-sectional survey conducted in different areas of Buriydah (n=1037; 41.1% males, 58.9% females). The first part of the questionnaire consisted of scoring of the Dental Anxiety Scale, Revised (DAS-R) based on Norman Corah's dental questionnaire, and the second part containing dental concerns assessment to scale the anxiety over different dental procedures.

**Results:** The study revealed that the mean DAS-R score for study population was  $10.16 \pm 3.1$  with statistically significant difference between males and females, as well as age groups and education level ( $p < 0.05$ ). The dental concerns assessment showed wide variation regarding degree of fear for different dental procedures. The highest percentage of fear was reported for teeth extraction (54.2%) and the lowest for X-ray taking (8.2%).

**Conclusion:** Females and young adults were found to have higher dental anxiety scores and were more likely to have higher dental fear for some clinical procedures.

**Key words:** Avoidance, Dental fear, Dental anxiety, Odontophobia, Prevalence

## Introduction

Despite the technological advances made in modern dentistry, anxiety about dental treatment and fear of pain associated with it remain widespread (1). Dental anxiety denotes a state of apprehension that something dreadful is going to happen in relation to dental treatment, and it is often coupled with a sense of losing control (2). Dental fear and anxiety (DFA) are characterized by essential and inevitable emotion that appears as a response to various dental procedures (3). It varies in intensity from one patient to another, ranging from a simple nervousness to dental anxiety, which is

a sentiment of fear often unjustified and can disappear spontaneously or amplify, thus defining dental phobia (3).

Dental anxiety and phobia can also be distinguished by looking at the quantity or intensity of the anxiety experience and the patient's capacity to cope with it. Patients who have dental anxiety can cope with the intensity of their anxiety and receive dental treatment. However, patients who have dental phobia cannot cope with the intensity of their anxiety and thus avoid treatment (4). Dental phobia is a particular form of fear, completely disproportionate to reality, which cannot be explained or voluntarily controlled; if it persists, it can in time induce permanent avoidance of provocative situations (3).

The most frequent causes of dental fear include: fear of pain by anticipation, of being deceived/betrayed, of losing control, fear of the unknown (through lack of information or communication), of invasive procedures, of a psychological aggression (scolding/criticizing), fear of repetition of negative past experiences, of the various dental instruments' noises, of bleeding, of the unpleasant smells associated with the dental practice, fear of meeting unfriendly medical staff, and of being confined in small places (5). Moreover, studies have revealed that dental fear is a result of negative experiences of dental visits, and that dental fear and anxiety develop in childhood (6), but some studies have suggested that 30–50% of dental fear begins in adolescence or adulthood (6, 7).

Generally, the etiology of dental fear is multifactorial. The exogenous origin of dental fear can be seen as acquisition of fear as a function of direct or vicarious experiences. These experiences might not be the causes of the fear, but they might also be responsible for the development of fear among patients who have endogenous vulnerability to anxiety disorders and multiple fears (8). Development of fear can be seen as a continuum, at one end of the continuum requiring no learning and at the other end requiring a great deal of learning (9). Assessment of dental fear provides information on this psychological construct, which has been shown to predict dental attendance and to affect oral health (10). Numerous measures have been developed for identifying dentally anxious people and for assessing their level of dental fear (11-19).

Daily dental practice is often accompanied by stress, as dentists are restrained by a limited period of time for

Score	Dental Anxiety
9-12	Moderate anxiety but have specific stressors that should be discussed and managed
13-14	High anxiety
15-20	Severe anxiety (or phobia). May be manageable with the Dental Concerns Assessment but might require the help of a mental health therapist.

Table 1. Scoring of Dental Anxiety Scale, Revised (DAS-R)

individual treatment, accurate diagnosis, pain and discomfort caused by dental diseases, patients being late or missing an appointment as well as communication problems when dealing with difficult patients (20). Dental fear in children has been recognized as a problem in patient management for many years. The effects of this fear have been shown to persist into adulthood, which can lead to dental avoidance (1). Dental avoidance in turn eventually may result in poorer oral health (21).

High dental anxiety has been associated with poor dental health measured as the numbers of decayed, filled or missing teeth. Greater numbers of decayed teeth are found among people with high dental fear compared to people with low dental fear (22, 23). Some studies showed an association between dental fear and subjective oral impacts and quality of life. In a community study made in Hong Kong, those with high dental fear were more likely to report subjective oral impacts than those with lower dental fear (23). In addition, in two studies that included patients at a dental clinic, those with higher dental anxiety more often reported subjective oral impacts than those with lower anxiety (24, 25).

The aim of this study was to measure the prevalence of dental fear and anxiety among Saudi citizens in Buriyah, Qassim.

## Materials and methods:

A cross-sectional study through a questionnaire-based survey was conducted among a sample Saudi people living in Buriyah, Qassim Province.

### I. Study Settings:

Ethical approval for carrying out the present cross sectional survey was obtained from the dental research center, college of dentistry, Qassim University.

The study area is Buriyah, capital of Qassim Province, 1290 sq. km with population 467,410. The target population for the present study comprised individuals aged 16- 65 years living in Buriyah. The inclusion criteria specified that individuals had to be

aged 16 - 65 years. Subjects who were uncooperative and those who filled incomplete questionnaires were excluded. The sample selected accounted for 1,300 individuals, among whom 1,037 participated in the study.

### II. Questionnaire:

The purpose of the study was explained to each participant, and information was retrieved using a questionnaire. The questionnaire consisted of three parts: the first part was composed of items on demographic data: nationality, age, gender, and education level. The second part included the Norman Corah's Dental Questionnaire (11). It is a four-item questionnaire that asks respondents to indicate their emotional reactions anticipating dental visit, in the waiting room, anticipating drilling, and anticipating scaling. Each question has five response alternatives. According to the individual's choice, a = 1, b = 2, c = 3, d = 4, e = 5, which e=5 correspond as the highest score and a=1 as the lowest score. The total score is calculated (Total possible = 20) to rate the Dental Anxiety Scale, Revised (DAS-R) (Table 1). The third part contains Dental Concerns Assessment (26), which scales concerns or anxiety over a list of dental procedures.

The questionnaire was written in English and translated into the local language, Arabic. It was then back-translated to English and found to be valid.

### III. Data Collection Method:

Approvals for data collection were obtained from authorities of selected locations. Individuals were approached in both public and private dental clinics, as well as malls and secondary schools. The purpose of the study was explained to each participant. Individuals were not under obligation to participate in the study. The questionnaires were distributed and collected back again after being completed. The questionnaires were distributed during the period from September to November 2011.



	Male (n=426)	Female (n=611)	Total (n= 1037)
Mean DAS-R	9.75 ±3.251	10.45±2.956	10.16 ± 3.1
	$t= 3.533, p<0.001 *$		

**Table 3. Relation between DAS-R and Gender**

\* Statistically significant at  $p \leq 0.05$

t: for independent t-test

#### IV. Statistical Analysis:

Collected Data was analyzed using the Statistical Program for Social Sciences (SPSS) version 19. Serial numbers (1-1037) were given for each questionnaire sheet. The questions were given variable names from Q1 to Q4 for part 2 and (1- 24) for questions of the third part of the questionnaire. Then the choices in each question got a numeric value relevant to the corresponding answer of each participant.

Descriptive statistics were performed using frequency count and percentages. T-test, ANOVA and Chi square tests were performed to determine the difference between the study groups at the 5% level of significance.

### Results

The survey was conducted with an overall response rate of 79.8%, in which out of the total 1300 distributed questionnaire 1037 questionnaire returned back. Table 2 shows the socio-demographic and background characteristics of the study population.

Mean DAS-R for study population:

Table 3 shows moderate dental anxiety of the study population who had a mean DAS-R of  $10.16 \pm 3.1$ ; a significant difference between males ( $9.75 \pm 3.251$ ) and females ( $10.45 \pm 2.956$ ) at  $p \leq 0.001$  was found, which shows females suffered from more dental anxiety.

Regarding age groups, (Table 4) the mean DAS-R showed statistically significant differences between (16y-20y) and (20y -40y) age groups ( $p = 0.017$ ), as well as between (16y-20y) and (40y -60y) age groups ( $p = 0.014$ ). No statistically significant differences were found between the other groups ( $p > 0.05$ ).

Concerning the level of education, Table 5 shows statistically significant differences between the mean DAS-R of subjects with postgraduate education and the mean DAS-R of all other groups except whom holding Bachelor's degree.

Dental Concerns Assessment:

Table 6 shows the percentage of high fear action for different dental procedures. Teeth extraction was the most frequent dental procedure causing high fear (58.05%). Root canal treatment was the second frequent procedure causing high fear followed by injection of anesthesia (51.98% and 39.44%, respectively). Rubber

dam application and x-ray taking were the lowest frequent procedures to give high fear (9.35% and 8.2%, respectively).

Table 7 shows the relation between gender and fear of different dental procedures. A statistically significant difference was found between males and females regarding their fear of anesthesia injections; 43.4% of females showed high fear of injection, while only 33.8% of males had high fear of injections ( $p = 0.015$ ). In addition, there was a significant difference for vomiting during impression taking as 15.3% of males were highly afraid of vomiting and 41.1% had low fear, while 19.5% of females had high fear from vomiting during impression taking and 33.1% had low fear ( $p = 0.034$ ). The fear of x-ray taking also showed a significant difference between males and females; 9.6% of males had high fear, while only 7% of females had the same feeling ( $p = 0.005$ ). Moreover, The fear of root canal treatment showed a significant difference between males and females; a higher percentage of root canal fear was found in females (53.5% high fear), while 44.8% of males had a high fear of root canal treatment ( $p = 0.046$ ).

Table 8 shows the relation between age groups and fear of different dental procedures. The difference was statistically significance in anesthesia feeling ( $p = 0.001$ ); 40.1% of the younger age group (16-20 years) had low fear of this procedure, unlike (20-40y), (40-60y) and (more than 60 y) age groups that 35%, 25.1% and 26.3% of them had low fear for this procedure, respectively. A statistically significant difference was found between age groups regarding the fear of anesthesia injections ( $p = 0.001$ ), the highest percentage of high fear was for (40-60y) age group (51.5%). The fear of x-ray taking showed a significant difference between age groups ( $p = 0.013$ ); the highest percent for high fear was among the elderly subjects (more than 60 years) (15.8%), and both (16-20y) and (20-40y) age groups were highly afraid of this procedure (9.4%). Fear from cold air showed a statistically significant difference; 41.5% of (40-60y) age group, 35.3% of (20-40y) group, 31.6% of (more than 60 y) group, and 28.1% of (16-20y) group were highly afraid of the pain from Air Syringe. Most subjects of all age groups showed high fear of root canal treatment with a significant difference ( $p = 0.016$ ) between them as 55.8%, 49.1%, 55% and 57.9 % of high fear were reported in (16-20y), (20-40y), (40-60y), and (more than 60) age groups, respectively. The

	Age Groups				F (p)
	16 -20 y	20-40 y	40-60 y	More than 60	
<b>DAS-R</b> Mean ± SD	10.72 ±3.366	10.03 ± 3.086	9.78 ± 3.167	9.95 ± 3.291	3.92 (0.008)*
<b>R1(p)</b>		0.017*	0.014*	0.736	
<b>R2(p)</b>			0.814	1.000	
<b>R3 (p)</b>				0.997	

**Table 4. Relation between Age groups and DAS-R Score**

\* Statistically significant at  $p \leq 0.05$ ; F: for ANOVA Test; R1: Post Hoc Turkey HSD test between 16-20 y and other age groups.; R2: Post Hoc Turkey HSD test between 20-40 y and other groups; R3: Post Hoc Turkey HSD test between 40-60 y and other groups

(40-60y) age group showed the highest percent of fear from multiple visits to the dentist (43.9%) in comparison to the other groups ( $p = 0.030$ ). A significant difference between age groups was found regarding the fear of the cost ( $p < 0.001$ ), as 57.9% of (more than 60y), 47.4% of (40-60 y), 33.4% of (20-40y), and 14.2% of (16-20y) age groups had high fear of dental treatment cost. Being shy from the personal oral hygiene status was statistically differed between the age groups, 50.2% of (16-20y) and 46.4% of (20-40y) age groups had a low fear, while 30.4% of (40-60y) and 15.8% of (more than 60y) age groups had high fear of being shy from their own personal oral hygiene status.

## Discussion:

Dental fear is commonly suggested to be multifactorial and multidimensional, consisting of behavioral, physiological, and cognitive components (27, 28). It is a unique fear in comparison to other specific fears because it has a stronger component of bodily injury than many other fears. The oral region is a very sensitive area and includes more receptors of somatic sensation than any other part of the human body (29). This study measured the prevalence of dental fear and anxiety among Saudi citizens in Buriyadah, Qassim, through questionnaire-based survey conducted in different areas of Buriyadah.

Gender differences in dental fear are controversial. In the present study there was a statistically significant difference between males and females in DAS-R, like several studies that have reported similar findings (2, 30, 31). On the other hand, some studies have found no gender differences in dental fear (32, 33).

The results revealed that the younger age groups have a significant more fear with no significant gender effect has been found, which is in line with the study of Neverlien in 1994 (34). On the other hand, a longitudinal birth cohort up to the age of 26 years showed that one third of the

study subjects first experienced dental anxiety during childhood or early adolescence, one third during late adolescence, and one third during early adulthood (35).

The relationship between sensitivity to pain and fear of pain has been shown to be associated with dental anxiety (36, 37). In the current study, 58.05% of the sample population had high fear from teeth extraction, and 52.98% from root canal treatment which thought by many as the most painful dental procedures. A previous study showed that adults who expected more pain before restorative treatment were more anxious than adults who expected less pain, and anxious subjects also experienced more pain during treatment than non-anxious subjects did. In addition, adults who are sensitive to anxiety have been suggested to be prone to exaggerate their expectations of pain (37).

The study also showed other characteristic of dental anxiety that was not in general reported in the literature. Almost half of the sample (39.44%) was afraid of anesthesia injection. A statistically significant difference was found between males and females with the females showing a higher degree of fear (43.4%) compared to males (33.8%), which is in accordance with previous studies (15, 30).

Patients should be encouraged to ask their questions during the first appointment. As 18.8% of the sample have high fear from asking the dentist their questions. Patients should not embarrass or be judged as other study illustrated that embarrassment is a complex dental anxiety manifestation showing clinical differences by complaint characteristics and perceived intensity (37).

Although the avoidance of the dentist is a well-known finding associated with severe dental anxiety, this study did not show a correlation between the frequency of visits to the dentist and severity of dental anxiety. However, this study showed that 33.2% of the sample population has high fear of going to the dentist because it might result in several visits.



	Levels of Education					F (p)
	Read & Write	Basic	Secondary	Bachelor's	Postgraduate	
<b>DAS-R</b> Mean ± SD	10.56 ± 3.636	10.56 ± 3.115	10.52 ± 3.218	9.96 ± 3.112	8.91 ± 3.315	3.92 (0.008)*
<b>R1(p)</b>		1	1	0.825	0.008*	
<b>R2(p)</b>			1	0.229	0.008*	
<b>R3 (p)</b>				0.129	0.005*	
<b>R4 (p)</b>					0.129	

**Table 5. Relation between Level of Education and DAS-R Score**

\* Statistically significant at  $p \leq 0.05$

F: for ANOVA Test; R1: p for Post Hoc Turkey HSD test between read & write and other groups; R2: p for Post Hoc Turkey HSD test between basic education and other groups; R3: p for Post Hoc Turkey HSD test between secondary education and other groups; R4: p for Post Hoc Turkey HSD test between bachelor's education and other groups

## Conclusion

Generally, the Saudi population in Buriyadah has a moderate dental fear with significantly higher dental anxiety scores among females. Also, it was found that young adults had a higher dental anxiety scores and were more likely to have higher dental fear for some clinical procedures. Extraction and Root canal treatment were the dental procedure with higher dental fear among Saudi population in Buriyadah. Painful irritants and confidence in dentist are the most significant factors behind the dental fear.

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	No. (N=1037)	%
<b>Gender</b>		
Male	426	41.1%
Female	611	58.9%
<b>Age</b>		
16 - 20 y	267	25.7%
20-40y	580	55.9%
40-60	171	16.5%
more than 60	19	1.8%
<b>Education</b>		
Read & Write	34	3.3%
Basic	156	15.0%
Secondary	279	26.9%
Bachelor's	512	49.4%
Postgraduate	56	5.4%

**Table 2. Distribution of studied cases according to demographic data**

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Procedure	No.	%
Extraction	602	58.05%
RCT	539	51.98%
Injection	409	39.44%
Injury	392	37.80%
Pain from air syringe	357	34.43%
Multiple –visit	344	33.17%
Not anaesthetized	343	33.08%
Handpiece	325	31.34%
Cost	324	31.24%
Anesthesia Feeling	276	26.62%
Scaling	273	26.33%
OH status	244	23.53%
Clinic- Odor	230	22.18%
Treatment Needs	229	22.08%
No given enough info	228	21.99%
Can't Ask	195	18.80%
Vomiting-Impression	185	17.84%
Mouth Fatigue	173	16.68%
Not Serious	163	15.72%
Criticism	159	15.33%
Gingival _Examination	152	14.66%
Panic attack	143	13.79%
Rubber Dam	97	9.35%
X-ray	85	8.20%

**Table 6. Percentage of high fear for different dental procedures (Descending)**

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Table 7. Relation between Gender and fear of different dental procedures

Not serious	Low	190	44.6%	250	40.9%	440	42.4%
	Moderate	111	26.1%	153	25.0%	264	25.5%
	High	69	16.2%	94	15.4%	163	15.7%
	No/ Don't know	56	13.1%	114	18.7%	170	16.4%
	<b><math>\chi^2= 5.663</math> , <math>p= 0.129</math></b>						
Criticism	Low	187	43.9%	243	39.8%	430	41.5%
	Moderate	93	21.8%	121	19.8%	214	20.6%
	High	72	16.9%	114	18.7%	186	17.9%
	No/ Don't know	74	17.4%	133	21.8%	207	20.0%
	<b><math>\chi^2= 4.393</math> , <math>p= 0.222</math></b>						
Treatment Needs	Low	154	36.2%	222	36.3%	376	36.3%
	Moderate	127	29.8%	177	29.0%	304	29.3%
	High	97	22.8%	132	21.6%	229	22.1%
	No/ Don't know	48	11.3%	80	13.1%	128	12.3%
	<b><math>\chi^2= 0.896</math> , <math>p= 0.827</math></b>						
Multiple visits	Low	133	31.2%	196	32.1%	329	31.7%
	Moderate	105	24.6%	167	27.3%	272	26.2%
	High	151	35.4%	193	31.6%	344	33.2%
	No/ Don't know	37	8.7%	55	9.0%	92	8.9%
	<b><math>\chi^2= 1.903</math> , <math>p= 0.593</math></b>						
Clinic- Odor	Low	189	44.4%	276	45.2%	465	44.8%
	Moderate	106	24.9%	138	22.6%	244	23.5%
	High	93	21.8%	137	22.4%	230	22.2%
	No/ Don't know	38	8.9%	60	9.8%	98	9.5%
	<b><math>\chi^2=0.8536</math> , <math>p= 0.837</math></b>						
Cost	Low	161	37.8%	233	38.1%	394	38.0%
	Moderate	88	20.7%	145	23.7%	233	22.5%
	High	146	34.3%	178	29.1%	324	31.2%
	No/ Don't know	31	7.3%	55	9.0%	86	8.3%
	<b><math>\chi^2= 4.086</math> , <math>p= 0.252</math></b>						
OH-Status	Low	188	44.1%	284	46.5%	472	45.5%
	Moderate	103	24.2%	138	22.6%	241	23.2%
	High	106	24.9%	138	22.6%	244	23.5%
	No/ Don't know	29	6.8%	51	8.3%	80	7.7%
	<b><math>\chi^2=1.912</math> , <math>p=0.591</math></b>						

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