

ORIGINAL ARTICLE

# Dental anxiety & phobia: prevalence and most frequent causes among dentists and public in Saudi Arabia

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## ABSTRACT

**Background:** Dental fear (DF) is a normal emotional reaction to one or more specific threatening stimuli within the dental situation. Dental phobia represents a severe type of dental anxiety (DA) and is characterized by persistent anxiety in relation to either discernible situations/objects (e.g., drilling and injections) or dental situations in general. This study aimed to evaluate the prevalence of DF and anxiety and the most common causes of dental phobia among the public.

**Methodology:** A cross-sectional descriptive survey, based on a structured questionnaire, conducted in hospitals, malls, and dental clinics. Social media outlets were also used to collect the responses. The questionnaire also included demographic features, such as age, gender, and specialty. The collected data were statistically analyzed with descriptive statistics and Pearson chi-square test ( $p < 0.05$ ), using SPSS Version 23.

**Results:** The study included 456 participants; the age of the participants varied from 15 to 60 years ( $M = 28.8$ ,  $SD = 8.44$ ). Among the participants, 166 (36.4%) suffered from dental phobia, 120 (26.3%) may be suffered from dental phobia, while 171 (37.4%) had no experience of dental phobia. Most of the reasons of DA were fear of pain (35.86%), prior negative experiences (13.4%), dental anesthetics injection (16.66%), sound of teeth drilling (14.85%), condition of teeth and mouth (6.52%), (5.07%) all the reasons mentioned and (7.60%) other causes, such as infection control and dentist skills.

**Conclusion:** Dental phobia and anxiety among some Saudi Arabian dentists and the public population, usually result in the postponement of routine dental care and adversely affect the patients' oral health.

**Keywords:** Dentophobia, dental anxiety, dental visit.

## Introduction

Odontophobia [Dental Fear (DF) is defined as an individual's response to an actual threatening event or a dangerous situation to protect one's life [1]. An existing specific stimulus, like drilling or injection, can provoke DF [2]. Dental anxiety (DA) refers to a patient's specific reaction toward stress, correlated with dental therapy in which the stimulus is unknown, vague, or not present at the moment [2]. Although in both these situations, the patient's emotional reactions could be practically similar [3].

DF and anxiety are very common. Approximately, 10% to 20% of the adult population in the western industrialized world report high DA; most of the people also report this reaction as having developed during childhood [4]. One study suggests that, in the US, more than 80% of the population fears dental treatment and 20% avoids the dentist due to severe DF [5]. On the

other hand, the prevalence of DF among children varies considerably from 3% to 43% in different populations [4,6]. These differences in prevalence may be due to several parameters, such as methodological or cultural variables in the populations surveyed.

Dental fear and anxiety (DFA) are significantly correlated to irregular use of dental services, delaying and avoiding

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dental treatment, and may also be a risk factor for higher caries incidence [7].

There are many scales to assess DA; Corah DA Scale was proven to be popular and widely used among dental researchers. It is a simple, easy to score, quick to complete, valid, and reliable test for dental visit-associated anxiety [5]. Another scale is the Modified Dental Anxiety Scale (MDAS) provided by Humphris, Morrison, and Lindsay [8] provided a modified scale from the original Corah DA Scale.

Anxiety has psychological and emotional components. DA appears due to three factors; the first one is the novelty. People feel comfortable with a familiar experience and feel discomfort or anxiety with a novel experience. New experiences are often interpreted as threatening and frightening, involving thoughts of fear. The second factor is uncertainty, which contributes to the increased general arousal of the patient. In general, people do not like unknown experiences. Last, is the issue of expectation, the information conveyed by parents or friends can lead to a heightened aroused and anxious state. This often takes the form of negative cognitions that encourage the growth of fear and anxiety [9].

Despite many studies about the prevalence of DFA, to the author's knowledge, there are no similar studies in our region. The aim of this study was to evaluate DA and fear among dentists and the public population and their relation to age, gender, specialists, and frequency of dental visits.

## Subjects and Methods

This study was a cross-sectional questionnaire survey, based on a structured questionnaire that was developed by authors. The targeted population was Saudi and non-Saudi dentists, other medical specialties, and the public. The sample size was estimated using the Qualtrics calculator with a confidence level of 95%; a sample size of 456 was estimated. The inclusion criteria included participants of 15-year old and more, participants who lived in Saudi Arabia, both males and females, individuals who agreed to participate in the study, and participants who understand English or Arabic language. Those who were under the age of 15 years, non-residents of Saudi Arabia, and didn't agree to participate in the study were excluded. Written informed consent was obtained from each participant. If a patient could not read and sign the consent form, we defined him as illiterate and did not include him in the study.

A convenience sampling technique was conducted in hospitals, malls, and dental clinics. Social media outlets (online) were also used to collect the responses. The survey distributed among the study population using electronic surveys through google forms; participants were notified about the purpose of data collection and anonymity of the survey. Data collection was done in the form of the participants' responses to the questions. The questionnaire included demographic features such

as age, gender, and specialty (dentist or other medical specialties, such as medicine, nursing, and pharmacy). The participants were asked about their fear of a dentist visit, causes of anxiety and fear of the dentist, and about the presence of anyone in the family suffering from fear and anxiety of the dentist. Also, they were asked about the date of the last visit and the reasons for the visit and awareness of responders about dental routine visits.

Data was entered on the computer using the "Microsoft Office Excel Software" program (2016) for windows. Data was then transferred to the Statistical Package of Social Science Software (SPSS) program, version 20 (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.) to be statistically analyzed. Data were presented using mean and standard deviation for quantitative variables and frequency and percentage for qualitative ones. A comparison between groups was performed using the Pearson Chi-square test. *p* values less than 0.05 were considered as statistically significant.

## Result

A total of 456 participants responded to our survey; more than half of them [315 (69.1%)] were females and the remaining [141 (30.9%)] were males. Their ages ranged from 15 to 60 years, with a mean of 28.8 years and SD of 8.44 years. Among the participants, 368 (80.7%) were Saudi Arabian, and 88 (19.3 %) were non-Saudi Arabian, but reside in Saudi Arabia. The distribution of specialties showed that 190 (41.6%) were dentists, 159 (34.8%) were non-medical specialists, 85 (18.6%) had other medical specialties, while 23 (5%) were school students.

Our results reported that majority of the participants [59 (13.8%)] visit dentists due to mild dental pain, 76 (16.8%) participants visit due to moderate dental pain, 164 (35.9%) due to severe dental pain, 3.7% participants due to periodontal pain, 121 ( 26.5%) participants visit dentists for routine dental checkup and 17 participants (3.1%) take some analgesics without any advice from dentists and 224 (49.21%) participants suffered from dental phobia visit dental clinic when they experience severe dental pain.

Among the participants, 166 (36.4%) suffered from dental phobia, 120 (26.3%) may be suffered from dental phobia, while 171 (37.4%) had never experienced dental phobia (Table 1).

With regard to the prevalence of dental phobia regarding gender, the females showed higher prevalence of dental phobia than males, where regarding females, 135 (42.85%) suffered from dental phobia, 79 (25.07%) may be suffered from dental phobia compared with 72 (21.98%) ( $n = 72$ ) and 41 (29.07%) of males respectively, while 101 (32.1%) of female participants and 69 (49.6%) of the male participants didn't have dental phobia (Table 1).

The prevalence of dental phobia among dental specialties showed that 43 participants (22.75%) ( $n = 43$ ) suffered from dental phobia, 44 (23.28%) may be suffered,

while 103 (54.49%) had no such experience. Among other medical specialties, 36 (42.35 %) suffered dental phobia, 24 (28.3%) may be suffered, while 25 (29.4 %) didn't suffer from dental phobia. Among non-medical specialties, 78 (64.77%) suffered dental phobia, 41 (25.78%) may be suffered, and 40 (25.15%) didn't suffer. Among school students, 9 (39.13%) suffered from dental phobia, 11 (47.82%) may be suffered, and 3 (13.04%) participants had no such experience (Table 2).

Among the participants, 311 (68.20%) participants had a member or more from their family who suffered from dental phobia, 90 (19.7%) participants maybe had a member or more suffered from dental phobia and 55 (12.06%) didn't have any member of family suffered from dental phobia (Table 3).

Regarding the relationship between participants, who suffered from dental phobia, and their family members, it was found that 108 (34.7%) participants suffered from dental phobia had a member or more of their family who also suffered from dental phobia, 87 (27.8%) participants maybe had a member or more who also suffered from dental phobia, and 116 (37.3%) participants had no such member in their family (Table 3).

Among the participants, 116 (25.4%) visit the dentist when it's necessary, 18 (3.9%) visit the dentist once per

year, 288 (63.2%) visit the dentist twice a year, 4 (0.90%) once every 2 years and 30 (6.6%) didn't know (Table 4).

Association between participants who suffer from dental phobia and their frequency of visiting dentist, it was found that 59 (35.6%) of the participants who suffered from dental phobia visited the dentist only when necessary, 6 (3.6%) participants who suffered from dental phobia visited dentist once a year, and 84 (50.6%) participants who suffered from dental phobia visited the dentist once every 6 months, 2 (1.2%) participants who suffered from dental phobia visited the dentist once every 2 years and 15 (9.0%) participants who suffered from dental phobia didn't know how often they visited the dentist (Table 4).

Regarding the relationship between participants suffered from dental phobia and maybe suffered, and the knowledge about dental clinic visit, it was found that 31.46% ( $n = 268$ ) of participants said they only visit dentists when necessary.

Figure 1 illustrates the most common reasons of DA, which included; (13.40%) prior negative experiences, (16.66%) dental anesthetics injection, (14.85%) sound of teeth drilling, (35.86%) fear of pain, (6.52%) condition of teeth and mouth, (5.07) all of the reasons mentioned and (7.60%) others causes such as infection control and dentist skills.

**Table 1.** Prevalence of dental phobia.

		Are you afraid of visiting the dentist?			Total
		Yes	No	Maybe	
What's your gender?	Female	135	101	79	315
	Male	31	69	41	141
Total		166	170	120	456

**Table 2.** Prevalence of dental phobia among different specialties.

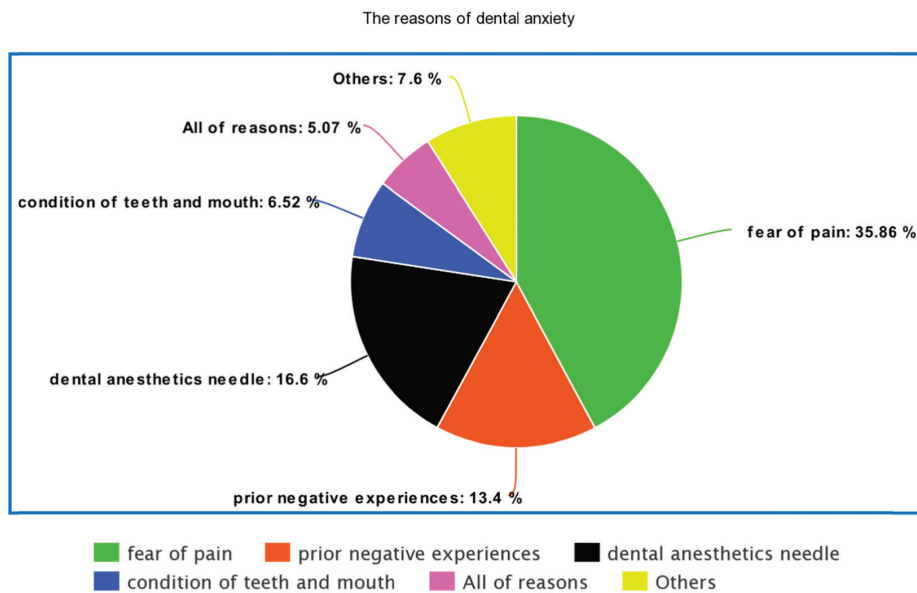
		Are you afraid of visiting the dentist?			Total
		Yes	No	Maybe	
What is your specialty?	Dentistry	43	102	44	189
	Other medical	36	25	24	85
	Non-medical	78	40	41	159
	School student	9	3	11	23
Total		166	170	120	456

**Table 3.** Association between the prevalence of dental phobia among family members and the participant who suffered from dental phobia.

		Are you afraid of visiting the dentist?			Total
		Yes	No	Maybe	
Do you have a family member who is afraid to visit a dentist?	Yes	108	116	87	311
	No	17	31	7	55
	Maybe	41	23	26	90
Total		166	170	120	456

**Table 4.** Association between the frequency of visiting the dentist and dental phobia participant for visiting the dentist.

		Are you afraid of visiting the dentist?			Total
		Yes	No	Maybe	
How often should we go to the dentist?	Only when necessary	59	26	31	116
	once a year	6	7	5	18
	once every 6 month	84	127	77	288
	once every 2 years	2	2	0	4
	I don't know	15	8	7	30
Total		166	170	120	456



**Figure 1.** Reasons for DA.

Regarding the association between participants' socio-demographic characteristics and DA, the study constituted most of the females participants [135 (42.85%)], participants who aged from 26 to 35 [62 (42.46%)], non-medical specialists [78 (64.77%)], while Saudi participants [128 (34.78%)] were the participants who had the highest incidence of DA (Table 5).

**Discussion**

The prevalence of DA in our study was found to be 45.4%, which proposes that despite the technological advancements made in modern dentistry, anxiety correlated with dental treatment was prevalent in the study population. Prevalence was higher than that recorded in studies done by Do Nascimento et al. (23%) [10], and Gaafar [11], who studied prevalence of DA among adult patients attending the dental clinics at the University of Dammam, Saudi Arabia and found that the prevalence of DA among the study sample was 27%. But, it was less than the study conducted by Madfa et al. [12] (63%) and Malvania and Ajithkrishnan [13] (46%). This difference can be associated partly with the

methodological differences and geographical variations. Furthermore, the overall level of fear of dental work among our population was 36.4%, similar to the Iranian and Saudi population [14].

In this study, the prevalence of DF was higher among females than males, which is in agreement with the findings described in previous studies [15–17]. In the literature, although Kanegane et al. [18] reported no relationship between gender and DA, many studies have shown that DA is more common in women [19–21]. The result of our study is matched with the most recent studies which reported a higher prevalence of DA among females than those reported among males, where females are more able to express their feelings of fear, also, physiological conditions such as social phobia, stress, fear, depression, and panic are more prevalent among females, and DA may be associated with such emotions [19].

Several previous studies reported that there was an inverse relationship between age and levels of DA [22,23]. This is not a universal finding [24]. Despite,

**Table 5.** Association between participants' socio-demographic characteristics and DA.

Socio-demographic characteristics	Yes		DA No		Maybe		
	N	%	N	%	N	%	
Gender	Female	135	42.85%	101	32.1%	79	25.07%
	Male	72	21.98%	69	49.6%	41	29.07%
Age	15–25 years	58	21.80%	96	36.09%	72	27.06%
	26–35 years	62	42.46%	48	32.87%	36	24.65%
	36–45 years	36	55.38%	18	27.69%	11	16.92%
	>45 years	10	43.47%	8	34.78%	1	4.34%
Specialists	Dentistry	43	22.75%	103	54.49%	44	23.28%
	Other medical students	36	42.35 %	25	29.4 %	24	28.3%
	Non- medical students	78	64.77%	40	25.15%	41	25.78%
	School students	9	39.13%	3	13.04%	11	47.82%
Nationality	Saudi Arabian	128	34.78%	144	39.13%	96	26.08%
	Non-Saudi	38	43.18%	26	29.54%	24	27.27%

in the present study, DA was found to be lower in the older age groups, these results matched with Caltabiano et al., [25]. Younger age groups reported higher means for MDAS compatible with the research [22], which has found an increase in anxiety in the early adult years. This may be due to increased exposures over time, allowing patients to develop a tolerance to treatment, and therefore have less anxiety as they age.

DA has several causes, and hence it is considered complex and multifactorial [26]. The causes may be patient, provider or environment-related. The patient-related causes include past dental experience, pain, the influence of family, or peer experience and personality, whereas provider-related causes include communication techniques and provider's bad behavior. Environment-related causes include sounds of drills or other apprehensive patients, unpleasant smell/clinic area, and the sight of blood or local anesthetic injections [27]. Our findings indicate that a fear of pain was the most inducing factor in DA than those dental anesthetics injection, these results mismatched with Taani et al., [14] who reported that anxiety toward injection scored the highest mean score, which was similar to the findings in Danish adults.

The limitations of this study include the criterion validity that could not be established using standard scales due to the non-availability of translated and validated DA questionnaires. Also, it should be pointed out that a cross-sectional study design, in which data collected using self-administered questionnaires, leads to the occurrence of memory bias and reverse causality, which recommends the need for more research using different study designs. Most of our participants had a medical background; therefore, studies on larger and different populations are needed to reveal the prevalence and enormity of DF and anxiety in society.

## Conclusion

Dental phobia and anxiety among some Saudi Arabian dentists and the public population, usually result in the postponement of routine dental care and adversely affect the patients' oral health.

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## List of Abbreviations

DFA Dental fear and anxiety

## Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

## Funding

None.

## Consent for publication

Informed consent was obtained from all the participants.

## Ethical approval

The study was approved by the Human research ethical Committee, of Alfarabi college in jeddah at 8/21/2019, letter number 19-08/1.

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