

Evaluating factors associated with fear and anxiety to dental treatment—A systematic review

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ABSTRACT

Introduction: Dental anxiety refers to a set of complex psychological issues bearing a significant impact in individual's lives reflecting in the form of dental visit avoidance, poor dental health status and decreases oral health related quality of life. Hence, it is imperative to consider those factors associated with dental anxiety so as to treat and promote better oral health. The review aimed to assess various factors associated with dental fear and anxiety. **Materials and Methods:** Literature search was done from Pubmed and Google scholar search engines to identify publications which explored factors associated with dental fear and anxiety. **Results:** Research evidence pointed a significant relationship of age, gender, maternal anxiety, previous dental experience, and number of siblings with dental fear and anxiety (DFA). **Conclusion:** Findings of the review clearly suggest that a better understanding of factors causing dental anxiety and phobia will help preventing dental avoidance and providing better care.

Keywords: Age, dental anxiety, dental fear, gender, maternal anxiety

Introduction

Dental fear and anxiety (DFA) contribute significantly to the avoidance of dental care. Dental anxiety is referred to the anxiety related with thought of seeing a dentist for preventive or therapeutic procedures.^[1] It has been stated as the fifth most prevalent reason for anxiety.^[2] Anxiety is experienced even in daily activities like when making crucial decisions, exam time, in work place, entry to job market, etc., It is thus an emotional condition preceding the actual encounter that threatens a stimulus, which cannot even be identified sometimes.

A reaction evoked to a known stimuli or perceived threat is called fear, resulting in a fight or flight situation. Phobia on the other hand is continuous, non-realistic, and intense fear for a particular stimulus resulting in avoiding the perceived threat totally.^[3] "Odontophobia" is the term described for irrational fear of dental treatment existing along with signs of terror, hypertension, trepidation, and unease as specified in the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV and the International Statistical Classification of Diseases and Related Health Problems (ICD)-10.^[4]

Anxiety and fear are pretty much similar, formed by similar elements functioning in the same way. While emotions of anxiety are diffuse rather than specific as associated with fear and is witnessed in various situations and events. On the contrary, anxiety can be felt even when the feared stimulus is absent. DFA today is a significant issue in managing patients and these patients often delay or avoid in dental treatment seeking and turn down

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appointments. This in turn results in a vicious circle causing a higher prevalence and severity of dental disease co-found with delayed dental visits owing to DFA.

Severity of dental anxiety can be assessed using standardized questionnaires, of which dental anxiety scale is the most accepted and commonly used. Studies are conducted to assess various factors such as gender, age, education level, parental anxiety, and several others to bear an impact on fear and anxiety in dental patients.^[5] While a study^[6] found no differences in dental anxiety prevalence related to socio demographic factors in children, another study^[7] reported no difference amongst gender in their study group. Hence the present review will be done to assess the impact of sociodemographic and environmental factors on dental fear and anxiety. Thus the review aimed to evaluate various socio demographic and environmental parameter influencing fear and anxiety in dental patients. Understanding fear and anxiety, and its factors helps the dentist to achieve patients' compliance and success in dental treatment.

Methodology

Electronic searches, Literature search was done using databases of PUBMED/Medline and Google search databases. Only those studies assessing or exploring factors associated with dental anxiety were included. Terms used for the search was as per the MeSH; dental anxiety, fear, dental treatment, pain, patients. Data from dissertation work or unpublished data was not included for the review.

The institutional review board at the university approved the study and was in accordance with the ethical principles of the World Medical Association Declaration of Helsinki (2013). Selection criteria—Studies included in the review were descriptive studies, case control, prospective study and systematic reviews published between 2000 and 2020 assessing various parameters influencing fear and anxiety for dental treatment.

Data collection—The review author independently scanned the title, abstract, or both of every record retrieved in order to determine which study would be assessed further. All potentially relevant articles were considered as full text. If any discrepancy was noted, the study authors were mailed for clarification. An adapted PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analysis) flow chart is presented for study design [Figure 1].

Data extraction and management—Those studies which fulfilled the inclusion criteria, the author independently abstracted characteristics such as author, sample, and place of study, study design, prevalence and findings.

Outcome assessed: DFA associated with factors such as age, gender, education, parental influence (if patient is a child), previous dental experience, family structure.

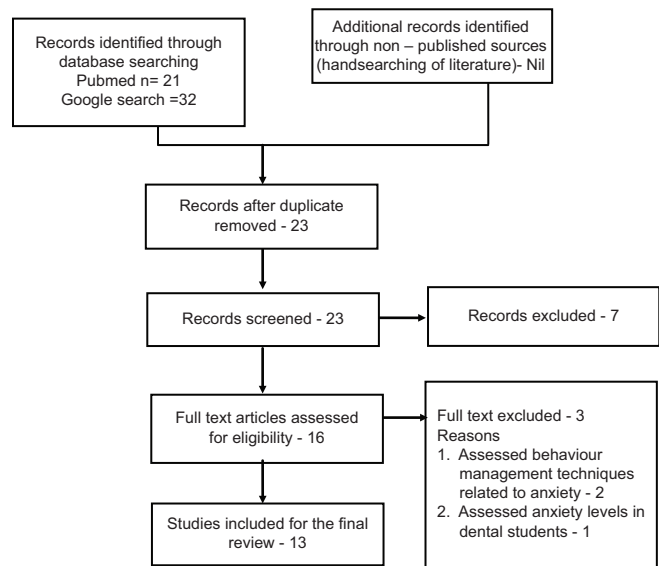


Figure 1: Flow diagram representing data extraction for review

Assessment of risk of bias in included studies—The author independently assessed risk of bias for each included study by employing the Cochrane's collaboration tool for assessment of risk of bias. Parameters for measuring risk assessment were research question, study population (demographics, location and period), groups recruited (eligibility criteria), sample size justification and outcome assessment. Only studies of moderate and high quality were included for the review.

Results

A total of 13 studies were included in the review. Exploratory factors associated with dental anxiety were age, gender, previous dental visits, maternal/parental anxiety, family structure, and number of siblings.

10 out of 13 studies evaluated the role of gender in influencing DFA. 6 studies among them had reflected a significant relationship of gender with dental anxiety, while the rest 4 found no differences between gender and dental anxiety. 4 out of the 10 studies showing positive correlation of gender with DFA found that females were anxious than males. 7 studies analysed the effect of age with DFA, of which significant findings were found in 5 studies. It was found that as age advanced, the occurrence DFA decreased [Table 1].

5 studies tried to evaluate previous dental experience of study participants in influencing DFA, of which 3 studies reported a significant relationship. While 1 study specifically assessed DFA with severity and extent of dental caries and found no correlation between the same. Parental dental fear was a significant factor in increasing dental anxiety levels as seen in 3 studies. Family structure also is an important factor to be considered in DFA, with children of single parent exhibiting lesser anxiety levels than nuclear families children, as seen in a study [Table 1].

Table 1: Characteristics of the study included

Authors (Year)	Sample population	Sample size	Study location	Risk factor assessed	Instrument used	Dental Anxiety Prevalence	Findings
Dahllander A <i>et al.</i> , 2019 ^[8]	7-9 years	160	Public Dental Service clinic in Södertälje, Sweden.	Parental dental fear, tooth ache experience, report of painful dental treatment and caries development	Children's fear survey schedule dental subscale (CFSS - DS)	22.9 and 25.4 mean CFSS - DS at 7 and 9 years	All risk factors were significant in development of DFA
Wasiu Olalekan Olawole <i>et al.</i> , 2019 ^[9]	>16 years	172	Department of Dental and Maxillofacial Surgery, Federal Medical Centre, Birnin Kebbi, Nigeria.	Previous dental visit and Gender	9 item questionnaire	47.7%	Previous dental visit history had a statistically significant relationship with dental anxiety ($P=0.049$) Females were found to be more anxious than males
Lingli Wu <i>et al.</i> , 2018 ^[10]	9-13 years	405	Hong Kong	Family structure, presence of siblings and gender	Corah Dental Anxiety Scale (CDAS) and Children Fear Survey Schedule-Dental Subscale (CFSS-DS)	33.1% of children	Children with siblings reported greater DFA (37.0% vs. 24.1%). Single parented children had lesser CFSS - DS score than those of nuclear families.
Razavian H <i>et al.</i> , 2018 ^[11]	14-60 years (mean=35.5 years)	60 (39 women and 21 men)	Two clinics in Esfahan	Age, gender, education and Patient's past Root canal treatment experience	Persian version of STAI - T (Spielberger Trait Anxiety Inventory)	37% moderate to severe anxiety	No correlation between age, gender and education to dental anxiety was noted.
Sathyaprasad <i>et al.</i> , 2018 ^[12]	5-10 year old children	462 (240 males and 222 females)	India	Age, Gender, Culture Maternal anxiety	Children fear survey schedule - dental subscale	24.5%	No significant association existed between age, gender and culture with DA ($P>0.05$) Statistically significant association was found between maternal and child dental anxiety ($P=0.000$)
Abanto Jenny <i>et al.</i> , 2017 ^[13]	3-5 years	100	Pediatric Dentistry Dpartment of Dental School at University of Sao Paulo, Brazil	Age, Number of siblings, Severity or extent of dental caries	Facial Image Scale (FIS)	39% prevalence (FIS score 2 or 3)	Older age is associated with low dental anxiety, and more number of siblings is associated with high dental anxiety in preschool children, whereas the severity or extent of dental caries is not associated
Eroglu CN <i>et al.</i> , 2017 ^[14]	10-50 years	200 (115 females and 85 males)	Department of Maxillofacial Surgery (A) in Konya and Van province	Sociocultural differences, history of previous dental procedure, psychiatric therapy, age, and gender	State-Trait Anxiety Inventory (STAI), Dental Anxiety Scale (DAS), and Dental Fear Scale (DFS),	Mean DAS was 10.30 ± 3.42 and 10.16 ± 3.61 in Konya and Van respectively	Gender, sociocultural differences, and previous bad experiences of the patients are the major factors that can lead to problems in the future procedures.

Contd...

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Authors (Year)	Sample population	Sample size	Study location	Risk factor assessed	Instrument used	Dental Anxiety Prevalence	Findings
Rajwar AS <i>et al.</i> , 2017 ^[15]	3-14 year old	420 (218 males and 212 females)	India, Dept. of Pedodontics, MAIDS	Age, Gender	DFS, FIS (Facial image scale), CFSS - DS (children's fear survey dental subscale)	Prevalences was 14.3%, 22.6% and 7.4% according to DFS, FIS and CFSS - DS respectively	Dental anxiety declined as age progressed and females were more fearful when compared to males as per the three scales measured.
Tuba Talo Yildirim <i>et al.</i> , 2017 ^[16]	10-70 years	231 (115 males and 116 females)	Turkey, Mouth and Health centre in Diparbakir,, Department of Periodontology	Age, Gender and Education level	DFS, DAS, STAI - S, BDI (Beck Depression Inventory)	The mean DFS, DAS, BDI, STAI-T, and STAI_S were 45.64, 9.15, 13.16, 38.90, and 40.18 respectively	DA was more common in females. As education increased, DA decreased. Age had an important effect on all scales ($P<0.05$)
Patturaja K <i>et al.</i> , 2016 ^[17]	-	50 (25 males and 25 females)	Chennai, India	Gender	10 variable questionnaire	Prevalent in all	40% anxiety levels were noticed in females and 28% in males.
Mayank Kakkar <i>et al.</i> , 2016 ^[18]	10-14 years	250 (125 males and 125 females)	2 schools in Belgaum, India	Age and previous dental experience	CFSS-DS Children's Fear Survey Schedule - Dental Subscale questionnaire.	42% prevalence	Scores for dental fear decreased with increasing age and experience
Mohammed RB <i>et al.</i> , 2014 ^[19]	15-65 years	340 (160 males and 180 females)	Vishakapatnam	Age and gender	CDAS and DCAS	77.4%	Mean score levels of CDAs were significantly higher in females than males at $P<0.0001$ Anxiety levels were higher between 25- 35 years as compared to 55-65.
Dikshit P <i>et al.</i> , 2013 ^[20]	> 20 years	101 (48 males and 58 females)	Department of Pediatric Dentistry, Kantipur Dental College Teaching Hospital & Research Center, Kathmandu, Nepal.	Parental anxiety when accompanying their ward to the dental clinic	Dental Anxiety Scale-Revised (DAS-R)	37.6% (moderate to high prevalence)	Anxiety levels of parents influenced child's anxiety levels. No significant differences were seen between genders or in any age.

Discussion

The review aimed to evaluate various sociodemographic and clinical factors associated with dental fear and anxiety in various groups. Anxiety poses grave repercussions when considering an individual's oral health and can become an important barrier to dental attendance resulting in poor attendance or dental avoidance. This in turn can result in poor oral health or the need for speciality dental care. DFA is also thought to influence quality of life with low oral health quality of life correlating to severe dental anxiety.^[21,22]

Age and gender was the most commonly evaluated factor in DFA and was also found to be significantly associated with anxiety, in all age groups. It was observed that younger age patients

were more anxious than their older counterparts. This finding is in consensus with the belief that a child's cognitive capability grows with increasing age, thereby resulting in better awareness and understanding. Young children become anxious due to the feelings of unknown and of being abandoned.^[23] Girls were generally more anxious than boys in the present review. These findings can be attributed to certain factors like the cultural setup of the sample being assessed, different scales used, willingness to accept their feelings and the real differences present between the genders.^[24,25]

More number of siblings bearing a significant impact on DFA could be due to their exposure to dental procedure during other sibling's therapy or them observing them displaying anxious behaviour while getting treated.^[26]

Children whose parents are anxious to dental treatments either pass on this information to their wards or they see the feelings of anxiety which by all means get reflected with similar magnitude in development of dental anxiety.^[25] But this feeling could get modified after the first dental visit, with the child's experience influencing and weighting the anxiety levels over his or her parent. Previous visits to the dentists significantly impacts anxiety levels by establishing a dentist—patient trust which matures and gets stronger with age. Hence, the review found that as age advanced, anxiety levels declined.

Speaking of pregnancy, dental phobia, lack of dental awareness, financial barriers, difficult access to dental service, misunderstandings/misconceptions about dental care during pregnancy, and low priority for oral health are some of the reasons for reduced utilization of oral care in pregnant women.^[27] In a cross-sectional study, Modified Dental Anxiety Scale (MDAS) was used to assess dental anxiety and phobia among pregnant women visiting hospitals in Dhahran, Khobar, and Dammam in Saudi Arabia. The score of MDAS ranges from 5 to 25, and a cutoff value of 19 was used to identify participants with dental phobia. The study analyzed data of 825 participants, and the prevalence of dental phobia was appreciated in a considerable proportion. Having bad dental experience and being in first trimester of pregnancy were significantly associated with increased odds of dental phobia.^[28]

In spite of the significant associations found between many factors and DFA, it could possibly be that various etiological factors might have influenced the development of DFA. An individual might have had a bad past experience, which might have occurred in childhood and exhibits anxious traits. An interaction of all the factors cannot be overlooked. This concept is well summarised by Liddell and Locker in their statement “It is impossible to say from this study whether the experiences were, in fact, very traumatic, or whether the subjects were more sensitive to them”.^[29]

The dental team play an important role in realizing the concept and factors associated with DFA as it affects dental health status, dental attendance, and also quality of life. First encounter of the patient is with the dental receptionist who must listen for emotional content as well as factual content—noticing rhythm, pitch, volume, and speed will give lots of information about this. Dental nurses or dental operators can help reassure anxious patients by reflecting empathy, having good listening skills and hold an ability to explain things to the patient in a comforting apprehensible language. This has the effect of “normalizing” their fear need.^[30]

As a primary oral care physician, it is important to assess the coping of patient with adverse events, associated factors and motivational level to deal with the overcoming fear of dental treatment. This will eventually help the dental clinicians to develop a rapport with the patient, decide for coping strategies and use pharmacological interventions to ease the patient.

Helping patients overcome dental or needle phobia is the most difficult of all and cannot be managed with traditional behavior shaping practices such as acclimatization, positive reinforcement, tell-show-do, or confidence building alone. Even cognitive behavioral therapy can only help the milder cases. Hypnosis or neurolinguistic programming skills are needed for the truly phobic.^[30]

The dentist can even approach for psychiatric referral if suspects emotional psychiatric involvement in the patient.

Conclusion

Understanding the magnitude of patient's fear in preventing dental visits and dental anxiety occurrence has direct implications in dental practice. Identifying the exploratory factors will enable the dentist to appropriately plan his/her treatment plan to reduce DFA which in turn reduces workplace stress.

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Conflicts of interest

There are no conflicts of interest.

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