Evaluation of the Influence of Parental Anxiety on Children’s Behavior and Understanding Children’s Dental Anxiety after Sequential Dental Visits

Abstract
Background: Identifying anxiety levels of parents accompanying their children can help the clinician in designing the behavior management strategies for the child. In addition, continued dental experience can improve the child’s response, indicating desensitization to dental stress. Aims: To evaluate the influence of parental anxiety on children’s behavior and understanding children’s dental anxiety after sequential dental visits. Materials and Methods: A total of 175 children of age 6–12 years, 98 were boys and 77 were girls, were randomly selected from various schools of Navi Mumbai. Parental dental anxiety was assessed using the Corah’s dental anxiety scale (DAS), and child anxiety level was measured using children fear survey schedule-dental subscale (CFSS-DS). Statistical Analysis Used: Pearson’s correlation coefficient analysis, ANOVA, and Friedman test. Results: There is a significant positive correlation ($P < 0.0001$) between DAS scores and CFSS-DS scores at all three dental visits. The mean ± standard deviation, CFSS-DS scores at the first, second, and third dental visits are (34.07 ± 11.97), (31.04 ± 10.94), and (27.26 ± 9.39), respectively, showing the score is more during the first dental visit than the second and third visits. Conclusion: The dental anxiety levels in parents may influence the anxiety levels of children and also all children exhibited an improvement in the levels of dental anxiety from the first dental visit to the subsequent dental visits.

Keywords: Children fear survey schedule-dental subscale, children’s anxiety, Corah's dental anxiety scale, parental anxiety

Introduction
Anxiety and fear of dental treatment in children have been recognized as sources of serious health problems.[1] Dentists treating children must acknowledge that uncooperative children may have a personality type, cognitive dysfunction, or other special need. Successful treatment of such patients requires both specialist knowledge and attention, and dentist should be prepared to offer that.[2]

Mild fear and anxiety are expected experiences, consistent with normal development, but they become a concern and require treatment when the fear or anxiety is disproportionate to the actual threat and daily functioning becomes impaired. One of the well-accepted statements about anxiety is that it is a multidimensional construct that consists of somatic, cognitive, and emotional elements.[2]

The concepts dental fear, dental anxiety, and dental phobia are often used interchangeably within dental literature. Dental behavior management problems (DBMPs) on the other hand are defined by the dentist’s experience when treating the patient. It is a collective term for uncooperative and disruptive behavior, which result in delay of treatment or render treatment impossible, regardless of the type of behavior, or its underlying mechanisms.[2]

The influence of parental anxiety on children’s behavior is well recognized by dentists in clinical situations. Parents are known to subtly transmit feelings of fear and anxiety to their children. Of the two parents, mothers with high anxiety levels have most often been shown to exert a negative influence on their children’s behavior. It has been suggested that one can understand, predict, and influence a child’s dental behavior through the mother’s attitude toward dental care.[3]

Many measurement techniques have been proposed to assess dental fear and anxiety and DBMPs; behavioral ratings, psychometric scales, physiological measures, and projective techniques.[3]
The present study is an attempt to determine the effect of parental anxiety on their child’s level of dental anxiety and to see whether gradually exposing children to the dental environment would decrease their levels of dental anxiety.[4]

**Aim**

To evaluate the influence of parental anxiety on children’s behavior and understanding children’s dental anxiety after sequential dental visits.

**Objectives**

1. To determine the relationship between parents’ anxiety level and that of the child patient
2. To determine the levels of dental anxiety on gradually exposing children to the dental environment.

**Materials and Methods**

The present study was conducted in Department of Pedodontics and Preventive Dentistry in Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai.

The study was conducted on 175 children of age 6–12 years. Of these 175 cases, 98 were boys and 77 were girls, randomly selected from various schools of Navi Mumbai.

**Inclusion criteria for selection of the case in the study**

1. Children both male and female between 6 and 12 years of age
2. Children who are attending the dental clinic for the first time
3. Children attending dental clinic with parents.

**Exclusion criteria for rejection of the case in the study**

1. The cases with known congenital anomaly, developmental, and/or systemic disorders
2. Cases with a history of prolonged illness
3. Children who had previous dental experiences.

The research protocol was initially submitted to the Institutional Ethical Committee and Review Board and after ethical approval, all cases were verbally informed and written informed consent was taken for participation in the study. The study was conducted as per Good Clinical Practices guidelines and Declaration of Helsinki.

Data collection was carried out using the Corah’s dental anxiety scale (DAS) and children fear survey schedule-dental subscale (CFSS-DS).

The questionnaires of the scales were available in English, Marathi (a local language), and Hindi.

Parental dental anxiety was assessed using the DAS. The DAS comprises of four multiple-choice questions dealing with the individual’s reactions and expectations of going to and being treated by a dentist.

Each question consists of five response alternatives ranging from 1 (no anxiety) to 5 (extreme anxiety) and yields a total score of between 4 (not anxious) and 20 (extremely anxious), score 12 and above indicates high dental anxiety.

Child anxiety level was measured using CFSS-DS was administered to child patients who attended the dental clinic for the first time.

CFSS-DS consists of 15 items covering different aspects of the dental situation, each scored on a five-point scale, ranging from 1 (not afraid) to 5 (very afraid).

Total score ranges from 15 to 75 and scores of 38 and above are indicative of dental fear.

Both the scales were completed while the child and parent were in the waiting hall on the 1st day of their attendance and before any form of dental procedure was performed.

After the first visit, only the anxiety level of the child was again taken during the consecutive second and third visit to determine their anxiety level on sequential dental visits.

**Statistical analysis**

The relationship between parent’s anxiety level and that of the child patient was correlated using Pearson’s correlation coefficient analysis and the anxiety level of children on gradual exposure to the dental environment was analyzed using ANOVA and Friedman test.

**Observations and Results**

Table 1 shows a significant positive correlation ($P < 0.0001$) between DAS scores and CFSS-DS scores at all three dental visits using Pearson’s correlation.

Table 2 shows the mean ± standard deviation CFSS-DS score at the first dental visit (34.07 ± 11.97), at the second dental visit (31.04 ± 10.94), and at the third dental visit (27.26 ± 9.39). The mean CFSS-DS score is more during the first dental visit than the second and third dental visits.

Table 3 shows a positive reduction seen in CFSS-DS total scores from the first dental visit.

**Discussion**

Child dental anxiety has the potential to play an important and detrimental role in a child’s dental and general health.[9]
Some authors define “dental anxiety” as a feeling of apprehension about dental treatment not necessarily related to a specific stimulus, while “dental fear” is a normal emotional reaction to one or more specific threatening stimuli in a dental situation.[6]

Worldwide statistical analysis has demonstrated that between 3% and 43.4% of children exhibit dental anxiety.[2,7]

Kent (1985) stated that one of the most consistent findings in dental anxiety research is that nonanxious patients make accurate predictions of the degree of discomfort they will feel during an appointment, while anxious patients make clinically significant overpredictions, that is, they expect much more pain than they subsequently experience.[9]

Considerable effort has been done in understanding the etiology, development, and treatment of dental fear in children.[9] The etiology of child dental fear is considered multifactorial and different pathways of acquiring fear have been described.

For example, Rachman[10] proposed a three-pathway model of acquiring fear: directly through direct conditioning or indirectly through modeling or negative information.

Therefore, pediatric dentists must consider the multifactorial etiology of anxiety to gain a better understanding of pediatric patients and their families. Indeed, the assessment of anxiety should be a part of the dental evaluation of children and adolescents.[11]

Parents’ perception of dental appointments being unpleasant may be passed onto children. An assessment of parents fear prior to child’s dental treatment may help the clinician in modifying behavior management strategies. Whenever parental anxiety is high, efforts to reduce the parents’ level of anxiety may also benefit the child. Providing parents with information about their child’s dental treatment has been found to be an effective intervention in reducing the preoperative anxiety of the parents.[12]

Initially, dental experience appeared to sensitize the child to dental procedures. Experience may also allow the child to accurately distinguish between stressful and nonstressful procedures.

Venham et al. have also shown that the behavior of children improves in subsequent dental visits. The improvement during subsequent visits suggests that the experience gained by the child during previous visits helped the child to recognize the nonthreatening aspects of the visits and to deal with stressful dental procedures.[13]

Various studies have been conducted to assess the correlation between parent’s anxiety levels and their children and to see whether gradually exposing children to the dental environment would decrease their levels of dental anxiety.[14,15]

According to Tickle et al.,[14] children whose parents are anxious are more likely to report anxiety. Further, Themessl-Huber et al.[15] in their review about dental fear showed that irrespective of measures used, most studies find a significant relationship between dental fear of parents and children. Interestingly, dental fear correlated significantly among parents. It seems that health habits and health behavior are shared between family members. Poor tooth brushing habits are associated with dental anxiety of young adults and children seem to pick up the dental health habits and behavior patterns of their parents.[16] Mothers with high levels of dental anxiety exerting negative influence on their children have been depicted by Ripa.[17]

Folayan et al.[3] reported significantly high level of dental anxiety among mothers as compared to fathers. Some studies suggest a correlation between parents’ anxiety levels and those of their children (Themessl-Huber et al.[15] and Boman et al., 2008[18] in a meta-analysis demonstrated a significant relationship between parental and child dental anxiety). Parental anxiety has perhaps received the most attention within literature as an important external factor that may influence the child’s anxiety and behavior within the dental setting; Lee et al., 2008[19], Lara et al., 2012.[20] On the other hand, other studies report that compared to other factors, parents’ fear and anxiety do not have significant effects on children’s anxiety and fear.[21]

Oppenheim and Frankl et al.[22] found no change in cooperative behavior during an exam visit followed by a dental treatment visit.

Similar studies have been conducted on Indian population. Singh et al. from their study extended the universal applicability of CFSS-DS in Indian cases.[23]
Suprabha et al. (2010) studied the association of age, gender, family characteristics, previous medical experience, and previous dental experience with dental fear as well as dental behavior of the child. They concluded that in 7–14-year-old although dental fear can significantly influence dental behavior, the factors affecting them are not the same.\cite{24}

Beena study showed the prevalence of dental fear in 6–12-year-old children was not statistically significant correlation between the level of dental fear and dental caries in these children.\cite{25}

Raj et al. showed that dental fear in 4 to 14 year olds decreased as age increases. Total fear scores also exhibited no strong overall sex difference or age by sex interaction.\cite{26}

Based on the results of above-mentioned studies, it is evident that there exists a need to study more about the recent scenario of parental influence on child anxiety level and the effect of sequential dental visits on children.

Therefore, the present study was conducted with the objective of trying to determine the relationship between parent’s anxiety level and that of the child patient and determine the levels of dental anxiety on gradually exposing children to the dental environment.

However, results showed the positive correlation between parental anxiety level and their children at all three dental visits [Table 1]. The possibility of parents subtly transferring their dental fear on children in clinical situations is well recognized from the results.

However, the findings are in accordance with Themessl-Huber et al.,\cite{15} who in a meta-analysis demonstrated a significant relationship between parental and child dental anxiety.

Other studies also suggest a correlation between parents’ anxiety levels and those of their children.\cite{15,18-20}

However, it should be noted that the correlation test used in this investigation considered the average of all instruments/equipment and there was a significant variation between the anxiety levels caused by the different instruments.\cite{27}

Parental anxiety has perhaps received the most attention within literature as an important external factor that may influence the child’s anxiety and behavior within the dental setting.\cite{12}

Results also showed a significant positive reduction seen in change of anxiety level of children from the first dental visit to subsequent dental visits [Tables 2 and 3]. Hence, it had been seen that children showed a decrease in their anxiety levels over time.

This is in accordance with Frankl et al.\cite{28} who studied the cooperative behavior of children 3-5 year old during a dental exam visit and one subsequent dental treatment visit who concluded that cooperative behavior increased on the second visit.

Rayen et al. showed that most of the children were anxious on their initial visit for dental treatment. All children exhibited an improvement in behavior on subsequent visits and younger children tend to display more negative behavior.\cite{29}

### Conclusion

In the present study, the influence of parental anxiety on children’s behavior and understanding children’s dental anxiety after sequential dental visits were evaluated.

Based on the results of this study, the following conclusions were drawn:

1. The dental anxiety levels in parents may influence the anxiety levels of children. Therefore, identifying anxiety levels of parents accompanying their children can help the clinician in designing the behavior management strategies for the child accordingly.

2. All children exhibited an improvement in the levels of dental anxiety from the first dental visit to the subsequent dental visits. Therefore, with continued experience, the child’s response improved, indicating desensitization to dental stress.

The extent of anxiety a child experiences does not relate directly to dental knowledge but is an amalgamation of personal experiences, family concerns, disease levels, and general personality traits.

Decisions about treatment should not be based on proper dental diagnosis only. An assessment and management of the anxiety level of the parents’ may be necessary to adequately manage that of the child to break the vicious cycle of anxiety that may be set up in the family regarding dental care.

Strategies for the assessment, prevention, and control of dental anxiety should be implemented to allow better treatment for children, adolescents, and their parents.

It is possible to conduct a simple, efficient evaluation of anxiety in the routine of a pediatric dental clinic with the use of validated tools.

An adequate approach regarding children and adolescents with dental anxiety can assist in establishing a good dental experience and a trusting relationship between pediatric dentists, patients, and parents.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.
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