

## Original Research Article

# Maternal dental anxiety as a risk factor for dental caries in children: a cross-sectional study

Tasneem S. Ain\*, Saima Sultan, Owais Gowhar, Ravishankar T. L.

Department of Public Health Dentistry, Kothiwal Dental College & Research Centre, Moradabad, Uttar Pradesh, India

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### \*Correspondence:

Dr. Tasneem S. Ain,

E-mail: [khantasneemdr@gmail.com](mailto:khantasneemdr@gmail.com)

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### ABSTRACT

**Background:** The prevalence of dental caries among children is quite enormous; parental dental anxiety being one of the factors for this burden of disease. Environment of the family has a significant bearing on children's oral health. Mothers who have a fear of dental treatment delay or avoid their children's timely and appropriate treatment of oral health problems which ultimately lead to poor oral health among children; dental caries being the most common one. **Aim:** To assess the association of dental anxiety among mothers with the dental caries among their children.

**Methods:** A cross-sectional questionnaire based study was carried out at various private dental clinics in Kashmir, India. 200 mother-child pairs were selected for the study. To assess the dental anxiety level of mothers, Modified Dental Anxiety Scale (MDAS) {Urdu version} was used. Dental caries (DMFT/dmft) of their children was recorded using World Health Organization (WHO) criteria.

**Results:** The caries experience (mean dmft/DMFT of children with highly anxious mothers was higher than those with less anxious and non-anxious mothers. The children whose mothers were 'extremely anxious' (phobic) had the highest mean dmft/DMFT ( $4.06 \pm 1.99$ ) while the mean DMFT was least ( $1.03 \pm 2.01$ ) among those children whose mothers were non-anxious. The difference was found to be statistically significant ( $p < 0.05$ ).

**Conclusions:** It was concluded that occurrence of dental caries was more in children of highly anxious mother's and hence there exists the association between the mother's dental anxiety and their children's dental caries prevalence.

**Keywords:** Children, Dental anxiety, Dental caries, Mothers

### INTRODUCTION

Anxiety has been defined as a "state of unpleasantness with associated fear of danger from within or a learned process of one's own environment".<sup>1</sup> Anxiety and fear towards dental treatment are common problems frequently experienced by patients worldwide. Dental anxiety is ranked fourth among common fears and ninth among intense fears.<sup>2</sup>

Occurrence of dental anxiety has been attributed to factors like personality characteristics, traumatic dental experience in childhood (conditioning experiences), vicarious learning from dentally anxious family members or peers, perception of body image, blood injury fears

and pain reactivity.<sup>3</sup> Due to this anxiety, patients hesitate to present for check-ups or worse present only when the condition might deteriorate and pain is the only reason that forces them to visit the dentist. Similarly, parents may present their children late to the clinic as is well known; mothers majorly impart most influence on a child's behaviour and psychological development.

Due to their previous dental experience, mothers' attitude and anxiety levels have been found to have a direct influence on the child's attitude and anxiety levels. A mother suffers of anxiety as a result of her own previous dental experience inherited to her offspring, thus giving rise to a dental phobia towards dental treatment with a child who builds his/her own preconceived

misconceptions. Therefore; parental anxiety affects the behaviour of the child during dental treatment and ability of the child to cope with, as a result of their own fear.

Dental anxiety in adults is associated with poor health, poor oral health practices, irregular dental attendance, increased incidence of caries and dental fear in their offspring. Poor parental oral health practices undermine and compromises good oral health in children. If children continue to be neglected for their teeth at home, they are likely to suffer negative effects on their dental health.<sup>5</sup>

A number of factors have been found to be related with dental fear and anxiety (DFA) psychosocial, behavioural, socio-demographic, and genetic. It is found that adults have often already acquired dental anxiety from childhood. Painful and unpleasant stimuli associated with dental treatment may lead to the development of DFA. However, among children with comparable dental history, some have DFA, while others do not. Thus, it has been opined that discrepancy between previous dental experiences and onset of anxiety and fears is attributable to differences in child rearing and personality traits.

Self-perceived oral health is predominantly outcome of parental support. Family environment and culture are also directly related with dental phobias, and it has been postulated that family environment is a model for learning that influences development of dental anxiety.<sup>4</sup> An anxious or fearful parent is the source of the child's negative behaviour as children imbibe anxiety when growing among anxious people around. Dental behaviour of children develops under the influence of the parent's attitude:

Parents with high level of anxiety exert a negative influence on their children. The more the parental anxiety, the greater the poor behaviour of a child-patient in the dental clinic. Children with increased behaviour problems are the most difficult to treat. Unfortunately this may lead to symptomatic management by the dentist forced to bypass an ideal treatment plan. These children have also been found to have a high dmft score, a high frequency of missed or cancelled appointments, and to have late symptomatic presentation. The utility and usefulness of dentists is mainly reflected on how successfully they manage their patients, which ultimately involves managing the parent as well.

The key to effective and efficient dental treatment in pediatric patients is the ability to motivate them to cooperate and for the parent to be proactive in terms of compliance and increased urge for dental visits. It is important for dentists to enhance their the ability to assess parental dental anxiety in order to identify those pediatric patients who have to be dispensed with special need with regard to behaviour problems and a higher risk to caries experience. Unfortunately, advances in dental treatment methods, technology and increased knowledge, did not have any impact on the reduction of children's

dental anxiety over the past few decades as shown by various studies conducted in several countries across a wide range of cultures. In particular, dental caries, tooth decay, predominantly affect children and often face them to a variety of stressful dental procedures and experience dental anxiety. Furthermore, dental fear and anxiety in childhood may persist to adulthood and is a significant predictor for avoidance of dental visits in adulthood. This pinpoints childhood as a critical stage for preventing and intercepting dental fear and anxiety, thereby assisting them to protect their oral health and improve their dental practices.

Hence, a study was carried out to assess the anxiety levels of mothers visiting various dental clinics and to evaluate the association between maternal dental anxieties with their children's dental caries.

## METHODS

A study was carried out in various Private dental clinics in Srinagar, Kashmir for a period of 4 months. 200 mother-child pairs were selected for the study. To assess the dental anxiety level of mothers, Modified Dental Anxiety Scale (MDAS) {Urdu version} was used. It is a five-item questionnaire developed by the modification of Corah's Dental Anxiety Scale (DAS).<sup>5</sup> All the mothers (patients) who were mentally sound and were willing to participate were included in the study.

The questions included in the MDAS questionnaire asked about the feeling of patients (mothers) while their teeth were being drilled or scaled/polished and while the local anesthesia was injected into their gums. A five point Likert scale was used to record the responses for the questionnaire. The scoring ranged from 5 to 25 with each item's score ranging from 1 to 5 as follows: Not anxious (1), Slightly anxious (2), Fairly anxious (3), Very anxious (4) & Extremely anxious (5). The demographic data of mothers like their education levels and family income were also recorded. Oral examination of the respective children was clinically done to record their DMFT/dmft using the World Health Organization (WHO) criteria (6). Children undergoing orthodontic treatment were excluded from the study. The data thus obtained was put to statistical analysis.

## RESULTS

54% of the mothers were either graduates or had postgraduate education. Only 13% of mothers did not have any dental anxiety and 33% were slightly anxious. A significant percentage (87%) was either 'fairly anxious' or 'very anxious' (Table 1).

The caries experience (mean dmft/DMFT of children with highly anxious mothers was higher than those with less anxious and non-anxious mothers. The children whose mothers were 'extremely anxious' (phobic) had the highest mean dmft/DMFT (4.06±1.99) while the

mean DMFT was least (1.03±2.01) among those children whose mothers were non-anxious. The difference was found to be statistically significant (p<0.05) (Table 2).

**Table 1: Demographic characteristics of the study subjects.**

Sample characteristics	Frequency (%)
<b>Age of the children (in years)</b>	
3-6	47 (23.5%)
7-10	86 (43%)
11-15	67 (33.5%)
<b>Mother's education</b>	
<Graduate	92 (46%)
Graduate	63 (32.5%)
Post graduate	45 (22.2%)
<b>Family Income</b>	
<50000	88 (44%)
50000-100000	73 (36.5%)
>100000	49 (24.5%)
<b>Mothers' MDAS (Modified dental anxiety scale)</b>	
Not Anxious	26 (13.0%)
Slightly Anxious	66 (33.0%)
Fairly anxious	75 (37.5%)
Very anxious	24 (12.0%)
Phobic	9 (4.5%)
Total	200

**Table 2: Mothers' anxiety level and their children's caries experience DMFT/dmft=decayed, missing and filled permanent teeth.**

MDAS	Decayed (D) teeth	Missing (M) teeth	Filled (F) teeth	Mean DMFT
Not Anxious	0.66±0.72	0.29±0.67	0.88±1.07	1.03± 2.01
Slightly Anxious	0.89±1.28	0.10±0.32	0.12±0.29	1.11± 1.68
Fairly Anxious	0.91±1.30	0.23±0.49	0.36±0.91	1.5 ± 1.69
Very Anxious	2.09±2.22	0.52±0.49	0.88±1.56	3.49 ± 3.09
Phobic	2.18±1.19	0.81±1.11	1.07±1.52	4.06 ± 1.99
p-value	0.00*	0.001*	0.00*	0.001*

At significance; p<0.05

Misbehaviour may stem from the family unit via behaviour contagion.<sup>8</sup> Parental behaviour towards oral health may be considered a modeling process in which children imitate adult models. Self-perceived oral health has been significantly associated with parental support. Family environment and culture have been associated with dental phobias.<sup>9</sup>

In the present study, Modified Dental Anxiety Scale (MDAS) was used to measure the dental anxiety of mothers as it is a valid and reliable tool used widely in clinical practice as well as in research. It was developed by the modification of Corah's Dental Anxiety Scale

## DISCUSSION

Dental treatment phobia is a fear traditionally defined as an irrational and exaggerated fear of dentists and dental procedures. It has also been referred to as odontophobia, dentophobia, dentist phobia or dental anxiety. Dental anxiety can prevent patients from cooperating fully during dental treatment. Moreover, anxious people tend to overestimate pain and discomfort caused by dental treatment and may also postpone or miss appointments, with negative consequences for their oral health and often having to incur more complex interventions, thereby entering a vicious cycle that tends to intensify anxiety with regard to treatment.

Reasons for the development of dental anxiety are still undefined. However, three main aspects have been suggested: (i) direct conditioning, which originates in early, aversive encounters in the dental office (ii) vicarious learning, through role models, such as family, peers and society and (iii) psychodynamic and personality aspects, i.e. specific traits that when present, increase the patient's proneness for apprehension in the dental setting.<sup>7</sup> Anxiety in parents, especially excessively involved mothers, have been shown to be associated with anxiety being reflected in the children. The common cause of poor behaviour in the dental clinic is usually dental anxiety. Incorporation of attitudes and behaviour patterns from parents and siblings is common.

(DAS). In the present study, it was found that only 13% of mothers were non-anxious, rest (majority) had some level of dental anxiety ranging from slightly anxious to phobic. Mean DMFT was highest (4.06±1.99) among those children whose mothers had extreme dental anxiety; while the mean DMFT was least (1.03±2.01) among those children whose mothers were non-anxious.

This finding corroborates with previous studies wherein they found a significant correlation between Parental dental fear and behaviour of their children.<sup>10,11</sup> Moreover, it was found in many previous studies.<sup>12,13</sup> that dental caries of children was associated with parental dental

anxiety similarly as exhibited in the present study. This might be due to the fact that parents who avoid seeking dental treatment themselves; are also likely not to take their children for dental treatment.<sup>14</sup>

Fearful parents more often than non-fearful parents assess their child to be fearful regardless of the child's actual fears, and fearful children do not really know the dental fear of their parents.<sup>15</sup>

It seems that health habits and health behaviour 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 behaviour patterns of their parents.<sup>16,17</sup>

Mothers, especially, have been shown to have the most influence on a child's behaviour and psychological development. Depending on the mother's previous dental experience, her attitude and anxiety levels have been shown to have a direct influence on the child's attitude and anxiety levels.

A mother who bears anxiety as a result of her own previous dental experience will transmit to her offspring which will produce a dental phobia towards dental treatment with a child having his/her own preconceived misconceptions.<sup>18</sup> Therefore; parental anxiety affects the behaviour of the child during dental treatment and ability of the child to cope.<sup>19</sup>

### **Limitations**

The present study could not find the association of various factors like mother's qualification, family income with their dental anxiety levels. The convenient sampling technique and the small sample size might restrict the application of the results on larger population. The dietary habits and oral hygiene habits of the children could not be assessed.

### **CONCLUSION**

It was concluded that occurrence of dental caries was more in children of highly anxious mother's and hence there exists the association between the mother's dental anxiety and their children's dental caries prevalence.

### **Recommendations**

Proper dental health education, good patient-dentist relationship, regular dental visits and effective communication with mothers would help in reducing their dental anxiety. This will not only improve oral health care of the mothers but in turn will translate into better utilization of preventive and restorative dental services for their children.

Dentists need to understand the anxiety and its repercussions in dental care and need to know how to

identify behaviour that indicates anxiety so that a relationship of trust may be established with the patient for the implementation of strategies aimed at minimizing the anxiety caused by dental treatment. Strategies like more dental training on the management of dental anxiety in patients especially children is required for the assessment, prevention and control of dental anxiety to allow better utilization of health services by children, adolescents and their parents.

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**Annexure**

**Modified Dental Anxiety Scale (MDAS)**

**CAN YOU TELL US HOW ANXIOUS YOU GET, IF AT ALL,  
WITH YOUR DENTAL VISIT?**

**PLEASE INDICATE BY INSERTING 'X' IN THE APPROPRIATE BOX**

**1. If you went to your Dentist for TREATMENT TOMORROW, how would you feel?**

Not Anxious       Slightly Anxious       Fairly Anxious       Very Anxious       Extremely Anxious

**2. If you were sitting in the WAITING ROOM (waiting for treatment), how would you feel?**

Not Anxious       Slightly Anxious       Fairly Anxious       Very Anxious       Extremely Anxious

**3. If you were about to have a TOOTH DRILLED, how would you feel?**

Not Anxious       Slightly Anxious       Fairly Anxious       Very Anxious       Extremely Anxious

**4. If you were about to have your TEETH SCALED AND POLISHED, how would you feel?**

Not Anxious       Slightly Anxious       Fairly Anxious       Very Anxious       Extremely Anxious

**5. If you were about to have a LOCAL ANAESTHETIC INJECTION in your gum, above an upper back tooth, how would you feel?**

Not Anxious       Slightly Anxious       Fairly Anxious       Very Anxious       Extremely Anxious

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**Instructions for scoring (remove this section below before copying for use with patients)**

*The Modified Dental Anxiety Scale.* Each item scored as follows: Not anxious =1; Slightly anxious= 2; Fairly anxious = 3; Very anxious = 4; Extremely anxious = 5.

Total score is a sum of all five items, range 5 to 25: Cut off is 19 or above which indicates a highly dentally anxious patient, possibly dentally phobic