

## The relationship between maternal dental anxiety and children's dental anxiety: a cross-sectional study

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### Abstract:

**Background and aim of the study:** Dental fear and anxiety are one of the main challenges in pediatric dentistry, and dental fear and anxiety are a common reason for avoiding dental treatments, which may lead to deterioration of oral health status over time. Many researchers have shown that the relationship between parents and children has a direct impact on dental anxiety in children, so this study was conducted with the aim of evaluating the relationship between dental anxiety in mothers and dental anxiety in children.

**Materials and methods:** This cross-sectional study was conducted on 60 children and their mothers who attended the Department of Pediatric Dentistry at Damascus University. The children's aged ranged 6 to 12 years. Demographic data were collected included child's age, mother's age, child's gender, and mother's education level. Dental anxiety in children was assessed using the Facial Image Scale, and dental anxiety in mothers was assessed using the Modified Dental Anxiety Scale.

Data were analyzed using SPSS version 24 at a significance level of 0.05.

**Results:** Spearman's rho showed no correlation between dental anxiety in children and both the child's age and the mother's age ( $P > 0.05$ ). Chi-square test results also showed no correlation between gender and dental anxiety in children ( $P > 0.05$ ). Spearman's rho showed a statistically significant relationship between dental anxiety in mothers and dental anxiety in their children ( $P < 0.05$ ).

**Conclusions:** There is an association between dental anxiety in mothers and dental anxiety in children, and therefore more attention should be paid to the role of mothers in preparing the child for dental visits.

**Keywords:** Dental Anxiety, Dental Fear, Pediatric Dentistry.

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## العلاقة بين القلق السنّي لدى الأمهات والقلق السنّي لدى الأطفال: دراسة مقطعية

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### الملخص:

خلفية البحث والهدف منه: يعدّ الخوف و القلق السنّي أحد التحديات الرئيسية في طب أسنان الأطفال ، كما أن الخوف والقلق السنّي سبب شائع لتجنب المعالجات السنّية والذي قد يؤدي مع مرور الوقت إلى تدهور الحالة الصحية الفموية . أوضح العديد من الباحثين أن العلاقة بين الوالدين والطفل لها تأثير مباشر على القلق السنّي لدى الطفل، لذلك تم إجراء الدراسة الحالية بهدف تقييم العلاقة بين القلق السنّي لدى الأمهات والقلق السنّي لدى الأطفال.

المواد والطرائق: أجريت هذه الدراسة المقطعية على 60 طفلاً وأمّهاتهم من مراجعي قسم طب أسنان الأطفال في جامعة دمشق. تراوحت أعمار الأطفال بين 6-12 سنة. تم جمع البيانات الديموغرافية من عمر الطفل، عمر الأم، جنس الطفل، مستوى تعليم الأم. تم تقييم القلق السنّي لدى الأطفال باستخدام مقياس Facial Image Scale ، وتم تقييم القلق السنّي لدى الأمهات باستخدام مقياس Modified Dental Anxiety Scale . تم تحليل البيانات باستخدام SPSS إصدار 24 عند مستوى الدلالة 0.05 .

النتائج: أظهر اختبار معامل الارتباط سبيرمان عدم وجود ارتباط بين القلق السنّي لدى الطفل وكلاً من عمر الطفل وعمر الأم ( $P\text{-value} < 0.05$ ) وأظهرت نتائج اختبار كاي مربع أيضاً عدم وجود ارتباط بين الجنس و القلق السنّي لدى الطفل ( $P\text{-value} < 0.05$ ). لدى الأمهات والقلق السنّي لدى الأطفال ( $P\text{-value} > 0.05$ ).

الاستنتاجات: هناك ارتباط بين القلق السنّي لدى الأمهات والقلق السنّي لدى الأطفال، وبالتالي يجب توجيه المزيد من الاهتمام نحو دور الأم في إعداد الطفل للزيارة السنّية. الكلمات المفتاحية: القلق السنّي، الخوف السنّي، طب أسنان الأطفال

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## Introduction:

"Dental fear" and "Anxiety" present significant challenges in pediatric dentistry (1). These feelings are also common reasons for avoiding dental treatments, which can result in poor oral health over time (2). Although the terms "fear" and "anxiety" are often used interchangeably and are closely related, there are important distinctions between them. Anxiety typically refers to an emotional state that occurs before a fearful encounter, while fear is a real response to an actual threat or situation. For instance, dental fear arises in response to specific threats, such as receiving an injection of anesthesia or hearing the sounds associated with dental procedures. In contrast, anxiety may stem from a vague or unclear source that may or may not exist (3, 4).

Dental anxiety can manifest either as a normal emotional response or as a specific psychological condition. It's essential for dentists to differentiate between dental anxiety and other psychological disorders, such as general anxiety or trait anxiety (5,6).

The development of dental fear and anxiety in children is complex and multifactorial, influenced by personal and environmental factors (7). Significant psychological factors

The sample size was determined via G-power 3.1.9.4 software, with a confidence level of 95% and a significance level of 0.05.

Informed consent was obtained from the mothers after a clear explanation of the study and its objective was provided. The inclusion criteria included children aged 6 to 12 years without previous dental experience who displayed negative or definitely negative behavior according to the Frankl behavior rating scale. The exclusion criteria included children with general health problems, limited communication ability, previous dental experience, or acute tooth pain. Children whose mothers declined to participate in the study were also excluded.

## Methodology

After obtaining informed consent from the mother, the researcher interviewed the child to assess their behavior using the Frankl Behavior Scale. Additionally, anxiety level was evaluated using the Facial Image Scale. The dental anxiety levels of mothers were evaluated using a Modified Dental Anxiety Scale.

## Measures Used

have been identified, including shyness, general fear, immaturity, cognitive ability, and the transfer of negative experiences from parents or others. Cultural influences also play a role in this development (8,9).

Dental anxiety can develop through cognitive processes and by exposure to negative attitudes from parents or other adults (10,11). The attitudes of parents have a significant impact on children's dental anxiety, as children often learn behaviors from their parents that shape their perceptions and reactions to dental care (9).

Mothers, as primary caregivers, are often the main sources from whom children learn dental fear and anxiety. Several studies have indicated a connection between the dental fear and anxiety experienced by parents and that of their children (12, 13).

## Materials and Methods:

### Study Design

This study was designed as a cross-sectional study that aimed to assess the relationship between maternal dental anxiety and children's dental anxiety. All methods were carried out in accordance with all relevant guidelines, regulations, and the Declaration of Helsinki.

### Sampling population

The sample consisted of 60 aged between 6-12 years along with their mothers who attended the Department of Pediatric Dentistry at Damascus University.

### Facial Image Scale

The Facial Image Scale is commonly employed to evaluate anxiety levels. It features five expressive faces, ranging from a very happy face that indicates no anxiety to a very sad face that represents extreme anxiety (14).

### Modified Dental Anxiety Scale

The scale consists of five questions, each with five response options: 1 - not anxious, 2 - slightly anxious, 3 - somewhat anxious, 4 - very anxious, and 5 - extremely anxious. The total score can range from 5 to 25. A total score of 5 to 10 indicates mild dental anxiety, a score of 11 to 18 suggests moderate dental anxiety, and a score greater than 19 indicates severe dental anxiety and possible dental phobia (15).

### Frankl Behavior Rating Scale

The Frankl scale categorizes the child's behavior in the dental clinic into 4 categories starting from rating 1 (definitely negative) to rating 4 (definitely positive) as follow:

- Rating 1: DEFINITELY NEGATIVE: refusal of treatment, crying forcefully, fearful, or any other overt evidence of extreme negativism.
- Rating 2: NEGATIVE: reluctant to accept treatment, uncooperative, some evidence of
- Rating 4: DEFINITELY Positive: good rapport with the dentist, interested in the dental procedure, laughing and enjoying the situation (16).

**Statistical analysis**

The data were analyzed via SPSS version 24, with the significance level set at 0.05

**Results:**

A total of 60 children (31 girls and 29 boys) were examined in the present study.

The children's ages ranged from 6-12 years, whereas the mothers' ages ranged from 23-50 years (Table 1).

The reliability test for the Modified Dental Anxiety Scale was conducted using the Cronbach's Alpha coefficient. This coefficient ranges from 0 to 1, and for the scale to be considered reliable, the minimum acceptable value must be 0.60 or higher.

Table 2 shows that the value of the Cronbach's alpha coefficient is greater than the minimum acceptable limit (0.60), which indicates that all the statements achieve internal consistency with

negative attitude but not pronounced i.e. sullen, withdrawn.

•Rating 3: POSITIVE: acceptance of treatment; at times caution. Willingness to comply with dentist, at time with reservation but patient follows the dentist's direction cooperatively. their dependent dimensions. This indicates that the scale enjoys a high degree of reliability and can be relied upon in the field application of the study.

The table 3 shows that 40% of the mothers had severe anxiety while 55% had moderate anxiety. The results presented in Table 4 indicate that Spearman's rho showed no correlation between the child's age and his anxiety levels, and no correlation was found between the mothers' age and the child's anxiety (P <0.05).

There was no correlation between gender and the child's level of anxiety, as the chi-square test revealed no statistically significant difference (P <0.05) (Table5).

The results presented in Table 6 indicate that Spearman's rho showed a significant correlation between the mother anxiety and child anxiety (P <0.05).

**Table (1): Descriptive statistics of the sample**

	n	minimum	maximum	mean	sd*
children age	60	6	12	7.42	1.418
mother age	60	23	55	34.83	7.316

\* Standard Deviation /N: number of children

**Table (2): Cronbach's Alpha for Modified dental anxiety scale**

Modified dental anxiety scale	Number of phrases	Cronbach's Alpha
	5	0.82

**Table (3): Descriptive statistics of the maternal dental anxiety**

*MDAS	Frequency	% Percent
Mild Anxiety	3	5.0
Moderate anxiety	33	55.0
sever anxiety	24	40.0
Total	60	100.0

\*MDAS (Modified Dental Anxiety Scale)

**Table (4): Spearman's rho was used to study the relationship between child age and mothers' age and between child anxiety.**

		child anxiety	
		Spearman's rho	children age
<i>P</i> value	.493		
N	60		
mother age	Correlation Coefficient		-.022
	<i>p</i> value		.867
	N		60

N: number of children.

**Table(5): Chi-square test was used to study the correlation between gender and the child's level of anxiety.**

		child anxiety				Total	Chi-Square	<i>P</i> -value
		happy	Neutral	Sad	very sad			
Gender	Male	2	4	2	21	29	1.89	.593
	Female	1	6	3	21			
Total		3	10	5	42	60		

**Table(6): Spearman's rho was used to study the relationship between mother anxiety and child anxiety.**

		Child anxiety		
		Spearman's rho	Mother anxiety	Correlation Coefficient
<i>p</i> -value	.			.001*
N	60			60

\*Significant difference at ( $P < 0.05$ ).

**Discussion:**

Managing dental anxiety and fear is a crucial aspect of pediatric dental care (17,18). Both dentists and patients face challenges in addressing dental anxiety, particularly in pediatric patients who often lack maturity and cognitive abilities (19).

Misinformation about dental treatments within the community (spread by parents, family members, peers, teachers, television, and social media) creates a daunting image of dental clinics for children, contributing to their fear and anxiety. In such cases, mothers, as primary caregivers, are particularly influential in transmitting dental anxiety and fear to their children (20,21).

children aged 6 to 12 Years were included in this study, as this age group exhibits high rates of dental anxiety according to a systematic review conducted by Grisolia and colleagues (22). Additionally children over the age of six can reliably articulate their anxiety and fear, and they possess a better ability to understand and express their emotions compared to younger children (23).

Various tools are available to assess dental anxiety, including clinical observations of

children's behavioral responses in the dental environment, self-report measures completed by the children, and questionnaires delivered to parents to evaluate the children's anxiety (24). Self-report anxiety measures are among the simplest and most frequently used methods; they typically involve asking the child about their feelings and can include both verbal measures and photographic tools featuring drawings that allow children to express their emotions (25). The facial image scale was utilized in the study as a self-reported tool that is straightforward and accessible for children of various ages, particularly younger ones, due to its simplicity and time-efficient nature (26,27). The Modified Dental Anxiety Scale (MDAS) was utilized to assess anxiety in mother that provides a quick, reliable and robust measure to assess dental anxiety in adults. This five-point scale has specific items relating to different aspects of dental treatment; ranging from 5 to 25, scores 5-10 are mild, 10-18 are moderate, whilst scores of >19 or more are considered to be severely anxious/phobic of dental treatment (15).

The results of this study indicated a relationship between a child's age and their anxiety levels, which aligns with the study conducted by Alsaadoon and colleagues, who also found that reported that younger children exhibited greater dental anxiety (11). Additionally, a systematic review by Sun and colleagues in 2024 highlighted that the prevalence of dental fear and anxiety was higher among preschool-age children (29).

These discrepancies may be due to variances in health care and cultural environments, as well as other unexamined factors such as prior dental experiences or the reasons behind dental check-ups. Furthermore, there were no differences in anxiety levels between males and females, which agrees with the study performed by Oliveira and colleagues, who indicated no statistically significant differences in dental anxiety between sexes, with similar levels observed in both males and females (30). This lack of difference can be attributed to the fact that dental anxiety is not directly related to gender. Instead, it has multiple causes, including the patient's previous expectations of the dental environment and their individual characteristics, which encompass various mental and emotional traits shaped by their socio-cultural backgrounds.

In contrast, the results of this study differed from those of Dewi, Rath and colleagues, and Agrawal, who found that females exhibited higher levels of dental anxiety compared to males (31, 32,33), these differences may be related to the societal context in which the studies were conducted, as well as cultural variations and the ways in which males and females express their feelings of anxiety, parenting styles, and the age groups investigated.

This study indicated a statistically significant relationship between maternal dental anxiety and child dental anxiety, whereas maternal anxiety often influences children's anxiety levels during dental visits, leading to increased anxiety in children, which can negatively affect their dental experiences and oral health. This highlights the importance of considering

age was not related to dental anxiety (28). However, it contrasts with the findings of Dahlander and colleagues, who

maternal anxiety levels when planning behavioral adjustments and treatments for children. These findings align with Busato et al. (34), who discovered that 81.3% of children in their study experienced anxiety linked to their mothers' anxiety levels. Similarly, Col and Celenk found that children with parents suffering from dental anxiety exhibited higher levels of dental anxiety themselves (35).

The family serves as a vital link between the child and the outside world, playing a significant role in preparing children for experiences beyond the home (36). Negative dental experiences of parents can adversely affect their children's attitudes and behaviors in the dental clinic, leading to increased fear and anxiety about dental treatments (37).

Moreover, inadequate parental practices may contribute to behavioral problems in children, as self-regulation skills develop through the interaction between a child's biological traits and their social environment (38). The parent-child relationship is particularly important; as children often model parents' behaviors, and over time, reinforcing negative behaviors can lead to the transfer of anxiety and fear from parents to children (39,40).

However, the results of this study contrast with those of Mercado and Saez, who evaluated the relationship between dental anxiety levels in children aged 7-10 years and their parents, they reported no statistically significant difference between parental and child anxiety levels (41).

### **Conclusions:**

Within the limits of this study, we conclude that there is a relationship between dental anxiety in mothers and dental anxiety in children, which in turn negatively affects the child's behavior during dental treatment. Therefore, more attention should be directed towards educating mothers and their role in preparing the child for the dental visit.

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