EGYPTIAN DENTAL JOURNAL
www.eda-egypt.org
VOL. 71, 2783:2789, OCTOBER, 2025
PRINT ISSN 0070-9484 • ONLINE ISSN 2090-2360
ORTHODONTICS, PEDIATRIC AND PREVENTIVE DENTISTRY
Submit Date : 16-06-2025 • Accept Date : 17-07-2025 • Available online: 01-10-2025 • DOI : 10.21608/edj.2025.394623.3508

THE ASSOCIATION BETWEEN PARENTAL ANXIETY AND CHILD BEHAVIOUR DURING SIMPLE RESTORATIVE TREATMENT: A CROSS-SECTIONAL STUDY

Farah Magdy Ramsis Guirgis*, Sara Ahmed Mahmoud** *and* Maii Mohamed Ali***

ABSTRACT

Aim: This study was carried out to identify the prevalence of parental anxiety, identify the prevalence of child anxiety, and assess the association between parental anxiety and child behavior during simple restorative treatment.

Subjects and methods: In this cross-sectional study, a validated questionnaire was used to examine the correlation between parental anxiety and child behavior during simple restorative treatment for 158 children aged 4 to 6 years old at their first dental appointment. The parental anxiety was evaluated with the Modified Dental Anxiety Scale. The child anxiety was examined using the Modified Venham Picture Test. The child behavior was documented after the treatment using the Venham Behavior Rating Scale.

Results: The prevalence of parental anxiety was 41.77% (n = 66), and the prevalence of child anxiety was 77.22% (n = 122). There was no statistically significant relation between parental anxiety, child anxiety, and child behavior during simple restorative treatment.

Conclusion: Parental anxiety exists among the included sample. Low level of dental anxiety is prevalent among children aged 4 to 6. There was no correlation between parental anxiety and a child's dental anxiety, as well as no correlation between parental anxiety and child's behavior during dental care.

KEYWORDS: Child Anxiety, Parental anxiety, Child Behavior, Simple restorative treatment.

* B.D.S, Faculty of Dentistry, Cairo University, Giza, Egypt.
** Professor of Pediatric Dentistry and Dental Public Health, Faculty of Dentistry, Cairo University.
*** Lecturer of Pediatric Dentistry and Dental Public Health, Faculty of Dentistry, Cairo University.

INTRODUCTION

Anxiety is an emotional condition that occurs before to the actual encounter with frightening stimuli, which may often be unidentifiable. It is typically encountered in everyday life, such as during examinations and several other situations. (AAPD, 2023).

Even with advances in dental technology, dental procedures can still cause anxiety in both children and their parents, potentially resulting in the avoidance of dental appointments. Anxiety may also be the cause of bad behavior during dental treatment and is thus considered a risk factor for oral disorders (Fux-Noy et al., 2023).

Research indicates that parents who exhibit anxiety over dental treatments correlate with elevated caries incidence in their children, since they tend to be resistant to accompanying their children to the dentist (Zinke et al., 2018) (Alhareky et al., 2021) (Jervøe-Storm et al., 2023).

People exhibiting significant dental anxiety, including both children and their parents, can pose challenges in treatment, prolong procedures, and display behavioral disorders. As a result, both the patient and the dental professional may endure a challenging and distressing experience (Winkler et al., 2023).

Refer to the limited studies conducted in Egypt about the correlation between parental anxiety and child behavior during dental appointments. Accordingly, the study sought to characterize behavioral responses in children undergoing their first dental procedure and to assess the association between these behaviors and anxiety levels observed in both the pediatric patients and their parents. Therefore, this study was conducted to cover this gaped knowledge and to assist dental practitioners in developing a suitable management strategy in the future.

SUBJECTS AND METHODS

Sample size calculation

Sample size calculation was conducted with Epi Info for Windows version 7.2 (Dean et al., 2011). According to the results of a previous study (Filho et al., 2018) in which the prevalence of parental anxiety was 88.4%, The anticipated sample size (n) was 158 cases, based on a 95% confidence interval and a 5% margin of error, incorporating finite population correction.

Eligibility criteria

The principal investigator evaluated children presenting with simple occlusal carious cavities at the outpatient diagnostic clinic of the Pediatric Dentistry and Dental Public Health Department, Faculty of Dentistry, Cairo University, during their initial dental visit accompanied by a parent, to ensure that all participants met the study's eligibility criteria.

Settings

In this study, 158 children aged from 4 to 6 years, each accompanied by one parent, were recruited for participation in this study. The study excluded children who were medically compromised, presented to the diagnosis clinic with a dental emergency, did not have the cognitive capacity to respond to the anxiety test, or whose parents declined to participate in the research.

"The study protocol was reviewed and approved in 2022 by the Ethical Committee of the Faculty of Dentistry, Cairo University (Approval ID: 11-5-22), in accordance with established scientific standards and ethical regulations governing research involving human subjects. This study was registered on clinicaltrials.gov under the title "The Association between Parental Anxiety and Child Behavior during Simple Restorative Treatment: A Cross-Sectional Study" with identifier NCT05217225

This was a questionnaire-based cross-sectional study in which the parents answered the validated Arabic version of the MDAS (Humphris et al.,1995) (Bahammam, 2016), and the child answered the Modified Venham picture test at the reception area without any guidance from the principal investigator to assess their dental anxiety level. While all dental treatments were conducted at the postgraduate clinics of the Pediatric Dentistry and Dental Public Health Department, Faculty of Dentistry, Cairo University.

Dental treatment was performed in the presence of parents to provide a sense of security for the child. However, the parents were clearly instructed not to interfere in any way, either vocally or by their actions

The whole procedure was clarified to the child utilizing the tell, show, do approach, wherein verbal explanations of processes were provided using uncomplicated language.

All the procedure was done without the use of local anesthesia (Jain et al., 2020), The tooth was isolated using cotton rolls and a saliva ejector to maintain a dry working field, and the caries was removed using a small round bur (Jain et al., 2020). The tooth was then etched for 20 seconds, rinsed, and dried until the chalky white appearance of enamel was observed. After etching, 2 separate coats of bonding agent were applied to the tooth surface with a microbrush, and then the cavity was scrubbed for 10–15 seconds per coat without light curing between the coats. The excess solvent was then evaporated by air drying with an air syringe for at least 10 seconds until there was no visible movement of the adhesive, then light-cured using a dental curing light for 10 seconds (the procedure is done according to the manufacturer's Instructions). The flowable composite was utilized for the restoration of cavities confined to the enamel layer, while the packable resin composite was employed for the restoration of cavities that extend into the dentin layer.

The child's behavior was assessed during the whole treatment by two assessors: the principal investigator (F.G.), who did it after treatment was done and recorded it in the patient assessment chart, and the assistant supervisor (M.A.), who saw the video that was recorded for the treatment process using Venham Behavioral Rating scale.

Bias

To minimize selection bias, all children who met the inclusion criteria and were present on the designated examination days were enrolled in the study. To prevent any reporting bias, all outcomes were reported in the patient chart. To avoid any performance bias, standardization of management techniques and treatment types overcame performance bias in patient management and treatment, and all clinical work was done by the same operator (principal investigator). And also, the behavioral evaluation was done by two assessors (principal investigator and assistant supervisor) to avoid any informative bias.

Statistical analysis

Numerical data was examined for normality by examining the data distribution, calculating the mean and median values, and employing the Kolmogorov-Smirnov and Shapiro-Wilk tests. The data was presented as the mean and standard deviation values.

The chi-square test was employed to analyze categorical data, which was represented as frequency (n) and percentage (%). Numerical data was examined for normality by examining the data distribution, calculating the mean and median values, and employing the Kolmogorov-Smirnov and Shapiro-Wilk tests. The analysis employed an independent t-test, and the data was presented as mean and standard deviation values. The data was analyzed using the Mann-Whitney U test when the assumption of normality was found to be violated. These values were presented as the median and

range. The threshold for significance was set at $p < 0.05$ for all data analyses. IBM® SPSS® Statistics Version 26 for Windows was employed to conduct the statistical analysis.

RESULTS

The study was conducted on 158 children, with a mean age of (5.04±0.70) years, 69 of whom were males and 89 females.

The mean age of the parents (was 33.25±7.55) years, and the majority were females, not working, and with a tertiary educational level.

The majority of the tested children were anxious with low anxiety levels 66 (41.77%).

There were comparable results regarding parental anxiety between the anxious 92 (58.23%) and the non-anxious 66 (41.77%) parents.

The majority of children had a zero score according to VBRS with Mean±SD 1.08±1.75 and Median (IQR) 0.00 (2.00).

There was no statistically significant association between parental anxiety, child anxiety, and child behavior ($p > 0.05$).

TABLE (1) Percentage of children's anxiety.

Parameter		Value
Children's anxiety [n (%)]	**Anxiety free**	**36 (22.78%)**
	Low anxiety	**66 (41.77%)**
	Intermediate anxiety	**43 (27.22%)**
	High Anxiety	**13 (8.23%)**

TABLE (2) Percentage of parents' anxiety.

Parameter		Value
Parents' anxiety [n (%)]	**Non-anxious**	**92 (58.23%)**
	Anxious	**66 (41.77%)**

TABLE (3). Percentage of children's behavior scores.

Children's behavior score	n (%)
0	102 (64.56%)
1	15 (9.49%)
2	11 (6.96%)
3	5 (3.16%)
4	7 (4.43%)
5	18 (11.39%)

TABLE (4). Association between parental anxiety, children's behavior score and children's anxiety.

Parameter		Parental anxiety		p-value
		Non-anxious	Anxious	
Children's behavior score	**Mean±SD**	1.08±1.79	1.08±1.71	**0.739ns**
	Median (IQR)	0.00 (2.00)	0.00 (1.75)	
Children's Anxiety	**Anxiety free**	21 (58.33%)	15 (41.67%)	**0.857ns**
	Low anxiety	37 (56.06%)	29 (43.94%)	
	Intermediate anxiety	25 (58.14%)	18 (41.86%)	
	High Anxiety	9 (69.23%)	4 (30.77%)	

; significant (p<0.05), ns; non-significant (p>0.05).

DISCUSSION

Assessing the child's behavior and the variables influencing it enables the dentist to formulate a behavior-guiding strategy to achieve the required oral healthcare. Additionally, it helps the dentist identify the most efficient behavioral approach to use (AAPD, 2021).

This study took to assess the association of parental anxiety, child anxiety, and child behavior

in children aged 4 to 6 years during dental visits, as there is presently inadequate evidence to establish a definitive relationship between parental anxiety and child behavior in the setting of dental care..

A cross-sectional study was chosen to address the subject of parental anxiety and child anxiety and their association with child behavior during the dental procedure. The latter possesses the benefits of being relatively rapid, uncomplicated, effortless, cost-effective, and the most appropriate research strategy for addressing concerns regarding prevalence. Additionally, it has the capability to analyze relationships between numerous exposures and outcomes (Capili 2021).

The present study revealed the children's total dental anxiety (DA) level (77.22%) stemmed from their apprehension about the unknowns associated with dental treatment, this anxiety included concerns about bleeding, gagging, criticism, or needles, the noise from dental instruments, and the unpleasant experiences of previous dental visits for any of their siblings. The DA prevalence is almost similar to that reported by (Saraf et al., 2022). However, other studies revealed a lower prevalence of the DA (Filho et al. 2018) (Grisolia et al. 2021) (Sun et al. 2024). This finding can be attributed to the variation in the outcomes due to the fact that not all measuring devices used to evaluate dental anxiety in children target the same underlying principle. Furthermore, the criteria used to distinguish children with and without dental anxiety are sometimes established arbitrarily, resulting in variations in the reported incidence of dental anxiety across various research studies.

The results of the parental anxiety questionnaire were comparable, with 58% of the individuals identified as non-anxious, and most of them are mothers. This may be attributed to their positive experiences or attitudes towards dental visits. It is important to mention that the study took place in a university clinic where dental services were offered at no cost, which might have potentially decreased levels of anxiety. Additionally, the parents answered the questionnaire autonomously, which may have posed difficulties for them in correctly comprehending and answering the questions, which may affect the results positively or negatively. This finding aligns with a previous study (Pantoja et al., 2018); however, other studies have found a higher percentage of anxiety in mothers, such as (Esa et al., 2020) (Alhareky et al., 2021). The majority of the children had a zero-behavior score (64.56%) with mean of 1.08±1. 75, which is similar to (Pantoja et al., 2018) and (Anwar et al., 2022), this can be due to the proper behavioral management protocol and the pain-free procedure that was established in the first dental visit.

The current study found that there was no statistically significant relationship between child anxiety and behavior score, which is the same as (Pezzini Soares et al., 2019), and against the results of (Filho et al. (2018) (Duker et al., 2022). This may be due to the individual differences in how children express their anxiety and behave during dental visits. These findings may be influenced by a variety of factors, including the management techniques used during dental procedures, the type of procedure, psychological maturation, and individual differences in coping mechanisms.

There was no statistically significant relationship between child anxiety, child behavior, and parental anxiety as found in other studies (Folayan et al., 2002) (Vasiliki et al., 2016) (Pantoja et al., 2018). This enhances the understanding of the correlation between parents' performance and the development of children's anxiety in the context of dental treatment. The findings demonstrated that parents do not transmit their dental anxiety to their children (Silva et al., 2017). However, other studies have shown a significant correlation between parental anxiety, particularly maternal anxiety, and child anxiety and behavior (Esa et al., 2020) (Yiğit et al., 2022). Also, maternal anxiety and child anxiety had

a slight positive association in the 4–7 age range (Besiroglu-Turgut et al.,2024). This suggests that the influence of parental anxiety on child behavior and anxiety may vary depending on demographic factors and situational contexts.

Based on the findings of this study, it can be concluded that there is no correlation between child behavior, parental anxiety, and child anxiety levels when children are well-managed and undergoing painless treatment. Emphasizing that effective management techniques are crucial in shaping children's perspectives.

CONCLUSION

Within the limitations of this study, the parental anxiety exists among the included sample, Low level of dental anxiety is prevalent among children aged from 4 and 6 years old, child dental anxiety is more common in boys than girls, with most boys experiencing intermediate and low anxiety, while the majority of girls have either anxiety-free or low levels of anxiety, there is no relationship between parental anxiety and child dental anxiety, there is no relationship between parental anxiety, child anxiety, and child behavior in dental care. And there is an inverse correlation between the child's dental anxiety and behavior score and the child's age.

Conflict of Interest:

The authors verify that there is no conflict of interest.

Funding:

This research did not receive any specific funding from public, commercial, or non-profit agencies.

Ethics:

This study protocol was approved by the ethical committee of the faculty of dentistry-Cairo University on:31 May 2022, approval number:11-5-22.

Data availability:

Data are available to be sent upon request.

Author contribution:

All authors contributed to the study's conception and design, material preparation, data collection, and analysis. All authors read, reviewed, and approved the final manuscript.

REFERENCES

1. Alhareky, M., Nazir, M. A., AlGhamdi, L., Alkadi, M., Al-Beajan, N., AlHossan, M., & AlHumaid, J. (2021). Relationship Between Maternal Dental Anxiety and Children's Dental Caries in the Eastern Province of Saudi Arabia. Clinical, cosmetic and investigational dentistry, 13, 187–194. https://doi.org/10.2147/CCIDE.S310026
2. American Academy of Pediatric Dentistry. (2023). Behavior guidance for the pediatric dental patient. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023: 306-24.
3. Bahammam Alshoraim, M. A., El-Housseiny, A. A., Farsi, N. M., Felemban, O. M., Alamoudi, N. M., & A3landejani, A. A. (2018). Effects of child characteristics and dental history on dental fear: Cross-sectional study. BMC Oral Health, 18(1), 1–9. https://doi.org/10.1186/S12903-018-0496-4 6
4. Besiroglu-Turgut, E., Kayaalti-Yuksek, S., & Bulut, M. (2024). Evaluation of the relationship between dental anxiety and oral health status of mothers and their children. BMC oral health, 24(1), 749. https://doi.org/10.1186/s12903-024-04530-0
5. Capili B. (2021). Cross-Sectional Studies. The American journal of nursing, 121(10), 59–62. https://doi.org/10.1097/01.NAJ.0000794280.73744.fe
6. Dean, A. G., et al. "Epi Info™, a database and statistics program for public health professionals." CDC, Atlanta, GA, USA (2011).
7. Dean, J. A., & McDonald, R. E. (2022). Dentistry for the Child and Adolescent Mental. In McDonald and Avery's.
8. Duker, L. I. S., Grager, M., Giffin, W., Hikita, N., & Polido, J. C. (2022). The Relationship between Dental Fear and Anxiety, General Anxiety/Fear, Sensory Over-Responsivity and Oral Health Behaviors and Outcomes: A Conceptual Model. In International Journal of

Environmental Research and Public Health (Vol. 19, Issue 4). https://doi.org/10.3390/ijerph19042380

9. Esa, R., Jamaludin, M., & Yusof, Z. Y. M. (2020). Impact of maternal and child dental anxiety on oral health-related quality of life of 5-6-year-old preschool children. Health and quality of life outcomes, 18(1), 319. https://doi.org/10.1186/s12955-020-01565-z

10. Filho, J M C V., Clementino, M A., Lima, L C M D., Granville-Garcia, A F., Carvalho, M M P D., & Ferreira, J M S. (2018, December 1). Anxiety of parents and children in dental care. https://doi.org/10.1590/1981-86372018000400053483

11. Folayan, M. O., Adekoya-Sofowora, C. A., Otuyemi, O. D., & Ufomata, D. (2002). Parental anxiety as a possible predisposing factor to child dental anxiety in patients seen in a suburban dental hospital in Nigeria. In International Journal of Paediatric Dentistry (Vol. 12, Issue 4, pp. 255–259). https://doi.org/10.1046/j.1365-263X.2002.00367.x

12. Fux-Noy, A., Zeineh, R., Shmueli, A., Halperson, E., Ram, D., & Moskovitz, M. (2023). Anxiety during the dental care of children aged 4 to 6 years over three consecutive visits. The Journal of clinical pediatric dentistry, 47(6), 100–105. https://doi.org/10.22514/jocpd.2023.084

13. Grisolia, B M., Santos, A P P D., Dhyppolito, I M., Buchanan, H., Hill, K., & Oliveira, B H D. (2020, September 9). Prevalence of dental anxiety in children and adolescents globally: A systematic review with meta-analyses. https://doi.org/10.1111/ipd.12712

14. Humphris, G. M., Morrison, T., & Lindsay, S. J. (1995). The Modified Dental Anxiety Scale: validation and United Kingdom norms. Community dental health, 12(3), 143–150.

15. Jervøe-Storm, P. M., Peters, L. P., Bekes, K., Fricke, M., & Jepsen, S. (2023). Evaluation of Children's Anxiety Level in Relation to a Dental Visit/Treatment and Their Parents' Dental Fear. Journal of clinical medicine, 12(20), 6691. https://doi.org/10.3390/jcm12206691

16. Pantoja, E. R. M., Mattos-Vela, M. A., Ramos, G. T., & Victorio, D. J. B. (2018). Relationship Between Anxiety, Dental Fear of Parents and Collaboration of Children to Dental Treatment. Odovtos-International Journal of Dental Sciences, 20(3), 81-91.Narayan, V K., & Srinivasan, S R. (2020, February 29). Appropriateness of various behavior rating scales used in pediatric dentistry: A Review. https://doi.org/10.15517/ijds.2018.33332

17. Pezzini Soares, J., Cardoso, M., & Bolan, M. (2019). Demystifying behaviour and dental anxiety in schoolchildren during endodontic treatment for primary teeth—controlled clinical trial. In International Journal of Paediatric Dentistry (Vol. 29, Issue 3, pp. 249–256). https://doi.org/10.1111/ipd.12468

18. Soares, F. C., Lima, R. A., Salvador, D. M., de Barros, M. V. G., Dahllöf, G., & Colares, V. (2020). Reciprocal longitudinal relationship between dental fear and oral health in schoolchildren. International journal of paediatric dentistry, 30(3), 286–292. https://doi.org/10.1111/ipd.12598

19. Vasiliki, B., Konstantinos, A., Vassilis, K., Nikolaos, K., van Loveren, C., & Jaap, V. (2016). The effect of parental presence on the child's perception and co-operation during dental treatment. European Archives of Paediatric Dentistry : Official Journal of the European Academy of Paediatric Dentistry, 17(5), 381–386. https://doi.org/10.1007/S40368-016-0241-0

20. Winkler, C. H., Bjelopavlovic, M., Lehmann, K. M., Petrowski, K., Irmscher, L., & Berth, H. (2023). Impact of Dental Anxiety on Dental Care Routine and Oral-Health-Related Quality of Life in a German Adult Population-A Cross-Sectional Study. Journal of clinical medicine, 12(16), 5291. https://doi.org/10.3390/jcm12165291

21. Zinke, A., Hannig, C., & Berth, H. (2018). Comparing oral health in patients with different levels of dental anxiety. Head & Face Medicine, 14(1). https://doi.org/10.1186/S13005-018-0182-4