



Dental Fear and Anxiety in Children: a Review of the Environmental Factors

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Abstract

Dental fear and anxiety are psychological reactions that interfere significantly with daily life. They are problems suffered by many patients worldwide that remain a significant challenge to providing adequate dental care. The multifactorial etiology of children's dental fear and anxiety identifies the influence of many different risk factors in its development.

The aim of this review article is to analyse the scientific literature regarding the different factors associated with dental fear and anxiety in children. Our review of the literature presents a critical analysis of the contributing factors in dental environment that have been investigated in the literature and provides an insight into the possible explanations on the influence of these factors in pediatric patients.

Being familiar with these factors would facilitate behaviour management in anxious children. The findings of the literature review give grounds to undertake studies investigating the influence of contributing factors in all pediatric age subgroups.

Keywords

anxiety, children, dentistry, factors, fear

INTRODUCTION

The multifactorial etiology of children's dental fear and anxiety (DFA) identifies the influence of many different risk factors in its development.¹ Although there is a range of factors, they can be grouped into several general categories – personal (age, gender, general fear, temperament, intellect), social (parental dental anxiety, family social-economic status, pre-appointment preparation by parents and their expectations for children's behaviour in dental environment), and factors of dental environment (factors associated with dental visit, treatment, environment).² This article reviews the contributing factors in dental environment that have been investigated in literature and provides an insight into the possible explanations of the influence of these factors in pediatric patients. They are generally divided into factors associated with the dental visit,

factors associated with dental treatment and factors associated with dental environment.

Dental visit

Age at first dental visit

The child's experience during the first visit to the dentist is essential; it is an important milestone for the child's attitude to dental treatment since it influences considerably the future recall visits. Yet, the effect of the age at the first dental visit on the child's DFA has been comparatively less studied.³ Suprabha et al. found no association between the age at the first dental visit (≤ 5 years old) and dental fear (DF) as well as their current behaviour in the dental clinic.⁴ Later, Paryab et al. confirmed that this factor had no impact on the behaviour of school-aged children in a dental visit.⁵

Previous dental experience and number of dental visits

Generally, inconsistent findings have been reported in the existing scientific literature regarding dental anxiety (DA) and treatment experience. For example, in some studies, patients without DA are reported to have significantly more filled surfaces compared to the ones with anxiety⁶, while in other studies no relationship between DA and the number of fillings in different children age groups was found.^{7,8} A study demonstrates significantly higher mean DAS score (Corah Dental Anxiety Score) among adolescents who had treatment experience in comparison with adolescents with no past dental treatment experience. A possible explanation is associated with the invasive procedures and negative unpleasant experiences in children during their past dental visits.⁹ A prospective study identifies higher levels of DA in children without dental experience.¹⁰ The authors, as well as other researchers, associate DFA with fewer number of dental visits. The “vicious cycle of dental fear” supports this explanation.^{10,11} Reduced number of dental visits leads to deterioration of oral health and results in developing further anxiety disorders over time. In contrast, other studies provide contradictory results, reporting that children with more visits to the dentist demonstrate higher levels of DFA.⁹ In 2011 the results of a cross-sectional questionnaire study show higher levels of DF in children with past dental experience, however, the number of visits to dentists was not associated with DF. Suprabha et al. explain their results with previous stressful invasive dental experience.⁴

Reason for dental visit

The reason for the dental visit has a great impact on the development of DF in children which can continue to function through childhood and into adulthood. Versloot et al. find that previous dental visits are essential for child’s attitude towards dental treatment. Negative experiences of pain and the need for injection of local anesthetic lead to uncooperative behaviour and increase the anxiety on subsequent dental visits.^{8,12} Children with previous aversive dental experience are more likely to be fearful and avoidant than children who do not have these experiences.¹³ Milgrom et al. find that children who reported painful treatment at their last dental visit were 4.9 times less likely to be willing to return to the dentist than those who reported no pain.¹⁴ Ramos-Jorge et al. indicate that children with toothache had higher levels of DA than those that had never experienced toothache.¹⁵ The results are in line with the study of Xia et al. in China who identify that a major risk factor for behaviour management problems was the presence of toothache.¹⁶ Patients who undergo urgent dental care demonstrate higher levels of DFA. The “vicious cycle of dental fear” supports this explanation.¹⁷ In addition, the child’s awareness of the future complex and invasive treatment increases his fear and anxiety. Many studies confirm the statistically significant relationship between the development of DFA and previous invasive dental treatment associated with pain and discomfort.^{17,18} The obtained data exhibit an

essential element in the multifactorial etiology of DF. Thus, authors consider dental visit for symptomatic treatment as a major risk factor for development of DF.

Frequency of dental attendance

Bardy et al. find inverse relationship between frequency of dental attendance and anxiety in children.¹⁹ The results of Armfield et al. and Tickle et al. are in line with the results obtained by Brady et al. that high levels of DA are significantly associated not only with the irregular dental visits, but with the long-time interval between the dental visits.¹¹ The results of a study in Iran demonstrate that 60% of anxious children did not have regular recall dental visits. The authors find that irregular dental attendance increases the experience of pain and more treatment needs and thus indicate it as a risk factor for the child’s DA.⁵ Studies in Europe, Asia and South America also emphasize the importance of regular dental visits.^{20,21}

Time since last dental visit

The relationship between the time of the last dental visit and DFA varies considerably.^{9,11,22} Armfield et al. and Tickle et al. find that children who are sporadic attendees, usually present in pain and therefore often require urgent dental care, report high levels of DA. This pattern of attendance and care can set up a vicious cycle leading to long-lasting DA problems.¹¹ Authors consider that the longer time passed since the last dental visit, the higher risk of oral health deterioration exists. It leads to a greater number of invasive dental procedures, which in turn increases the levels of DA. Brukienė et al. investigate DA in children whose last dental visit was in the last year compared to children with no dental visit within the last year. The data obtained demonstrate that children, who did not visit a dentist in the last year, reported significantly higher DA.⁹

Factors of dental treatment

Lack of control during the dental treatment

Many dentists use a simple signaling system to give control to patients, and this is particularly useful for children as well as for anxious patients.²³ The most frequently used signal is a raised hand to notify the dentist that the patient would like to stop the procedure. Weinstein considers that it is a key component of building communication and trust between the patient and dental practitioner as well as the patient’s sense of control increases.¹³ Negative feeling such as loss of control is cited commonly by patients as being fear and anxiety-provoking. Fear can be a normal reaction for children, especially in unfamiliar situations where they lack control or perceive the potential for pain. When compared to non-anxious patients, more anxious patients feared feeling out of control.^{13,19,24} Informing new patients (before treatment) about the way they can interrupt the operator during treatment, may overcome this “loss of control” fear, and has

been shown to be effective in anxiety reduction.²⁵ Sartory et al. find that the avoidance behaviour in dental phobia could be reduced by extending patients' control over treatment conditions.²⁶ Baron et al. confirm the results obtained by Sartory and determine significant reduction in children's DF and refusal behaviour by giving them control in the stressful dental environment.²⁷ Moreover, individuals who report both pain and lack of control were 15.99 times less likely to be willing to return to the same care provider, and are 13.7 times more likely to be highly fearful of the dentist than those who do not report pain or lack of control.²⁷

Parental presence/absence in dental office

In recent years, there is a general trend among parents to be with their children in the operatory when they undergo dental treatment and to actively assist the dentist when behavioural problems are encountered. The reasons are that parents want to know what happened, they think they could actively support the dentist when their child has behavioural problems, and they feel the child benefited from their presence ending in reduction of children's DFA. There is a debate on the effect of parental presence in the treatment room on children's DA. Studies in this research area, conducted in children of different ages, report conflicting results.^{2,28,29} Most children respond positively when their parent is in the treatment room.³⁰ Occasionally, the presence of a parent has a negative effect on the necessary communication between the child and the dentist.³¹ The results obtained by the study by Marzo et al. also show a negative impact on child's DA and behaviour for parent's presence.²⁸ Few authors observe a positive impact on the parent's presence during the dental visit.^{32,33} Frankl et al. indicate a significant increase of the cooperative behaviour in 3.5-4.5-year-old children when the mother is present in the dental office. The authors' interpretation is associated with the young age of the participants who feel parental support in the new and unfamiliar environment.³³ Nowadays, there are no studies that demonstrate a positive impact for the parent's presence on child's anxiety and fear. Most researches in this area show that the parental presence or absence in the treatment room has no impact on the anxiety level of the children.³⁴⁻³⁷ Afshar et al. investigate this relationship among 67 5-year-old children. The patients' responses during the procedures are assessed using a combination of two measures, including heart rate (objective measure) and clinical behaviour (subjective measure). The results show no significant differences in the anxiety ratings between the two subgroups concerning parental presence or absence.³⁸ In a study, conducted on 175 4-12-year-old children, Cox et al. find no difference whether the child was treated with or without the parent(s) in the dental operatory. For this reason, the authors reject the idea of a positive influence of parental presence on DA in the dental office.³⁴ A review of a number of studies that research the relationship parental presence-dental anxiety also rejects this hypothesis.³⁵⁻³⁷

Factors of dental environment. Instruments, blood, unpleasant smell and taste, sound of the dental drill, sensations provoked during dental treatment

Pediatric patients identify a number of fear- and anxiety-provoking specific and non-specific stimuli in the dental setting. Taani et al. investigate factors of dental environment associated with DFA in children. Fear of specific stimuli (pain) is the most common source of DF. The sight and sensation of the anaesthetic needle and the sight, sound and sensation of the drill are rated the most fear-eliciting stimuli.³⁹ In 2012 Brady et al. develop a questionnaire to investigate DA and identify factors that enhance/lessen DA in the surgery setting. The results support findings by other studies and show that 60% of respondents claimed that they were afraid of pain. When compared to non-anxious patients, anxious patients feared the needle, the drill, and being bothered by the smell associated with dental materials.¹⁹ The analysis of lots of similar studies identifies the sight and sound of instruments and dental drill, needle and blood, fear of pain, unpleasant smells and sensations, provoked during dental treatment, as particularly fear- and anxiety-provoking factors in dental environment.^{19,39,40}

Dentist and dental team

The dentist's behaviour and the attitude of the dental team is another factor associated with children's DAF. Studies have shown that the first dental visit is an important variable in the subsequent development of children's attitudes or beliefs about dentists and dental treatment. A positive dentist-patient relationship can have a positive effect on the patient's DFA.¹⁶ An unpleasant first visit, however, may negatively influence further treatment and/or lead to DA.^{15,16} Negative childhood experience thus plays a key role in the development of DA in adults.¹⁴ Several studies indicate that unfriendly dental staff, negative dentist behaviour and shorter mean treatment time are risk factors for DA.^{7,40} Brady et al. find that the majority of respondents had a preference for a dentist that was a young, friendly and talkative dentist and dental team.¹⁹

Oral health status

Poor oral health plays a significant role in initiating DFA. The assessment of oral health includes an appraisal of DMFT/dmf index and oral hygiene status. The results of a study in 3,204 urban Swedish children show that child DF was strongly associated with poor oral health and prevalence of dental caries.² In a study of 1303 French children aged 5-11 years, Nicolas et al. find that children who had at least one decayed tooth presented a higher level of DF than those with no decay.⁴¹ The results of another research demonstrate that the mean dmft and DMFT values of children who were afraid of dentists were significantly higher than those of children who were not.⁴² The data obtained confirm the direct association "DFA-dental caries and missing teeth due to caries".^{2,41-43} The emergency dental service is used most frequently by children with a high prevalence of dental

caries which is associated with a greatly increased risk of ending up in a vicious cycle of fear and anxiety.¹⁷ Oral hygiene also has a significant impact on oral health status. A review of the scientific literature in pediatric dentistry shows that the association between DFA and oral hygiene in children has been comparatively less studied. In a pilot study among 4-12-year-old children in Bulgaria, Silness and Loe criteria are used to quantify plaque deposition, whereas DA is assessed using Venham picture test. The results demonstrate statistically significant association between DA and plaque index in children with dmft/DMFT \geq 1. The authors interpret the data obtained with the pain and discomfort experienced during tooth brushing which demotivate children to perform oral hygiene.⁴³ In 2012 DeDonno et al. conclude that higher DA was associated with poorer oral hygiene practices among American students.⁴⁴

Previous medical experience and hospitalization

While most of the researchers investigate the dental environmental factors that contribute to the development of DFA, some authors focus on the previous medical experience and hospital admission. Most studies demonstrate that the past medical experience has significant influence on DF.^{4,18} Children's experience directly affects dental behaviour in future dental visits, while painful and threatening experiences in the medical setup provoke fearful reactions in the dental setup.^{3,43} TenBerge et al. indicate hospitalization as a risk factor for the development of DF.¹⁸ A study by Colares and Richman shows that invasive medical care and history of hospital admission are potential causes of DFA.⁴⁵

CONCLUSIONS

Dental fear and anxiety are common problems in children worldwide; therefore, new strategies to overcome this relevant child condition should be encouraged. As the etiology is multifactorial, it is far more complex than to be explained by a single contributing factor. To treat children and adolescents, paediatric dentists need to assess the patient in relation to personal, social and environmental aspects, and assessments may be carried out using well-established methods to gain more knowledge about the individual patient. Further investigations in this area are recommended.

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Дентофобия и тревога у детей: обзор факторов окружающей среды

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Резюме

Дентофобия и тревога – это психологические реакции, которые существенно нарушают ход повседневной жизни. Это проблемы, с которыми сталкиваются многие пациенты во всём мире, и они по-прежнему представляют собой серьёзную проблему при оказании адекватной стоматологической помощи. Многофакторная этиология дентофобии и тревоги у детей определяет влияние множества различных факторов риска на их развитие.

Цель этого обзора – проанализировать научную литературу, посвящённую различным факторам, связанным с дентофобией и тревогой у детей. Наш обзор литературы представляет собой критический анализ сопутствующих факторов стоматологической среды, которые были изучены в литературе, и даёт представление о возможных объяснениях влияния этих факторов на пациентов детского возраста.

Понимание этих факторов поможет справиться с поведением тревожных детей. Результаты обзора литературы дают основание начать исследования по изучению влияния способствующих факторов во всех возрастных подгруппах детей.

Ключевые слова

тревога, дети, стоматология, факторы, страх
