

# JOURNAL OF DYNAMICS AND CONTROL VOLUME 8 ISSUE 10

# EXPLORING THE ROOTS OF DENTAL ANXIETY AMONG PEDIATRIC PATIENTS – A LITERATURE REVIEW

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# EXPLORING THE ROOTS OF DENTAL ANXIETY AMONG PEDIATRIC PATIENTS – A LITERATURE REVIEW

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ABSTRACT: Dental anxieties and phobias are significant issues among children in dental clinics. Addressing the underlying causes of dental phobia is essential before beginning their treatment. This literature review aims to analyse and summarize academic discussions on the etiology of children's dental fear, strategies to identify these fears, and management techniques for dental phobia in clinical settings. The literature search was conducted using electronic databases, including Medline/PubMed, Embase, and Web of Science, focusing on the association between dental fear and children in dental clinics. Only articles related to children's dental fears were included. Dental anxiety and phobia can impact a person's quality of life, making it crucial to identify the causes of fear and alleviate these obstacles to provide better oral health care and improve the overall well-being of anxious children in dental clinics.

KEYWORDS: Dental anxiety, prevalence, children fear, dental phobia, behaviour mechanism.

### 1. Introduction

The fear of dentists and dentistry can affect many individuals and have varying intensities and types. In literature, the terms "dental fear" and "dental anxiety" are the most commonly used ones. "Fear" usually refers to an emotion towards an object or situation in the present tense that is "here and now", while "anxiety" is more diffuse, anticipatory and oriented more towards- future events. These terms are often used synonymously in the literature, since they are phenomena that are hard to separate in a dental clinical situation, mainly because the physiological responses are the same including- muscle tension, sweating, increased heart action, stomach symptoms etc. Although "dental anxiety" is used more often, "dental fear" or "dental anxiety" is usually used as interchangeable general terms for being afraid of dentists and dentistry at all levels of intensity [1]. Often, people can be aware of their physical and behavioural changes without clearly identifying that they are anxious or fearful. Apart from the adults, dealing with the anxiety levels of children is even more complicated. The dentists' appearance, clinical environment, and equipment can cause anxiety in the child, which ultimately affects the quality of care provided during dental treatment. The behavioural manifestations in children include crying, screaming and resisting dental treatment. The fears and anxieties observed in children are a part of their normal development and are usually transient. One of the most common examples is separation anxiety which occurs at 12 to 18 months and does not persist for long [2]. Other challenges include children at younger ages having difficulty communicating about their cognitive skills, emotional responses, and language skills. The most common causes of fear in infancy and early childhood are strangers, loud noises, looming objects, sudden confrontation by unexpected objects and unfamiliar people. By the early school years, the fears had broadened to include the dark, staying alone, imaginary figures, objects, events and particular people. At about nine years old, fear of bodily injury also begins to feature strongly. The amount of dental anxiety decreases as adolescence progresses. This descent of dental anxiety is accredited to the rise in ego strength accompanied by the development of metacognition preparing the child to use different coping styles. In modern times, dentists were depicted as caricatures in mass media of Orin Scovilla DDS by actor Steve Martin in the film "Little Shop of Horrors' in 1986 terrorizing children in the waiting room. The reason for displaying dentists as figures of fear and humour, is that humour is seen as comic relief, and society laughs at and ridicules its fears, in the same way that individuals do, by exaggeration and mockery.

Dental anxiety among children has a complicated and multifactorial aetiology. Factors like age and gender play a fundamental role in its expression. However, these two factors are modulated by other variables such as culture and behaviour, which may influence dental anxiety in children [3]. Different studies show a variation in the prevalence of dental anxiety in children. [4-8]. Due to fear, children tend to avoid treatment procedures, which can worsen oral hygiene and lead to complications later on. Various behaviour-shaping techniques including tell-show-do (TSD), positive reinforcement, effective communication, modelling and distraction are used to tackle children who are anxious and seem too uncooperative. Some instruments are also accessible for the measurement of anxiety levels in children which are the 'modified child dental anxiety scale' (MCDAS), Child Fear Survey Schedule - Dental Subscale (CFSS-DS), Venham's picture test (VPT), facial image scale (FIS) and 'dental fear survey' (DFS) [9]. These instruments are the most commonly used and are more reliable and valid in multiple languages. However, to prevent poor oral health, it is necessary to identify dentally anxious individuals and to treat them appropriately when they arrive at the dental office. The practitioner should aim at alleviating the anxiety and fear in such a way that these patients are positively motivated on a long-term basis for future dental visits. The review aimed to evaluate the aetiology of dental anxiety in children and strategies to identify and manage anxiety with different management techniques in the dental office.

### 2. Methodology

A literature search was made in electronic databases such as PubMed, PsycINFO and Google Scholar, accessed via the National Library of Medicine, PubMed interface for relevant articles on dental anxiety in paediatric patients' children using keywords like dental anxiety, children, dental fear, behaviour mechanism. The articles published from 1973 to 2023 year that were related to the prevalence of dental anxiety in children concerning age and gender variation in the dental clinic. The literature received through cross-referencing and those by the manual search were also included in the review. All the articles were selected according to inclusion criteria: -

- Studies focusing on the prevalence of dental anxiety in children and its correlation with age and gender.
- Literature focusing on the aetiology of a child's dental fear and behaviour mechanism.
- Studies on prevention of dental anxiety in children and management techniques in dental clinics.

# 3. Literature review

The articles included are thematically presented in this review.

### **3.1 Prevalence of Dental Anxiety**

The prevalence of dental anxiety is approximately 9% of children in the United States, Canada, and Europe [4]. However, a 26% prevalence was observed in Italian kids from six to ten years old [5]. The considerable variation in reported prevalence could be caused partly due to differences in methodologies. Few studies in India reported the prevalence of dental anxiety in children in a particular group of populations. In a cross-sectional study by Sathyaprasad *et al.* (2018) found a prevalence of dental anxiety of 24.5% among children five to ten years old in Karnataka in Fig 2.[6]. A cross-sectional study by Chhabra *et al.* (2012) found that the prevalence of dental anxiety was as low as 6.3% in North Indian children of 5–10 years [7]. On the contrary, Kumar *et al.* (2019) found that the prevalence of dental anxiety was high (84.4%) among 6- to 12- year-old South Indian children, [8]. Thus, studies conducted worldwide showed evidence of heterogenicity in the prevalence of dental anxiety in children. Dental anxiety has been found to correlate with gender and is more common in girls than boys as reported by Gaber *et al.* (2018) in Fig 1.[10].



Fig 2. Distribution of children according to the frequency of dental anxiety. The X-axis represents the Children's Fear Survey Schedule - Dental Subscale (CFSS-DS) anxiety score while Y-axis represent the age group of children.[6]

### 3.2 Psychological Factors Contributing to Dental Anxiety

### General psychological theories of anxiety relevant to children

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This theory provides better understanding of child's behaviour, thought, and development. It also helps us to know the problem of psychological origin. It also helps us to deliver dental services in a meaningful manner and establish effective communication with the child and parent. An understanding of child development is essential because it allows us to completely appreciate the cognitive, emotional, physical, social, and educational growth that children undergo through from birth and into early adulthood.

### Erikson's Psychosocial Developmental Theory

Erikson's eight-stage theory of psychosocial development describes growth and change throughout life, focusing on social interaction and conflicts that arise during different stages of development. His eight-stage theory of human development described this process from infancy to adulthood. During each stage, people are faced with a developmental conflict that impacts later functioning and further growth. The stages of development are shown in Fig 3.



Fig 3. Erikson's Stages of Development [Kendra cherry; Erikson's Stages of Development; May 2024;Very well mind]

### **Piaget's Cognitive Developmental Theory**

Cognitive theory is concerned with the development of a person's thought processes. This theory seeks to describe and explain the development of thought processes and mental states. It also looks at how these thought processes influence the way we understand and interact with the world. The theory of cognitive development by Jean Piaget (1936) includes four stages are as follows:

- <u>Sensorimotor Stage (Birth to 2 years)</u>: In this stage, an infant's knowledge of the world is limited to his or her sensory perceptions and motor activities. Behaviours are limited to simple motor responses caused by sensory stimuli.
- <u>**Pre-Operational Stage (2 to 7 years):**</u> The stage when a child learns to use language. During this stage, children do not yet understand concrete logic, cannot mentally manipulate information, and are unable to take the point of view of other people.
- <u>Concrete Operational Stage (7-11 years)</u>: The stage when children gain a better understanding of mental operations. Children begin thinking logically about concrete events but have difficulty understanding abstract or hypothetical concepts.
- **Formal Operational Stage (12 years and above):** In this stage, when people develop the ability to think about abstract concepts. Skills such as logical thought, deductive reasoning, and systematic planning also emerge during this stage.

# **3.3** Specific psychological triggers for dental anxiety (e.g., fear of pain, negative past experiences)

Dental anxiety can arise due to multiple factors, such as previous traumatic experiences, especially in childhood (conditioning experiences), misinformation from anxious family members or peers, individual personality characteristics such as neuroticism and self-consciousness, lack of understanding, exposure to frightening portrayals of dentists in the media, perception of body image, and the vulnerable position of lying back in a dental chair [11,12]. Anxiety can also be provoked by sensory triggers such as sights of needles and air-turbine drills, sounds of drilling and screaming, the smell of eugenol and cut dentine, and also sensations of high-frequency vibrations in the dental setting [13-15]. Some common fears giving rise to dental anxiety are fear of pain, blood-injury fears, lack of trust or fear of betrayal, fear of being ridiculed, fear of the unknown, fear of detached treatment by a dentist or a sense of depersonalization, fear of mercury poisoning, fear of radiation exposure, fear of

choking and/or gagging, a sense of helplessness on the dental chair, and lack of control during dental treatment [16]. The cycle of dental anxiety is depicted in Fig 4.



Wide U, Hakeberg M. Treatment of Dental Anxiety and Phobia-Diagnostic Criteria and Conceptual Model of Behavioural Treatment. Dent J (Basel). 2021 Dec 17;9(12):153. doi: 10.3390/dj9120153. PMID: 34940050

# 3.4 The role of temperament and personality traits

Temperamental and personality trait vulnerabilities such as Eysenck's neuroticism, Gray's trait-anxiety, or Kagan's behavioural inhibition, which are likely to be overlapping constructs, are consistently viewed to play an important role in anxiety disorders. The temperamental concept of behavioural inhibition reflects the consistent tendency to display fear and withdrawal in unfamiliar situations. Behavioural inhibition is at least moderately stable, detectable early in life, and under some genetic control. Children with behavioural inhibition are shy with strangers and fearful in unfamiliar situations and it was shown to be a risk factor for the development of anxiety disorders [17,18].

# **3.5 Environmental and Social Influences**

Environmental and social influence play an important role in children dental anxiety. A traumatic experience (such as a divorce, illness, or death in the family, or major events outside of the family) may also trigger the onset of an anxiety disorder. In addition, anxiety may be learned from family members and others who are noticeably stressed or anxious around a child.

# 3.6 Impact of parental anxiety and attitudes towards dental care

Overprotection increases the risk for anxiety disorders. High levels of coldness and authoritarianism in parents were modestly associated with increased risk for nearly all disorders. Lieb *et. al* (2000)[19] and Knappe *et. al* (2009)[20] showed that parental overprotection and parental rejection were significantly associated with increased rates of social phobia in offspring. Children of overprotective parents may feel the concerns and fears of their parents when visiting the dentist. Moreover, the protective behaviour of parents may have conditioned the child to express discomfort or protest to get out of uncomfortable situations, such as treatment at the dentist [21]. Meanwhile, in cases of authoritarian parenting style the children always fear and concern from their parents leading to extending their fear to society, relatives and friends and the social environment.

# 3.7 Influence of dental clinic environment and dentist-patient interactions

Many paediatric dentists take great care in designing their offices to be inviting and fun for children. This can include colourful decor, a play area, and child-oriented entertainment options. A child is less likely to feel anxious in a familiar and engaging environment. A paediatric dentist's clinic is specifically designed to cater to the needs of children, and the assistants are trained in ways to help children stay relaxed and comfortable during treatments. These clinics are often stocked with the latest toys and games to help children associate dental trips with positive memories. Even the tools a paediatric dentist uses to treat children are specifically designed for their smaller mouths. Child friendly dental clinic is shown in Fig 5 and 6.



Fig 5. Dentist Visit Stock Illustrations; Dreamstime.com



### 3.8 Cultural factors and societal perceptions of dental care

Culture plays a significant role in the cognitive development and expression of anxiety in the child, so it also affects both behaviour and symptoms related to anxiety. It may contribute to variability in interpretation and style of response to stimuli which provoke anxiety. This may be a result of the differing levels of dissimulation in different cultures [22]. Christian children reported more fears than Muslims children due to Islamic culture[3] whereas in African cultures, the children have more self-control and emotional restraint, differing from Euro-American countries, which may encourage greater externalization of feelings[37].

### 3.9 Psychological Impact of Dental Anxiety

Children with specific fears and phobias (especially fear of darkness), social phobia, or other types of anxiety disorders (agoraphobia, panic disorder, have an increased risk of developing a subsequent

depressive disorder. Substance abuse, or dependence (alcohol or drugs and medication) is a frequently occurring heterotypic problem among subjects with anxiety disorders. This substance use is motivated as a possibility to deal with anxiety symptoms, leading to substance-related problems and disorders over the long term.

# 3.10 Interventions and Management Strategies

Cognitive behavioural therapy aims to alter and restructure the content of negative cognitions and enhance control over negative thoughts. The patient's focus is directed away from his or her worries about the feared situation by using different cognitive techniques, such as encouragement, altering expectations, distraction, guided imagery, focusing attention, and thought-stopping [23]. Cognitive behaviour therapy (CBT) is a combination of behaviour therapy and cognitive therapy. It is today the most accepted psychological treatment for anxiety related to particular situations and specific phobias. It involves learning to change negatively distorted thoughts (cognitions) and actions (behaviours). This method is useful in the management of anxious children in dental clinics.

Another simple technique is the relaxation technique. It is deep breathing and progressive muscular relaxation which lowers stress and anxiety levels and helps a person cope with the symptoms of anxiety. The deep relaxation technique is capable of improving mood and reducing the levels of stress in the chest and providing more oxygen for the body per breath. This relaxation breathing is effective in reducing perceived pain. One of the best techniques for diverting the patient's attention from a perceived unpleasant procedure is distraction. In the distraction technique patient listens or engages in background music, television sets, computer games, and 3D video glasses for watching movies. This method with pleasant and calming music during a long stressful procedure can influence human brain waves, leading to deep relaxation and reduction of pain and anxiety in both children and adults [24].

Parents can play a vital role in helping children manage anxiety by providing emotional support, building coping skills, and helping their children confront their worries. Parental encouragement of brave behaviours also contributes to the strengthening of neural networks underlying behavioural activation and approach motivation. Enhancing the consciousness of family oral health care is of utmost significance for the prevention of children's dental fears. Oral health greatly affects people's quality of life, and for children, their oral health condition can be closely related to parents' oral health awareness in their upbringing. Mishra *et al.* (2018) [25] reported that children in families with low parental awareness of oral health were more likely to experience toothache. Dental caries harm oral discomfort, which may aggravate the children's fear of clinical treatment, playing a role in the formation of dental anxiety in children. Therefore, it is of great necessity to raise the awareness of oral health care among family members but not limited to parents. Besides, by educating children for early prevention, such as correcting teeth brushing methods, using fluoride toothpaste, controlling sugar intake, etc. family members can help children maintain a good oral health condition, thereby decreasing dental anxiety.

# 4. Discussion

Dental anxiety in children has been a major concern for dentists for a long time. Information on the origin of dental anxiety and uncooperative behaviour in a child patient before treatment may help the paediatric dentist to plan appropriate behaviour management and treatment strategies. Children usually have limited communication skills and are less able to express their fears and anxieties. Their behaviour is a reflection of their inability to cope with dental anxiety which eventually leads to avoidance of dental

care and poor oral hygiene. An understanding of the possible predisposing factors to dental anxiety in children is of utmost importance.

The significance of dental anxiety as an issue in dentistry is magnified by the high prevalence

of dental anxiety reported in many countries, which varies from 3% to 43% in different population [26-28]. Whereas the prevalence of dental anxiety in children varies from 6.3% to 54% in the Indian population [6,7,9]. The difference in prevalence estimates may partly be due to differences in methodologies and different sample populations used in their studies.

The aetiology of dental anxiety is multifactorial. The association of dental anxiety with age, gender, culture and has been studied for a long, but the results obtained by various investigators have been varying on geographic and cultural backgrounds and have been inconclusive.

Some studies found that dental anxiety was more pronounced in younger children (4-6 years) compared to older children (9-11 years) [29,30]. It was also reported that dental anxiety begins to decrease by 6-7 years, with most children being able to cope with dental situations by that age and so impulse control is developed. Childhood fears are often related to developmental changes in children and the nature of fears prominent in a child's life also seems to depend on a child's age. For a preschooler, attachment and separation anxiety often play an important role, whereas at a later age (from 8 years on) fear of bodily injury and social fears become more prominent. Most of these developmental stages, show appropriate fears decreasing or disappearing as children grow older, due to increased ego strength and the development of cognitive abilities, providing a child with adequate coping style [3].

Parents are known to transmit feelings of fear and anxiety to their children. According to previous authors, mothers with high anxiety levels have most often been shown to exert a negative influence on their children's behaviour in the dental office and it has been suggested that one can understand, predict and influence a child's dental behaviour through mother's attitude towards dental care [31,32]. One underlying reason for this effect on the child may be the traditional division of family tasks, which usually results in the mother rearing the child and accompanying the child to the dentist. Therefore, maternal influence is found to have a more pronounced effect on a child's dental anxiety.

Gender plays an important role in a child's dental anxiety. There is a significant correlation between child dental anxiety and gender, as reported by Alshoraim *et al.* and Gaber *et al.* (2018)[10]. Girls were more dentally fearful than boys because they tended to show their feelings, unlike boys who tend to hide their fear [10,33,34]. In contrast, some researchers have found no effect of gender on dental fear [35,36].

Dental anxiety in children is also influenced by culture. Ingman *et al.* (1999) on the importance of the effect of culture on dental anxiety in children showed that within same region Christian children reported more fears than Muslims. Furthermore, African children tend to endure stress and American or European children easily express their anxiety and feelings in the dental clinic [37,38]. On the contrary, Satyaprasad *et al.* (2018)[6] did not find a statistically significant association between culture and child dental anxiety.

In order to prevent dental anxiety, it is necessary to identify several contributing factors before dental treatment. Various behavioural therapies are used to manage the child's dental fear in the dental clinic. The use of behavioural therapies can help children deal with dental anxiety and prevent mental and oral health.

### 5. Conclusion

Dental anxiety is a widespread problem both for dentists and for patients, which can have a significant impact on paediatric oral health. Identification and elimination of dental fear is very important and should be treated before any dental treatment. This literature reviewed contributing factors (age, gender, parental role, personality traits and environmental factors) and their influence and effect the level of

dental anxiety in children. If the factors are familiarized prior to dental treatment, it will facilitate behaviour management in anxious children. Children can cope with anxiety in the dental clinic by using this behaviour management, which will further improve their oral health.

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