

A Systematic Review of The Relationship Between Parental Stress and Early Childhood Caries

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Abstract

Background: Until now, there has been a lack of comprehensive evaluation to establish the extent to which parental stress affects children's oral health, such as the occurrence of dental caries. This study aimed to explore the relationship between parental stress and early childhood caries (ECC).

Objective: The objective of this review was to evaluate the association between ECC development and stress-related factors, including parental stress.

Method: A comprehensive web-based search identified 12 studies that examined parental stress and Early Childhood Caries.

Results: The research examined several areas related to parenting, including satisfaction with parenting, parenting-related stress, the parent-child relationship, and specific parenting practices. Out of 12 studies, 10 studies showed that there is a correlation between parental stress and the occurrence of early childhood caries, and 2 studies showed there is no association.

Conclusions: The systematic review focuses on the work of researchers who have studied parental stress and how it is related to the occurrence of early childhood caries. A consistent association between parental attitude and oral health outcomes in children has been demonstrated by these studies. Despite several studies on the relationship between parental stress and early childhood caries (ECC), the overall literature is limited by methodological constraints that hinder the ability to establish a causal link between parental stress and ECC.

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Further study is also needed to advance our current understanding of the association of Early Childhood Caries and Parental Stress

Keywords: Parental Stress; Early Childhood Caries; ECC; Oral Health; Dentistry

Introduction

Early childhood caries, also known as ECC, is characterized by the presence of one or more tooth surfaces in a primary tooth that is decayed, missing due to caries, or filled, in children who are 71 months of age or younger. This condition is caused by the biofilm (plaque)-induced acid demineralization of enamel or dentin, which is mediated by saliva. In simpler terms, ECC is a disease that results from the breakdown of teeth due to acid produced by bacteria in dental plaque, and it affects children who are less than six years old [1].

Among childhood conditions, early childhood caries is widely regarded as one of the most prevalent and chronic [2]. Eliminating early childhood caries (ECC) is difficult due to the intricate interaction among various risk factors, including cultural, social, behavioral, nutritional, and biological aspects, that contribute to the onset and advancement of the disease [3]. The period of childhood and early adolescence is vital for the establishment of healthy teeth, but unfortunately, early childhood caries (ECC) have become the prevalent chronic infectious disease in children, presenting a significant public health challenge that is challenging to manage. While not posing a threat to life, early childhood caries (ECC) have a substantial impact on both individuals and communities, causing discomfort, limiting functionality, and hindering a child's growth rate, body weight, and overall ability to thrive. As a result, it significantly reduces the quality of life of the affected individuals [4].

The prevalence of early childhood caries (ECC) among 3-5-year-old children varies across continents and countries. According to available data, the United States has a higher incidence of ECC than European countries, with approximately 40% of children developing caries by the time they reach kindergarten age. On the other hand, in the United Kingdom, only 12% of 3-year-old children were found to have visible caries [5]. Based on the 2011 National Oral Health Survey in Japan, a quarter of 3-year-olds had experienced caries, with a decayed and filled primary teeth rate of 0.6. However, published studies have revealed a greater prevalence of ECC in other regions of the world. For instance, ECC rates have been reported to be higher in Asia (ranging from 36% to 85%), Africa (38% to 45%), and the Middle East (22% to 61%) [6]. High prevalence and severity of ECC have been reported in Cambodia and Indonesia, with over 90% of 3-5-year-old children affected, and a decayed, missing, and filled teeth rate exceeding 6. In Iran, Senegal, and Thailand, ECC rates range from 50-60% among the 3-5-year-old age group. Nonetheless, in some countries, ECC severity has shown a decline, as evidenced in Thailand. Notably, data indicate that the incidence of ECC increases with age and can even begin as early as 12 months old, as reported in Nigeria [6].

Historically, inappropriate and prolonged use of bottles or breastfeeding was attributed to early childhood caries (ECC). Although the use of a bottle at bedtime is recognized as a contributing risk factor for early childhood caries (ECC), it is not the only factor involved in its development during infancy. Furthermore, it has been

noted that the specific risk factors associated with ECC may vary among different populations [7]. Additionally, the relationship between early childhood caries (ECC) and inappropriate feeding practices is not uniform and can vary based on the study. As such, it is no longer considered the primary cause of ECC [8,9]. Fruit juices and carbonated beverages have also been found to be involved in children diagnosed with ECC. Several studies have shown a correlation between a child's brushing habits and the incidence and progression of dental caries. Specifically, the frequency of brushing has been identified as a contributing factor to the development of caries in children [10,11]. Studies have demonstrated a connection between the educational attainment of parents and the likelihood and seriousness of early childhood caries (ECC) in their offspring [12]. Higher levels of parental education have been linked to a lower prevalence of dental caries [12]. Early childhood caries (ECC) is prevalent among individuals with parents of limited educational backgrounds, particularly those with mothers who are illiterate, and children from single-parent households. In the context of ECC distal, intermediate, and proximal level factors refer to different levels of influence on the development and progression of dental caries in young children.

Distal level factors may include socio-economic status, parental education level, and community-level factors such as access to fluoridated water. These factors can have an indirect influence on the child's risk for ECC.

Intermediate-level factors may include parental beliefs and attitudes towards oral health, as well as the child's dietary habits and oral hygiene practices. These factors

can directly influence the child's risk for ECC.

Proximal level factors refer to factors that are in close proximity to the child, such as the presence of cariogenic bacteria in the mouth or exposure to sugary drinks or snacks. These factors have an immediate and direct effect on the development and progression of dental caries. Understanding the various distal, intermediate, and proximal level factors associated with ECC is important for developing effective prevention and intervention strategies. By addressing these factors at different levels, it may be possible to reduce the burden of ECC in young children [13].

The underlying reasons for disparities in early childhood caries (ECC) are frequently attributed to upstream factors such as education, income, social class, occupation, and access to dental care. Despite this, many preventive measures concentrate on downstream factors, which are considered easier to manage. In other words, while upstream factors are highly associated with ECC, downstream factors are targeted more frequently due to their relative accessibility in terms of intervention.

This is because while upstream factors may have a significant impact on ECC, they are often much more difficult to change through public health interventions. For instance, improving access to care and increasing educational opportunities for low-income families may require significant policy changes that take time to implement, whereas targeting factors such as dental hygiene and sugar consumption can often be addressed more easily and quickly through targeted interventions [13,14].

Early childhood caries (ECC) is associated with a variety of factors, including oral

health knowledge, behavior, parental attitudes, and psychosocial factors, as outlined by various frameworks. One such framework, presented by Patrick et al., examines the interplay of political, social, cultural, and economic factors that influence ECC, illustrating different pathways through which these factors can affect the development of the ECC [13]. Another framework, focusing on downstream factors, highlights the impact of maternal education level, beliefs, locus of control, and stress on maternal psychological distress, which can, in turn, lead to poor oral health behaviors and increase the risk of ECC in their children [13,15].

Limited research has explored the connection between parental stress and ECC. Parenting stress, family environment stress, and other types of stress are interconnected and often overlap. When parents experience stress, it can affect their children's behavior and lead to negative outcomes. To better understand the impact of family stress on parenting, it is helpful to differentiate between two types of stress: parent stress and child stress. Parenting stress can be categorized into different types, one of which is related to the child's characteristics that can create challenges for the parent in meeting the child's needs [16]. On the other hand, factors such as parental stress and family characteristics cover a broad spectrum of stressors, including emotional, financial, acute, and chronic stress, as well as potential dysfunctions that affect different aspects of parenting function [17].

Objective

This current review aimed to evaluate parental stress and background factors

related to stress that are associated with the occurrence of ECC.

Methods

Study Design

In this review, we examined studies conducted published between 2000 and 2019. Studies published in PubMed in English with full text available were included in this review.

Search criteria

The inclusion criteria for the search were as follows:

- 1) Studies that have utilized Early Childhood Caries (ECC) as a metric to assess oral health outcomes. Most studies assessed dental caries by measuring decayed (d), missing (m), filled (f), surfaces (s), or teeth (t); caries extending enamel (d₁-d₂) and dentin (d₃) surfaces; decayed (d), filled (f), teeth (t) index, decayed teeth (dt), missing teeth (mt), filled teeth (ft) rates, or presence/absence of caries (i.e., dmft > 0).
- 2) Studies that measured Parental stress
- 3) Studies that encompassed children within the age range of 0 to 72 months (up to 6 years)

When selecting studies to include in the analysis, there were no restrictions placed on study design, and both longitudinal and cross-sectional studies were considered. The results of the selected studies were then synthesized using narrative synthesis..

The selection criteria were used to identify a total of 628 studies initially. The first step in the selection process involved screening the titles to remove any duplicates, resulting in the removal of 3 studies. Subsequently, the 80 studies that met the selection criteria

were further evaluated by analyzing their titles and abstracts to determine their relevance and appropriateness for inclusion in the review. The inclusion criteria for the studies involved children up to the age of 6 years, measuring dental caries, assessing parental risk factors, and measuring the association between ECC and parental stress. Conversely, studies were excluded if they only discussed child factors and behaviors, were systematic reviews or editorials, involved children over 6 years old, did not measure dental caries, did not assess parental risk factors, or did not measure the association between ECC and parental stress. After applying the selection criteria and examining the titles and abstracts of the remaining studies, a total of 545 studies were excluded due to various reasons such as involving children over 6 years old, being systematic reviews or editorials, only discussing child factors and behaviors, not measuring dental caries, not assessing parental risk factors, or not measuring the association between early childhood caries (ECC) and parental stress. Of the remaining 29 studies, 12 met the inclusion criteria and were included in the review, while the other 17 were excluded. Figure 1 in the article depicts the step-by-step selection process of the studies, which ultimately led to the inclusion of a final set of studies presented in Table 1. The studies included in the review underwent thorough scrutiny and met the specific selection criteria, ensuring their relevance and reliability for the review.

The search terms used in PubMed to determine pertinent papers for the review were: (Dental Caries OR Dental Caries OR Dental Decay OR Carious Dentin OR dental caries OR dental AND caries OR dental caries OR carious) AND (Child OR Child, Preschool OR child OR children OR Preschool Child OR Preschool Children) AND (Parents OR Parent OR Parenthood Status OR Parental Age OR Parental Ages) AND (parental stress OR parent stress OR stress of parents OR stress as risk factor OR stress).

Results

Among the 12 studies that fulfilled the selection criteria, the majority were cross-sectional, while two were cohort studies and one was a case-control study, with only one randomized controlled trial. The Table 1 presented in the review summarizes the parental risk factors that were investigated across these studies. Parental stress was measured using a variety of tools, including the Parental Stress Index (PSI), comprehensive questionnaires, the Early Childhood Oral Health Impact Scale (ECOHIS), the Basic Research Factors Questionnaire (BRFQ), the Parenting Style and Dimensions Questionnaire (PSDQ), the Depression Anxiety Stress Scale questionnaire, and the Locus of Control scale, alongside comprehensive questionnaires and the modified PSI with the Centre for Epidemiological Studies Depression Scale (CES-D) in one study.

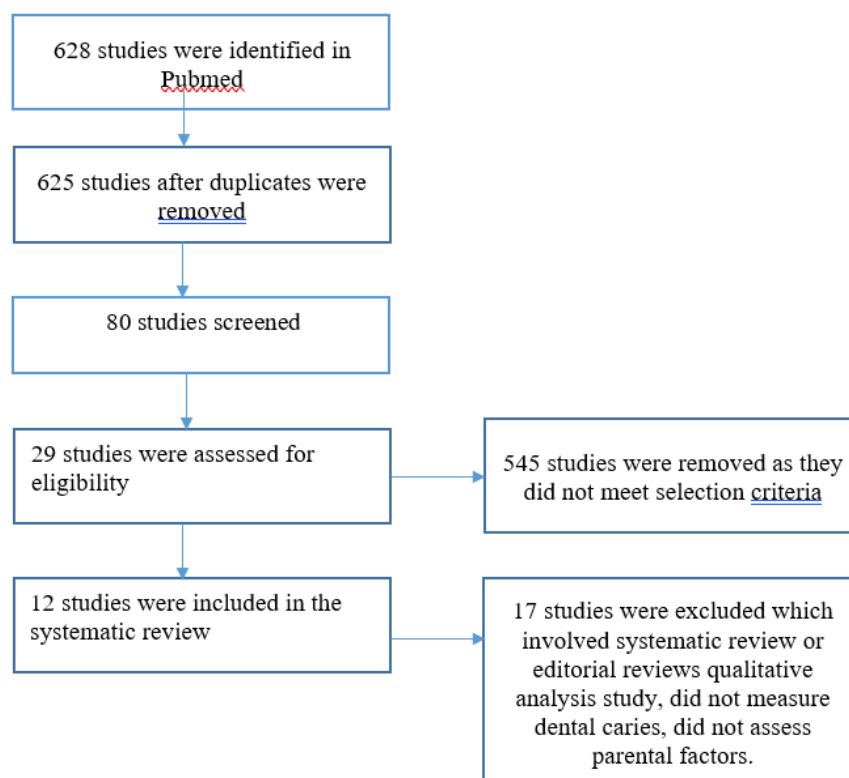


Figure 1: A flow diagram illustrating the selection process for the systematic review is presented above.

The assessment of caries was made by oral examination (visual and/or tactile). None of the studies used radiographs in the diagnosis of ECC.

The studies included in the review used various measures to assess dental caries. Table 1 provides an overview of the different measures used in each study.

These primary studies were conducted between 2000 and 2019 in the following countries: Asia, Europe, the Middle East, and America. In all studies, the number of study participants ranged between 97 and 1500 children with ages ranging between 0 months and 6 years old.

The 12 studies that met the inclusion criteria were analyzed, and the results indicated that 10 studies reported a positive correlation between parental stress and early childhood caries, while 2 studies did

not find such a link. The parental risk factors examined in these studies were classified into two categories: (1) general factors like parental education level and socioeconomic status (SES), and (2) parental role factors like oral health knowledge and behaviors, psychosocial factors, and environmental factors.

Parental Education Level And SES

Several studies included in this review examined the association between maternal education level and ECC, using different methods of assessment [18,19]. For example, one study categorized maternal education level based on schooling, while another cross-sectional study conducted in Iran by Jabbarifar et al included 256 children aged 4 to 6 years and their parents [17]. The results of the latter study showed that the mean dmft in the ECC group was 2.6 (SD = 3.15) and there were no caries in the caries-free

group. No significant differences were observed between the two groups in terms of parental occupation and education levels. In Kemthong's study, which involved 241 children, there were significant associations ($p < 0.05$) between parental education levels, monthly income, attitudes and behavior regarding their child's oral health, as well as careers influencing their abilities to care for their child's oral health, as rated by the parents [20].

Tang et al reported that 36% of the study participants ($n=35$) had at least one carious lesion. The researchers found a significant correlation between higher carious activity and lower income levels ($P < 0.01$), as well as defensive responding ($P < 0.01$) and total parenting stress ($P < 0.05$). However, in both dichotomous and linear models, no association was observed between early childhood caries and total parenting stress [21]. In a study conducted in China, the Early Childhood Oral Health Impact Scale (ECOHIS) scores were not found to be

significantly associated with children's demographic status or their parents' socioeconomic status. Only the dmfs index of the children was significantly associated with the ECOHIS scores, where an increase of 1 in the dmfs index was associated with a 10% increase in ECOHIS score ($IRR = 1.10$, $P < 0.001$), as reported in the final model of the study [22].

Multiple studies reported a higher prevalence of ECC in children whose mothers had low levels of education and came from low socio-economic backgrounds. For instance, one study conducted in Thailand revealed that sociocultural risk factors such as having no schooling for the child's mother, being male, having a lower household income, and being a Buddhist were associated with S-ECC [18]. Similarly, in another study, children whose mothers had no schooling and those who belonged to low socioeconomic groups were found to have higher caries prevalence [23].

Study	Age	Sample Size & Study Design	Parental Risk Assessed	Index Measured	Result/ Outcome
Tang C, Quinonez RB, Hallett K, Lee JY, Whitt JK. (Australia) (21)	4-5 years old	97 ; Cross sectional	Parenting stress and Caries assessment	PSI-SF and dmft	Association found in bivariate model and not significant association found in two part modelling analysis
Albino J, Tiwari T (U.S.A) (14)	3-5 years old	981; RCT	Parent characteristics associated with absence of caries	BRF questionnaire and dmft	Parents of caries-free children had higher Internal Oral Health Locus of Control scores, indicating they were more likely to believe they had some control over their children's oral health.
Sayed Ebrahim Jabbarifar,	2-6 years old	250; Cross sectional	Parenting stress and Caries assessment	PSI and DMFT	There was not any significant relationship between

Neda Ahmady (Iran) (17)					total parental stress and ECC.
M.Y.Li,Q.H.Zhi, Y.Zhou,R.M.Qiu,H.C.Lin (China) (22)	3-4 years old	1062; Cross sectional	Child oral health- related quality of life (COHRQoL) and ECC	Early Childhood Oral Health Impact Scale (ECOHIS) and dmft	The severity of early childhood caries has a negative impact on the oral health-related quality of life of preschool children and their parent
Kemthong Mitrakul, Vorawee Laovoravit (Thailand) (20)	Infant -6years old	241; Cross sectional	Parental attitudes and behaviour affecting their ability to care for their children's oral health	General questionnaire	Parental attitudes and behaviour regarding a child's oral health is associated with parental education level and monthly income.
Karl Peltzer and Aroonsri Mongkolchatii (Thailand) (18)	28 weeks (gestational)- 36 months after birth	597; Birth- Cohurt study	The prevalence and social risk factors of severe early childhood caries	comprehensive questionnaire and dmft	A very high rate of S- ECC was observed, and oral health may be influenced by social factors
Maram A. Alagla , Aljohara AL Hussyeen , Latifa Alhowaish (Saudi Arabia) (24)	3-6 yrs	280; Cross sectional	Parenting styles of parents with the oral health of their children	Parenting Style and Dimensions Questionnaire (PSDQ) and (DI-S)	Parenting style did not affect the oral hygiene and the dental caries experience of children directly
Prashanth Prakash, Priya Subramaniam (India) (23)	8months- 48months	1500; Cross sectional	To investigate the prevalence and related risk factors of ECC	Comprehensive questionnaire and dmft	Caries prevalence was 27.5% with a mean dmft of 0.854 and the risk factors for ECC included age, low maternal education, low socio-economic status, improper feeding and oral hygiene habits
Erika Lenčová, Hynek Pikhart (Czech Republic) (25)	3-5 yrs old	285; Cross sectional	Association between parental locus of control and children's caries experience and level of untreated caries was analysed	Questionnaire + LoC questionnaire and dmft	Statistically highly significant linear trend between increased parental LoC and higher probability of the children to be free from untreated caries,
Iipseeta Menon, Ramesh Nagarajappa (India) (26)	4-5 yrs old	800; Case- control	Association of parental stress as a risk indicator to early childhood caries (ECC) prevalence among preschool children	PSI-SF and dmft	Parental stress has a pervasive impact on the children's oral health

Lidia Gavic, Antonija Tadin (Crotia) (27)	under 71 months of age	235; Cross sectional	how the psychological status of parents affects oral health in children.	Depression Anxiety Stress Scale questionnaire	the incidence of active caries in the children was statistically significantly related not only to the level of parent depression but also the level of anxiety and stress
Tracy L. Finlayson, Kristine Siefert, Amid I. Ismail and Woosung Sohn (U.S.A) (28)	under 5 yrs of age	719; Cohurt	knowledge of the social determinants of oral health, by examining how several specific maternal health beliefs, behaviors, and psychosocial factors relate to young children's early childhood caries (ECC)	International Caries Detection and Assessment System (ICDAS) , Center for Epidemiological Studies Depression Scale (CES-D) and PSI(Modified)	Parenting stress was a significant predictor of ECC, and surprisingly, was inversely associated with children's ECC status, such that for each unit increase on the stress scale, the odds of the child having ECC reduced by about one-third

Table 1: Summary of studies included in Review

Parental Oral Health Knowledge and Oral Health Behaviours

A research conducted in the American Indian population found significant differences ($p \leq .05$) in several variables of the Basic Research Factors Questionnaire (BRFQ) between parents of caries-free children and those with caries. The BRFQ variables reflected oral health-related behaviors, knowledge, and attitudes. Parents of caries-free children had higher scores on Internal Oral Health Locus of Control, which indicated that they believed they had some control over their children's oral health. These parents also reported lower levels of personal distress and stress related to disruptive issues in the community [29]. From highest to lowest, the primary sources of daily stress were found to be time constraints, inadequate knowledge about brushing, work-related stress, not being the primary caregiver of the child, financial difficulties, and being a single parent [20].

Children who were habituated to breastfeeding and bottle feeding at night showed a noteworthy increase in the prevalence of caries. Similarly, caries increased significantly when children consumed snacks between meals. However, the study revealed that certain factors could decrease caries prevalence, including increased frequency of tooth-brushing, parental supervision, use of a baby toothbrush, and fluoridated dentifrice [23]. The study conducted by Mongkolchaty investigated several risk behaviors such as the lack of breastfeeding, allowing the child to suckle to sleep, introducing soft drinks at 12 months, sleeping with the bottle at 30 months, frequent consumption of sweet food, delayed tooth brushing initiation at 12 months, and less than daily tooth brushing before 30 months. The results showed that these risk behaviors were significantly associated with S-ECC [18].

Parental Psychosocial Factors

One study found that a mother's Sense of Coherence (SOC) was associated with ECC,

where mothers with lower SOC were 1.59 times more likely to have children with decayed teeth. In a case-control study by Menon et al (26), significantly higher mean parental distress scores were observed in cases (38.7 ; $SD = 12.34$) compared to controls (36.63 ± 12.37 , $p = 0.02$), as well as higher total parenting stress index scores in cases (199.75 ± 59.56) compared to controls (189.64 ± 59.39 , $p = 0.02$). There were significant correlations observed between ECC and parenting distress ($r = 0.78$, $p = 0.03$), as well as between ECC and total parenting stress index ($r = 0.80$, $p = 0.05$) in the study.

In a study conducted in Saudi Arabia, it was observed that most parents followed authoritative (94%, $n = 265$) and permissive (6%, $n = 17$) parenting styles. A significant number of children brushed their teeth by themselves ($n = 130$, 46.1%) and only once per day ($n = 163$, 57.8%). The study found significant correlations between the parenting style and children's brushing frequency (P-value of 0.016) as well as the number of meals consumed by children (P-value of 0.031). Additionally, the child's age and oral hygiene score were significantly associated with dental caries (P-value < 0.05)[24]. Erika's cross-sectional study found that there was a crude association between parental LoC and untreated caries in children. Specifically, the odds ratios showed a linear trend indicating that as parental LoC strengthened, the chance of the child being free from untreated caries increased. The study also found that when dmft was the dependent variable, there was a correlation between increasing parental LoC and a higher chance of their children having intact teeth [25].

In a cross-sectional study conducted by Lidia Gavic, it was found that the incidence of

active caries in children was significantly related to the level of depression, anxiety, and stress in parents. Multiple regression analysis showed a negative correlation between the dmft index in examined children and the level of parent depression. The results indicate that parents' mental health may be an important factor to consider in addressing childhood caries [27]. A study conducted by Tracy L on the correlation between depression and anxiety in mothers and ECC suggested that younger children who had received restorative care were more likely to have ECC. Additionally, the study found that higher education and income were protective factors, while lower parenting stress scores and a stronger belief in the importance of oral health were associated with a higher incidence of ECC. Furthermore, the age of the child was found to be a positive predictor of ECC [28].

Discussion

The review found that various parental factors, such as stress, attitude, and oral health knowledge, were associated with ECC in children. The studies included in the review examined the relationship between parental factors, such as stress, attitude, oral health knowledge, psychosocial factors, and environmental factors, and ECC. It is important to note that oral hygiene is influenced by multiple factors, and parenting style is one of these factors [24].

Children learn behavior from their parents [31]. The impact of parents on their children's health beliefs, behavior, and lifestyle can vary depending on a number of factors, including socio-economic status and gender [32]. The study shows parental occupation, knowledge, and behavior affected their child's health care. When parents are busy, they may try to spoil their children. "Increased frequency of sugar

consumption increases the risk of enamel demineralization and decreases time for remineralization by saliva.” [33]. While many studies have shown that individuals have positive knowledge and attitudes regarding dental health, it does not necessarily translate to good behavior in practice [34-37]. Also, knowledge about feeding practices in parents plays an important role in caries development. The healthy development of children is reliant on the essential immunological and nutritional components found in breast milk. Children who have never been breastfed or were breastfed for more than 24 months are reported to have an increased risk of ECC [38]. Sleeping with a bottle frequently may contribute to the development of caries as it can lead to decreased oral clearance due to low salivary flow rate during sleep time in infants, which increases the contact time of plaque and substrates [33] .

Parents’ attitude towards parenting also plays a major role in oral health. The oral hygiene of children raised in authoritative households was significantly better (9.4%) than that of children from permissive families, who showed no improvement. Additionally, the brushing frequency of children was found to be significantly associated with the parenting style adopted by their parents. Specifically, 26% of children raised by authoritative parents were reported to brush their teeth more than three times a day, whereas none of the children of permissive parents showed the same level of oral care. These results align with previous research highlighting the positive influence of authoritative parenting on children's oral hygiene practices, particularly with regards to tooth brushing [24]. We also found that a child experiencing dental caries was inversely

correlated to parental dental anxiety. Anxious parents were found to seek dental care in the early stages of caries to prevent the child from experiencing pain and as a result, it was found that those children have lesser caries [24].

It's unfortunate to hear that high levels of stress in families can have such negative impacts on children's dental hygiene and overall well-being. It's important for parents and families to recognize the potential effects of stress and take steps to address them. One approach to addressing this issue is to provide resources and support for parents and families to manage stress and promote healthy habits. This could include education and information about the importance of dental hygiene, as well as strategies for reducing stress, such as mindfulness techniques, exercise, and healthy eating. It may also be helpful to provide additional support and resources for families who are dealing with high levels of stress, such as counseling services or access to community resources. By providing these resources, families can better manage stress and promote healthy behaviors, including dental hygiene, in their children.

Another important step is to address any emotional problems or aggression that may be present in the family environment. This could involve seeking professional support, such as counseling or therapy, to help parents and families manage these issues and create a more positive home environment for their children.

Ultimately, addressing the impacts of stress on children's dental hygiene requires a comprehensive approach that addresses both the physical and emotional needs of parents and families. By providing support and resources, we can help ensure that

children have the best possible start to a lifetime of good dental health [39]. A significant correlation was observed between increased total parenting stress and certain demographic variables, such as lower educational attainment among female caregivers, being a single parent, and having a higher birth order of children [17]. A considerable number of parents reported that the stressors of their daily lives posed a significant obstacle to adequately prioritizing the dental health care needs of their children [17]. It is true that parental psychosocial factors can have a significant impact on children's oral health. The impact of various factors on the oral health of children has been investigated, with particular attention given to sense of coherence (SOC), oral health locus of control (LOC), and health behaviors [35, 25, 26]. Customized interventions have been developed with the aim of enhancing the oral health knowledge and behaviors of parents, with the ultimate goal of reducing early childhood caries (ECC).

Several researchers have reported a strong correlation between the education level and knowledge of mothers, which has been found to be associated with ECC and can ultimately influence the oral health of their children [40,41]. Along with education, SES has been widely documented as a risk factor

for the development of ECC [42]. The mother's education level was a predictor of the child's health, low education levels may lead to reduced income, unemployment, and poor occupational status.

Several limitations should be noted in this review. Firstly, only studies published in English were considered for inclusion, which may have led to the oversight of important work published in other languages. Secondly, the search was limited to PUBMED, which may not be used in some countries, potentially resulting in the omission of relevant studies. The review was limited to studies that were available in electronic format, and those that were only published in print were not considered. This may have restricted the breadth of the review.

Conclusion

This review focuses on research exploring the link between parental stress and the onset of ECC and consistently demonstrates the association between parental attitudes and oral health outcomes in children. Nevertheless, more comprehensive studies are needed to investigate the interplay between parental stress, oral health knowledge, health behaviors, and the development of ECC in children, to expand our knowledge in this area.

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