

The behavior of milk consumption based on the socioeconomic status of parents in the incidence of early childhood caries

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Abstract

Background: Dental caries in early childhood (ECC) is the presence of one or more damaged, missing or filled teeth. In Indonesia, the reported prevalence of ECC in children aged 5 years in Indonesia is 90.2%. The cause of high ECC is inappropriate milk giving to children, either bottled milk or breast milk, due to lack of knowledge of parents, especially mothers and involvement of socio-economic status.

Objective: This study aims to examine the relationship between breastfeeding habits based on the socio-economic status of parents with the incidence of Early Childhood Dental Caries.

Method: The method used is a literature review with a narrative review procedure.

Result: There are still many parents who do not understand about proper breastfeeding, this is influenced by socio-economic factors so that the prevalence of early childhood caries is still high.

Conclusion: Early Childhood Caries is caused by the habit of breastfeeding or formula milk, the level of knowledge of the parents, as well as the socioeconomic status of the family.

Keywords: Early childhood caries; Bottle feeding; Breastfeeding; Socioeconomic status

1. Introduction

Dental caries is a disease of tooth tissue that begins with damage to the tooth surface, from enamel to dentin, and then spreads to the pulp. The occurrence of tooth decay is caused by many processes and factors that interact with each other over time. There are four main factors that cause tooth decay, namely host, microorganisms, matrix and time[1]. The American Dental Association (ADA) and the American Academy of Pediatric Dentistry (AAPD) define early childhood caries as the presence of one more decayed, missing, or filled teeth (due to caries) in children aged 72 months (5 years 11 month) or younger, or children before the age of 6 years[2]. In Indonesia reported the prevalence early childhood caries for children aged 5 years to be 90,2. The habit of drinking milk before going to bed using a bottle for too long, as well as the habit of sucking candy and eating sweet foods can cause children to develop caries[3]. The pattern of giving breast milk for a long period of time or what is known as prolonged breastfeeding has a high potential risk of forming ECC (early childhood caries)[4]. Carbohydrates contained in breast milk (ASI) or formula milk, the length of contact of milk on erupted deciduous teeth, frequency, and method of administration cause breast milk or formula milk to pool around the surface of the teeth, especially when breastfeeding babies until they fall asleep[5]. The role of mothers who have a high level of oral health literacy (OHL) is considered to influence the condition of caries-free children and low caries prevalence[6], on the other hand, poor maternal knowledge was associated with higher delays in dental care in

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children[7]. In addition, socio-economic factors as the community and family levels, such as ethnicity and maternal education, are associated with the prevalence of ECC (early childhood caries)[8]. People with low socio-economic status have worse oral health status than those with higher socio-economic status [9]. This article aims to examine the relationship between milk-giving behavior based on parental socio-economic status on the incidence of Early Childhood Caries.

2. Methods

The method used is a literature review with a narrative review procedure. The data used in this study are secondary data. Articles or journals that meet the inclusion criteria are taken for further analysis. This literature review uses literature published in 2017-2022 that can be accessed in full text. Literature searches were conducted using Pubmed, Sciencedirect, ProQuest and Google scholar. The criteria for the journals reviewed are research journal articles in Indonesian and English. The types of articles used include research articles, original articles. Research journals that meet the inclusion criteria are collected and then the author takes reviews and summarizes several articles from relevant research results so as to create his own article as a result of the review / study.

3. Results and discussion

Based on the collected journals, answers to the research questions were obtained.

3.1. Early Childhood Caries

Historically, caries that develops after tooth eruption has been called caries praecox or nursing caries or labial caries or baby bottle tooth decay or comforter caries[2]. However, these terms do not precisely define the disease, but rather indicate the location of the lesion, the cause, or emphasize their onset in early childhood. The term Early Childhood Caries (ECC) was proposed at a workshop held by the National Institute for Dental and Craniofacial Research in 1999 to describe the disease occurring in the first 5 years of a child's life with or without causative factors[2]. Early Childhood Caries in the presence of one or more damage to teeth with or without cavities, tooth loss due to caries, or filling of the surface of primary teeth at preschool age (0-71 months)[10]. Early Childhood Caries (ECC) is referred to as atypical, rampant dental caries. The age and degree of decayed, missing, and filled tooth surfaces (dmfs) in primary teeth determine the diagnosis of ECC[11]. White demineralized patches on the cervical portion of the buccal or lingual surfaces of the maxillary front teeth are the initial indication of dental caries in newborns with ECC, but the mandibular incisors typically show no symptoms[12].

Early childhood caries (ECC) is a multifactorial illness with many biological, behavioral, and psychosocial risk factors that range from population to population and can combine in various ways to cause a caries lesion, children develop behavioral patterns that impact dental health, such as eating habits and oral cleanliness, and these patterns continue into childhood and adolescence[12]. The criteria for ECC are involvement of the 4 maxillary front primary teeth with or without involvement of the first primary molars, this happens as a result of the upper front primary teeth being exposed to sugar-containing liquids, such as formula and breast milk as seen in (figure 1)[13].



Figure 1 ECC in maxillary primary teeth and first molar[13]

Feeding during infancy also plays a major role, as teeth are more susceptible to caries after eruption[9]. In most children, infant feeding and toddler behavior (e.g., breastfeeding or bottle-feeding throughout the night) contribute to the occurrence of ECC [13], this causes carbohydrates to be fermented by bacteria, along with reduced salivary flow at night [9]. Bacteria-digested carbohydrates especially sucrose) cause a drop in Ph to 5 or lower. The power Ph leads to a so-called microbiome characterized by an increased proportion of acidic biofilm species and changes in biofilm matrix composition. Frequent exposure to sugars leads to sustained acid production and demineralization of the tooth structure[8]. Early Childhood Caries (ECC) development stage starts from new caries occurs on the smooth surface of the upper primary teeth in children aged 10-20 months, in the in the form of white demineralized spots or opaque or brown strips in the cervical third of the buccal and palatal surfaces of the upper incisors, parallel to the marginal gingiva. Second stage in 16-24 months, cavitation damages the enamel and reaches the dentin, causing the teeth to become soft and discolored, between the ages of 20-36 month, it is characterized by the appearance of deep carious lesions that destroy the pulp tissue and spread throughout the surface of the upper primary teeth, cavitation and mandibular first molars are noted. During the period between 30-48 months, there is significant simple caries in the upper canines and lowes molars, alog with substantial damage to the upper incisors and upper molars[14].

3.2. Mother/ Parent Attitudes about Milk Feeding

Breastfeeding is a critical and natural behavior, which can shape a person's life journey [15], according to WHO that initiation of breastfeeding immediately within 1 hour after birth, exclusive breastfeeding up to 6 months of age and continuing breastfeeding up to 2 years and breastfeeding is recommended according to demand or as often as the child wants during the day and night. At about 6 months of age, in addition to breast milk or formula milk, infants are introduced to solid foods and texture-appropriate feeding structures, by 1 year of age, all energy-containing foods and beverages should be given at 3 meals and 2 to 3 snacks [16].

Breast milk has superior nutritional composition and bioavailability, breast milk can increase remineralization due to its calcium and phosphate content [15], in al laboratory study by Rugg-Gunn (1985) breast milk can reduce plaque on teeth and melt well on enamel when compared to formula milk[17]. In a study conducted by Susi et al, 2019, children who receive exclusive breastfeeding have a lower deft index compared to children who do not receive it. There is a study in Iran on children aged 12-36 months stating that children who are given breast milk and formula milk have a risk of caries 2.1 times higher than children who are given breast milk alone, because breast milk contains lactoferrin, lysozyme and secretory immunoglobulin A (Sig A) which provide a protective effect against *Streptococcus mutans* bacteria[18]. According to Branger et al, 2019 breastfeeding up to 1 year of age is not associated with an increased risk of caries in children and can even protect teeth better than formula milk[19].

Feeding formula or breast milk can be a factor in the occurrence of early childhood caries seen from the length, frequency, duration, time of consumption and the addition of sugar in improper formula feeding[10]. There are studies that say that breast milk can increase the risk of caries when viewed from the frequency of breastfeeding, namely if the child is over the age of 12 months, 18 months, or 24 months[20, 21], based on this study that the increased risk of caries in children who are breastfed at the age of over 12 months is associated with foods consumed that have a high sugar content[22] and because the time spent breastfeeding is longer than bottle feeding, besides that children often fall asleep during breastfeeding [23]. The American Academy of Pediatric Dentistry (AAPD) also states that parenting patterns such as long-term formula feeding patterns, bottle feeding, frequency of feeding, and duration (the length of time milk is in contact with teeth) can cause caries in children[24].

3.3. Correlation between Parents' Socioeconomic Status and Milk Feeding

Socioeconomic factors are the most influential determinants of health. Socioeconomic status can be defined as the position of an individual or household in society, with a combination of occupation, education, income, wealth, and living environment[25]. There is a complex relationship between personal socioeconomic status and oral health. Studies have shown that people with low socioeconomic status have poorer oral health status than those with higher socioeconomic status and oral health deteriorates progressively from higher to lower socioeconomic status[26].

The occurrence of early childhood caries is influenced by the level of parental education, this is supported by research by Susi et al, 2019 that with highly educated mothers, their children have mild caries compared to mothers with low education. The level of education will make it easier to get information that will affect knowledge, attitudes and behavior in breastfeeding patterns, because the mother's education level is related to exclusive breastfeeding and breastfeeding patterns for her child[27]. Inadequate or unsuitable milk consumption practices in children lead to early childhood caries. Studies demonstrate that parental awareness is essential for the upkeep of children's oral hygiene, children are more likely to practice proper oral hygiene when their parents are more knowledgeable about dental health. According to a study, a lot of parents are ignorant about important facets of their kid's oral health, which can result in bad dental

consequences of them[28, 29]. Early childhood caries (ECC) and parental knowledge have a well-established association. According to a study, the prevalence of ECC in children ages three to five was significantly correlated with parents' awareness of preserving oral health. Better-informed parents were more likely to adopt good oral hygiene habits, which decreased the prevalence of dental cavities [30, 31].

According to Susi et al. 2019 that children who are more quickly in contact with drinks and food substitutes for breast milk experience caries more quickly. Judging from the socioeconomic status that many parents replace formula milk because of the expensive price with similar milk products with very high sugar content and low nutritional content[27]. Children's dental and oral health, especially regarding good habits such as brushing teeth in the right way and time after consuming sweet and sticky foods and drinks. Likewise with breastfeeding, if parents understand the frequency of time, and do not breastfeed during sleep, this will prevent early childhood caries [9].

4. Conclusion

From the description above, it can be concluded that the habit of giving breast milk or formula milk, family socio-economic factors, lack of parental knowledge about proper breastfeeding and lack of knowledge on how to maintain dental and oral health are the causes of the high prevalence of Early Childhood Caries.

Compliance with ethical standards

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Disclosure of conflict of interest

In accordance with ethical guidelines for publication, we, the authors of the manuscript titled The Behavior of Milk Consumption Based on the Socioeconomic Status of Parents in the Incidence of Early Childhood Caries, declare the following potential conflicts of interest:

- Talsha: I, Talsha, declare that I have no financial, personal, or professional relationships that could be perceived as potential conflicts of interest related to this manuscript. I have not received any funding or support from organizations that may have a vested interest in the findings of this study.
- Devy: I, Devy, also declare that I have no financial, personal, or professional relationships that could be considered conflicts of interest regarding this manuscript. Similar to my co-author, I have not received any funding or support from organizations that may have a vested interest in the outcomes of this study.

Both authors confirm that we have disclosed any relationships with institutions or products mentioned in the manuscript that are relevant to the research presented. We are committed to transparency and will continue to disclose any potential conflicts of interest that may arise in the future.

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