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## Original Article

# Association between breastfeeding and dental caries in Saudi preschool children

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## ABSTRACT

**Aims:** The objective of this study is to assess the potential association of breastfeeding and some other factors with the risk for early childhood caries (ECC) among young children in Saudi Arabia.

**Methods:** A cross-sectional study was conducted with male and female preschool children, aged between 30 and 66 months. A structured questionnaire was administered to the mothers to inquire about the feeding pattern of their children and to collect data about their socio-economic status. The data were modeled using a Chi square test with a significance level of 5%.

**Results:** ECC was observed in 89.66% of the children examined. The group most affected with caries was among the mixed breastfed group with 37.07% compared to 31.02% of those who were exclusively breastfed. Feeding practices showed the association between ECC and breastfeeding ( $P = 0.0004$ ) in children before 12 months of age. The relationship of parents, the mode of putting the child to sleep and the educational level of mothers were statistically related to the presence of ECC ( $P = 0$ ;  $P = 0.00001$ ;  $P = 0.00001$ ), respectively.

**Conclusions:** It is concluded that children who were breastfed by mixed breastfeeding experienced caries the most. The shorter duration of breastfeeding, educational level of the mothers, and relationship of parents are correlated with the etiology of ECC.

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## 1. Introduction and review

Dental caries (decay) is an international public health challenge, especially among young children. Early childhood caries (ECC) is a rapidly progressing disease leading to severe pain, anxiety, sepsis and sleep loss, and is a major health problem particularly for disadvantaged populations.<sup>1–3</sup>

Although the prevalence of dental caries in developed countries such as the US and Japan has declined over recent decades,<sup>4,5</sup> dental caries remain one of the most common infectious diseases among young children in developing countries. The microbiological process of dental caries has been well established.<sup>6</sup> The initiation and progression of caries occur due to the interaction of three factors: oral microorganisms, dietary carbohydrates, and tooth enamel.

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Microorganisms such as *Streptococcus mutans* colonize the tooth's surface, feed on incoming refined carbohydrates and produce acids, which result in demineralization of the tooth. Continuation of lower pH and loss of minerals undermine the tooth and cause permanent damage over time.

Organizations such as the World Health Organization (WHO), the American Academy of Pediatrics Dentistry (AAPD) and the Japanese Pediatric Society (JPS) recommend exclusive breastfeeding for at least 6 months because of the many benefits that breastfeeding provides.<sup>7-9</sup> However, breast milk contains sugars and may be cariogenic.<sup>10,11</sup> The pediatric dentistry organizations such as the AAPD and JPS referred to the potential risk of ECC associated with breastfeeding in their policy statements.<sup>12,13</sup>

Reviews of epidemiological studies have found the relationship between breastfeeding and ECC to be inconclusive.<sup>14,15</sup> Many studies suggest that breastfeeding may promote dental caries,<sup>16-21</sup> while other studies have not found an association.<sup>22-27</sup> Therefore, we sought to examine the association of breastfeeding during the first 2 years of life with dental caries between the ages of 30 and 66 months.

Thus, this study aims to determine the dental caries experience of children aged between 30 and 66 months to investigate how it relates to their breastfeeding practices.

Definition of Terms [WHO 1990]<sup>28</sup>:

- Exclusive Breast Feeding (EBF): an infant is exclusively breastfed if he or she is fed with human milk only on demand for the first 6 months of life to achieve optimal growth, development, and health.
- Predominant Breast Feeding (PBF): it refers to the use of only water or other non-nutritive liquids in addition to otherwise exclusive breastfeeding.
- Mixed Feeding (MF): it is used to indicate mixed feeding with breast-milk and other sources of energy and nutrient.

## 2. Objective

Despite limited epidemiologic evidence, concern has been raised that breastfeeding and its duration may increase the risk of ECC. The objective of this study was to assess the potential association of breastfeeding and some other factors with the risk for ECC among young children in Saudi Arabia.

## 3. Method and design

An official approval for the study was obtained from the Research Ethics Committee of the Ministry of Health, King Fahad Medical City, Riyadh, Kingdom of Saudi Arabia (KSA). The written and verbal consent was obtained from the General Directorate of Research and Studies Committee of Ministry of Health. Then, a cross-sectional study including young Saudi children in the Aseer region aged between 30 and 66 months was undertaken. Information on breastfeeding was obtained by means of a questionnaire. For this, a structured questionnaire was distributed among the mothers to gather information about the feeding patterns pertaining to their children and

to collect information regarding their socio-economic status. Children were classified as having caries if one or more deciduous teeth were decayed, missing, or had been filled at the time of examination. In all, 348 children participated in the study. All the children were examined by one examiner in natural light with the children seated on ordinary chair using sterile mouth mirrors and dental probes to remove debris and refute doubtful diagnosis. For accurate results, diagnosis criteria were adopted as those recommended by WHO.<sup>29</sup> Associations were subjected to the Chi square test and significance was defined as P less than or equal to 0.05.

## 4. Results

The final sample consisted of 204 boys (58.62%) and 144 girls (41.38%). The mean age of the children was 41 months. ECC prevalence in the population evaluated in this study was 89.66% while only 10.34% of them were caries free. The distribution of children according to age and sex is displayed in Fig. 1. The majority of mothers had less than 6 years of educational qualification. The educational level of mothers was statistically related to the presence of ECC  $\chi^2 = 306.27$ ,  $df = 4$ , and  $P < 0.05$  ( $P = 0.00001$ ), as shown in Fig. 2 and Table 1. The average monthly family income of the sample was set at SR 6000 (equivalent to US\$ 1600).

Of the 348 children participated in this study, only 10.34% had caries free and 84 (24.14%) had a dmft of 1 and 2. Moreover,

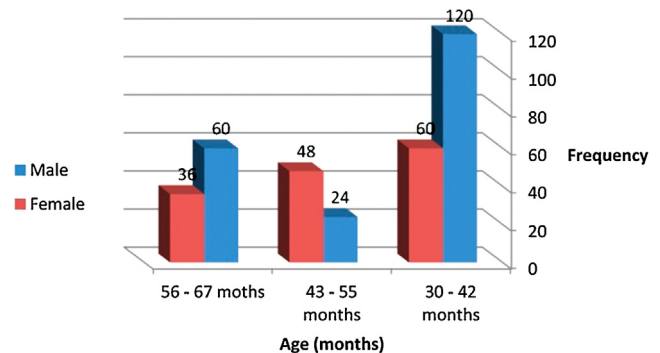


Fig. 1 – Distribution of children according to age and gender.

### Educational level of mothers and caries experience

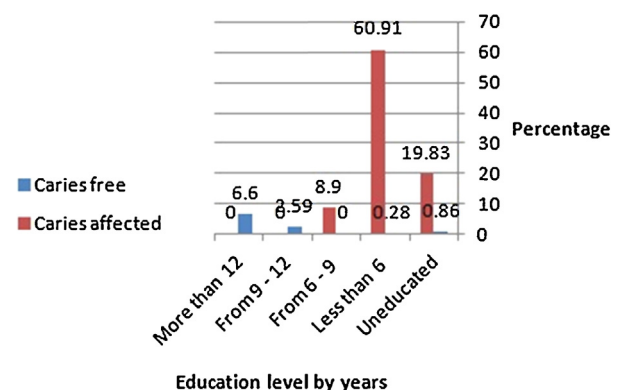


Fig. 2 – Educational level of mothers and caries experience.

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