International Journal of Nutrology
(Official Journal of the ABRAN - Brazilian Association of Nutrology)

REVIEW ARTICLE

DOI: 10.54448/ijn26S103

The importance of breastfeeding in bone development and oral health in children: a systematic review

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DOI: https://doi.org/10.54448/ijn26S103
Received: 12-15-2025; Revised: 02-16-2026; Accepted: 02-27-2026; Published: 02-28-2026; IJN-id: e26S103

Editor: Dr. Maria Cristina Jimenez Bazzano, MD, MsC.

Abstract

Introduction: The World Health Organization (WHO) recommends exclusive breastfeeding until 6 months or continued breastfeeding until 2 years or more. In addition to providing nutritional and immunological benefits, breastfeeding can aid in the development of breathing, swallowing, speech, chewing, and even help reduce early childhood caries. **Objective:** It was to present the main considerations of the importance of breastfeeding for children's oral health through a concise systematic review. **Methods:** The systematic review rules of the PRISMA Platform were followed. The search was conducted from October to December 2025 across the Web of Science, Scopus, Embase, PubMed, ScienceDirect, SciELO, and Google Scholar databases. The quality of the studies was assessed using the GRADE instrument, and the risk of bias was evaluated according to the Cochrane instrument. **Results and Conclusion:** According to the GRADE instrument, most studies presented homogeneous results, with X^2 = 80.4% > 50%. A total of 87 articles were found and submitted for eligibility analysis, with 12 final studies selected to compose the results of this systematic review. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 12 studies with a high risk of bias and 21 studies that did not meet GRADE and AMSTAR-2 standards. It was concluded that breastfeeding contributes to bone and muscle growth, leading to facial harmony, correct positioning of teeth and tongue, and aiding breathing and speech. The sucking action the baby needs to perform during breastfeeding stimulates the development of the jawbones. The child also develops nasal breathing and tongue positioning. However, current studies show that prolonged breastfeeding, beyond 12 months, may increase the incidence of tooth decay.

Keywords: Breastfeeding. Oral health. Caries. Tooth decay. Bone development.

Introduction

The Ministry of Health and the World Health Organization (WHO) recommend exclusive breastfeeding until 6 months or continued breastfeeding until 2 years or more **[1,2]**. In addition to providing nutritional and immunological benefits, breastfeeding can aid in the development of breathing, swallowing, speech, and even help reduce early childhood caries, which affects children up to six years of age. Evidence suggests that babies breastfed in the first year of life have less recurrence of dental caries compared to those who consume infant formula. By breastfeeding, the baby reduces inappropriate exposure to fluoride and avoids early consumption of sugars, directly impacting caries prevention **[3-6]**.

Breastfeeding is important and brings many benefits to oral health, but it is essential that caregivers take their children to receive appropriate dental care from an early age. According to the Primary Health Care Information System, the number of children who received their first dental consultation increased from 144,000 in 2022 to 180,000 in 2023. In Pará, 5,655 children had contact with a dentist for the

first time in 2022, and the following year, 6,258 consultations were recorded **[1]**.

Within the scope of the Unified Health System (SUS), pediatric dentistry is offered in Dental Specialty Centers. Basic Health Units have oral health teams that are qualified to care for children, including babies, providing guidance on breastfeeding practices **[1]**. Breastfeeding plays an essential role in the child's oral health, as it helps in the development of the jaw and facial muscles, contributing to the correct alignment of the teeth **[7,8]**.

Furthermore, breastfeeding promotes correct sucking, which is essential for the development of healthy habits and the formation of an adequate bite. Thus, studies encourage mothers to continue breastfeeding their babies with confidence **[5-8]**. However, the absence of breastfeeding or even early weaning results in a lack of stimulation for craniofacial development. In addition, the introduction of artificial nipples, such as bottles and pacifiers, moves a different musculature than the correct one, which can cause muscle hypertonia, altering the oral structure **[1,2,9]**.

From 6 months onwards, food introduction should begin slowly and gradually with natural products from different groups – fruits, vegetables, tubers, cereals, and beans. The consumption of sugars and ultra-processed foods is strongly contraindicated until 2 years of age, as they increase the risk of caries, asthma, allergies, obesity, and cardiovascular diseases in the future **[1,2]**.

Therefore, this study aimed to present the main considerations of the importance of breastfeeding for children's oral health through a concise systematic review.

Methods

Study Design

This study followed the international systematic review model, following the PRISMA (preferred reporting items for systematic reviews and meta-analysis) rules. Available at: http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1. Accessed at: 12/12/2025. The AMSTAR 2 (Assessing the methodological quality of systematic reviews) methodological quality standards were also followed. Available at: https://amstar.ca/. Accessed at: 12/12/2025.

Search Strategy and Search Sources

The literature search process was carried out from October to December 2025 and developed based on Web of Science, Embase, Scopus, PubMed, Lilacs, Ebsco, Scielo, and Google Scholar, covering scientific articles from various periods to the present day. The following descriptors were used in health sciences (DeCS/MeSH terms): *"Breastfeeding. Oral health. Caries. Tooth decay. Bone development"*, and the Boolean "and" was used between the MeSH terms and "or" between the historical findings.

Study Quality and Risk of Bias

Quality was classified as high, moderate, low, or very low regarding the risk of bias, clarity of comparisons, precision, and consistency of analyses. The most evident emphasis was on systematic review articles or meta-analyses of randomized clinical trials, followed by randomized clinical trials. Low quality of evidence was attributed to case reports, editorials, and brief communications, according to the GRADE instrument. The risk of bias was analyzed according to the Cochrane instrument by analyzing the Funnel Plot graph (Sample size versus Effect size), using Cohen's test (d).

Results and Discussion

Summary of Findings

A total of 87 articles were found and submitted to eligibility analysis, with 12 final studies selected to compose the results of this systematic review. The listed studies were of medium to high quality (Figure 1), considering the level of scientific evidence of studies such as meta-analysis, consensus, randomized clinical, prospective, and observational. Biases did not compromise the scientific basis of the studies. According to the GRADE instrument, most studies presented homogeneity in their results, with X^2=80.4%>50%. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 12 studies with a high risk of bias and 21 studies that did not meet GRADE and AMSTAR-2.

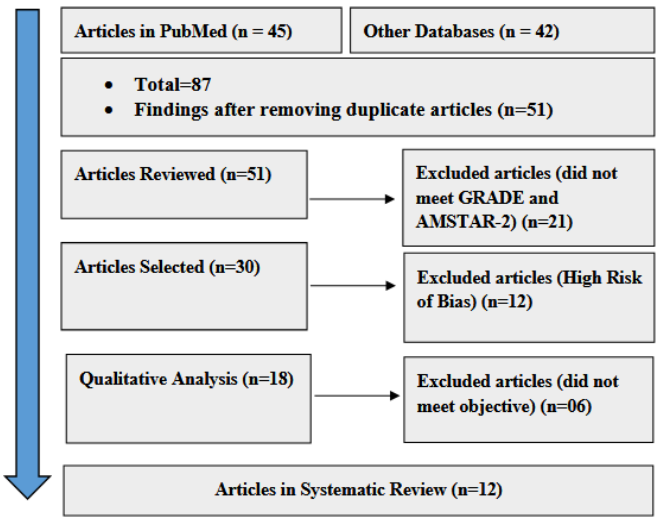

Figure 1. Flowchart showing the article selection process. Source: Own Authorship.

Figure 2 presents the results of the risk of bias of the studies using the Funnel Plot, showing the calculation of the Effect Size (Magnitude of the difference) using Cohen's Test (d). Precision (sample size) was determined indirectly by the inverse of the standard error (1/Standard Error). This graph did not have a symmetrical behavior, suggesting a significant risk of bias, both among studies with small sample sizes (lower precision) - red color - that are shown at the base of the graph and in studies with large sample sizes -black color - that are presented at the top.

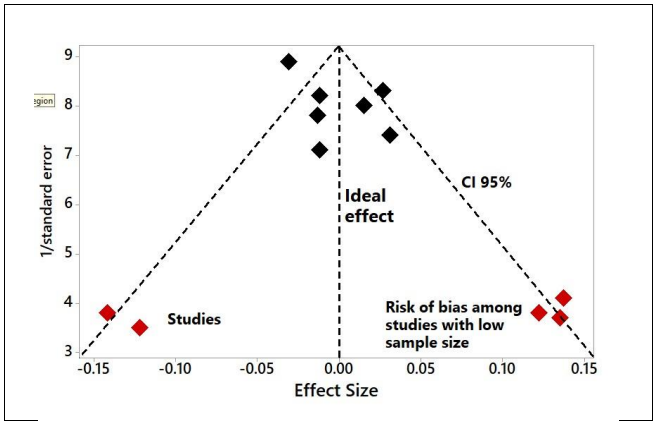

Figure 2. The non-symmetrical funnel plot suggests risk of bias among the studies with small sample sizes that are shown at the bottom of the graph. High confidence and high recommendation studies are shown above the graph (n=12 studies). Source: Own Authorship.

Major Considerations and Clinical Outcomes

The relationship between Dentistry and breastfeeding reinforces the importance of the dentist's participation as an encourager and integral part of the promotion of oral health. In April 2017, the National Congress sanctioned Law No. 13,435, establishing August as the month of breastfeeding and naming it Golden August **[1]**. The Federal Council of Dentistry, together with the Council System, reinforces the importance of the campaign to encourage breastfeeding in Brazil. For this, the Golden August Campaign alludes to milk, considered the "golden food" for babies in the first six months of life **[1]**.

Breastfeeding has been encouraged not only because breast milk is the most complete and digestible food for the baby, but also because of its immunizing action that protects it from various diseases. Furthermore, during breastfeeding, there is close contact between mother and child, strengthening the mother-baby bond, which is important for the child's psycho-affective development, helping them adapt to the outside world. In addition to these advantages, there are benefits directly related to oral health, which are still unknown to a significant portion of society **[2-5]**.

Breastfeeding contributes to the growth of bones and muscles, leading to facial harmony, correct positioning of teeth and tongue, and assisting breathing and speech. The sucking that the baby needs to perform during feeding stimulates the development of the jawbones, helping to project the baby's chin forward, which is a very important point, since it is born positioned a little backward. In addition, the child also develops nasal breathing and tongue positioning while breastfeeding **[6-9]**.

In addition to recruiting the right muscles for proper craniofacial development, breastfeeding contributes to the interaction of sucking, swallowing, and breathing functions, reduces the chances of acquiring harmful sucking habits, improves the quality of dental tissues, as breast milk is an important source of calcium and other minerals, promotes the development of the temporomandibular joint, strengthens the immune system for the overall health of the individual, and reduces the risk of caries. However, current studies show that prolonged breastfeeding can increase the incidence of caries disease **[9,10]**.

Given the impossibility of breastfeeding, it is necessary to prevent problems that are more prevalent in children who have not received this type of stimulation. It is necessary to seek a pediatric dentist to, in a multidisciplinary team, monitor the child's development and gather information. The lack of adequate stimulation of oral functions and sucking can cause some deviations or certain modifications in the development of the stomatognathic system, such as malocclusions, parafunctional habits, and mouth breathing. These can start to develop at very early ages, especially right after birth **[11,12]**.

Research has also observed that children with less time spent exclusively breastfed more frequently develop harmful oral habits, such as pacifier use and thumb sucking, and have seven times greater risk of acquiring these habits when compared to children who are breastfed **[11,12]**. The pediatric dentist, in their daily routine and planning, is the specialist responsible for the pregnant woman's prenatal dental care, in which the importance of maintaining oral health is addressed in an educational manner, emphasizing the need for the pregnant woman to make efforts to take care of her own oral health and to equip herself with information, as well as the support network for breastfeeding to occur **[9-11]**.

The authors Badrov, Matijević, and Tadin (2025) **[13]** showed that parents' knowledge about oral health plays a fundamental role in shaping their children's habits and in preventing caries in early childhood, mainly through breastfeeding and nutrition.

A cross-sectional online survey was conducted with 595 parents of children aged 3 to 6 years, using a self-administered questionnaire. Sociodemographic data, child characteristics, breastfeeding practices, daily diet, perception of the effects of diet on oral health, and reports of dental caries were collected. One-third of the children had dental caries. The prevalence of caries was significantly higher among children from rural areas (40.5%) compared to those from urban areas (31.1%) (p=0.021) and in low-income families (72.7%) compared to middle-income (35.4%) and high-income (25.1%) families (p=0.002). The duration of breastfeeding, bottle feeding, and nighttime feeding did not show a significant association with the occurrence of caries. Parental education on the impact of breastfeeding and nutrition on oral health may have a substantial effect on the prevention of dental caries in early childhood.

Finally, the authors Patnode et al. (2025) **[14]** analyzed the evidence on the association between breastfeeding and child health outcomes, including the extent to which these associations vary according to the intensity, duration, mode, and source of breast milk consumption. An association indicating a reduced risk with "more" versus "less" breastfeeding was most evident for otitis media, asthma, childhood obesity, and childhood leukemia. A protective association of breastfeeding was also found for severe respiratory and gastrointestinal infections in young children, allergic rhinitis, malocclusion, inflammatory bowel disease, type 1 diabetes, rapid weight gain and growth, systolic blood pressure, and infant mortality, including sudden unexpected infant death. There was no apparent association for the outcomes of atopic dermatitis, celiac disease, and cognitive ability. An association indicating an increased risk of dental caries was observed for breastfeeding for 12 months or more. There was insufficient evidence to draw conclusions about the relationship between food allergies and type 2 diabetes, and there was no data on coronavirus disease 2019 (COVID-19) or cardiovascular outcomes.

Limitations

Breastfeeding is associated with beneficial effects for several outcomes in infants and children, although there are limitations in the data that prevent high certainty in the conclusions. More research addressing the limitations of existing studies is needed to continue to inform the guidelines.

CONCLUSION

It was concluded that breastfeeding contributes to bone and muscle growth, leading to facial harmony, correct positioning of teeth and tongue, and aiding breathing and speech. The sucking action the baby needs to perform during breastfeeding stimulates the development of the jawbones. The child also develops nasal breathing and tongue positioning. However, current studies show that prolonged breastfeeding, beyond 12 months, may increase the incidence of tooth decay.

CRediT

Author contributions: **Conceptualization -** Lauani Beatriz de Souza, Keisy Miranda, Karoline Oliveira Bibiano, Leandro Moreira Tempest; **Investigation-** Lauani Beatriz de Souza, Keisy Miranda, Karoline Oliveira Bibiano, Leandro Moreira Tempest; **Methodology-** Lauani Beatriz de Souza, Keisy Miranda, Karoline Oliveira Bibiano, Leandro Moreira Tempest; **Project administration-** Lauani Beatriz de Souza; **Supervision-**Leandro Moreira Tempest; **Writing - original draft-** Lauani Beatriz de Souza, Keisy Miranda, Karoline Oliveira Bibiano, Leandro Moreira Tempest; **Writingreview & editing-** Lauani Beatriz de Souza, Keisy Miranda, Karoline Oliveira Bibiano, Leandro Moreira Tempest.

Acknowledgment

Not applicable.

Ethical Approval

Not applicable.

Informed Consent

Not applicable.

Funding

Not applicable.

Data Sharing Statement

No additional data are available.

Conflict of Interest

The authors declare no conflict of interest.

Similarity Check

It was applied by Ithenticate®.

Application of Artificial Intelligence (AI)

Not applicable.

Peer Review Process

It was performed.

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