



(REVIEW ARTICLE)



Efficacy of breastfeeding in Dentomaxillofacial development: Narrative review of the literature

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Abstract

Breastfeeding significantly influences dentomaxillofacial development and growth, especially during the first 6 months of life (1). It also prevents dental malocclusions, crowding, mandibular retrognathism, open bite, dental protrusion and improves the development of facial muscles (2). The objective of this study was to carry out a review of published articles that established the efficacy of breastfeeding in dentomaxillofacial development. Method: A critical review of the literature was carried out through a search in the databases: Scopus, Scielo and PubMed. Through a series of inclusion and exclusion criteria, a total of 12 articles were reviewed. Results: Although it is a matter of debate, it is determined that this act really helps in the development and dentomaxillofacial growth, it also acts as a preventive measure for the evolution of different anomalies. Conclusion: Breastfeeding is an effective method that favors the growth and development of craniofacial structures, stimulates muscle action through mechanical work, contributing to the correct positioning of the mandible and the transverse increase of the jaws for an adequate development of dental occlusion.

Keywords: Breastfeeding; Jaw; Development; Malocclusion; Dentition

1. Introduction

Dentomaxillofacial development refers to the growth and formation of the teeth, jaw, and related facial structures. It is a complex process that begins at birth and continues throughout childhood and adolescence. (1) The craniofacial complex plays an essential role in child growth, as it reveals the proper development of structures such as the brain. (1) Breastfeeding plays a fundamental role in this process, since it provides the baby with a series of biological and behavioral factors that contribute to the proper development of these structures.

First, sucking during breastfeeding involves a coordinated muscular effort that stimulates bone and muscle growth in the baby's jaw and face. This process helps the correct alignment of the teeth and promotes a balanced development of the face. In addition, suckling at the breast stimulates the development of the orofacial muscles, which facilitates chewing and speaking later in life. (1)

Breastfeeding also plays an important role in preventing dental problems such as malocclusion, which refers to a misalignment of the teeth and jaw. (2) Sucking at the breast requires a different effort than sucking on a bottle, which favors better development of facial muscles and a more appropriate position of the tongue during sucking. This can prevent problems such as an open bite or crossbite, which may require orthodontic treatment later in life. In addition, breast milk is the ideal food for the growth and development of the baby, since it provides all the necessary nutrients in

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the right amounts. The composition of breast milk is unique and adapts to the specific needs of the infant at each stage of development. Essential nutrients, such as proteins, vitamins and minerals, contribute to proper bone and dental development, strengthening the teeth and jaw structures. (2)

2. Materials and methods

This scientific article was developed using a descriptive research methodology. The collection of information was carried out through the search and selection of articles related to breastfeeding and its relationship with dentomaxillofacial and craniofacial development, in the Scopus, Scielo and PubMed electronic databases. Keywords such as breastfeeding, maxilla, development, malocclusion and dentition, were used in two different languages, English and Spanish. In addition, a search interaction was developed with the help of the Boolean operator "AND" and "OR", in which the keywords were related: breastfeeding, maxillary development, malocclusion and dentition.

The minimum requirement for the article to be eligible is that it is not older than 20 years, and that it does not involve dentomaxillary and craniofacial anomalies related to syndromes or trauma. The total number of articles collected through the selection by titles was 123, of which 77 were excluded due to reading the summary, with 46 articles selected for full review and 31 of which were excluded due to lack of relevant information for the investigation and per repetition, leaving a total of 12 articles to be used in the literature review.

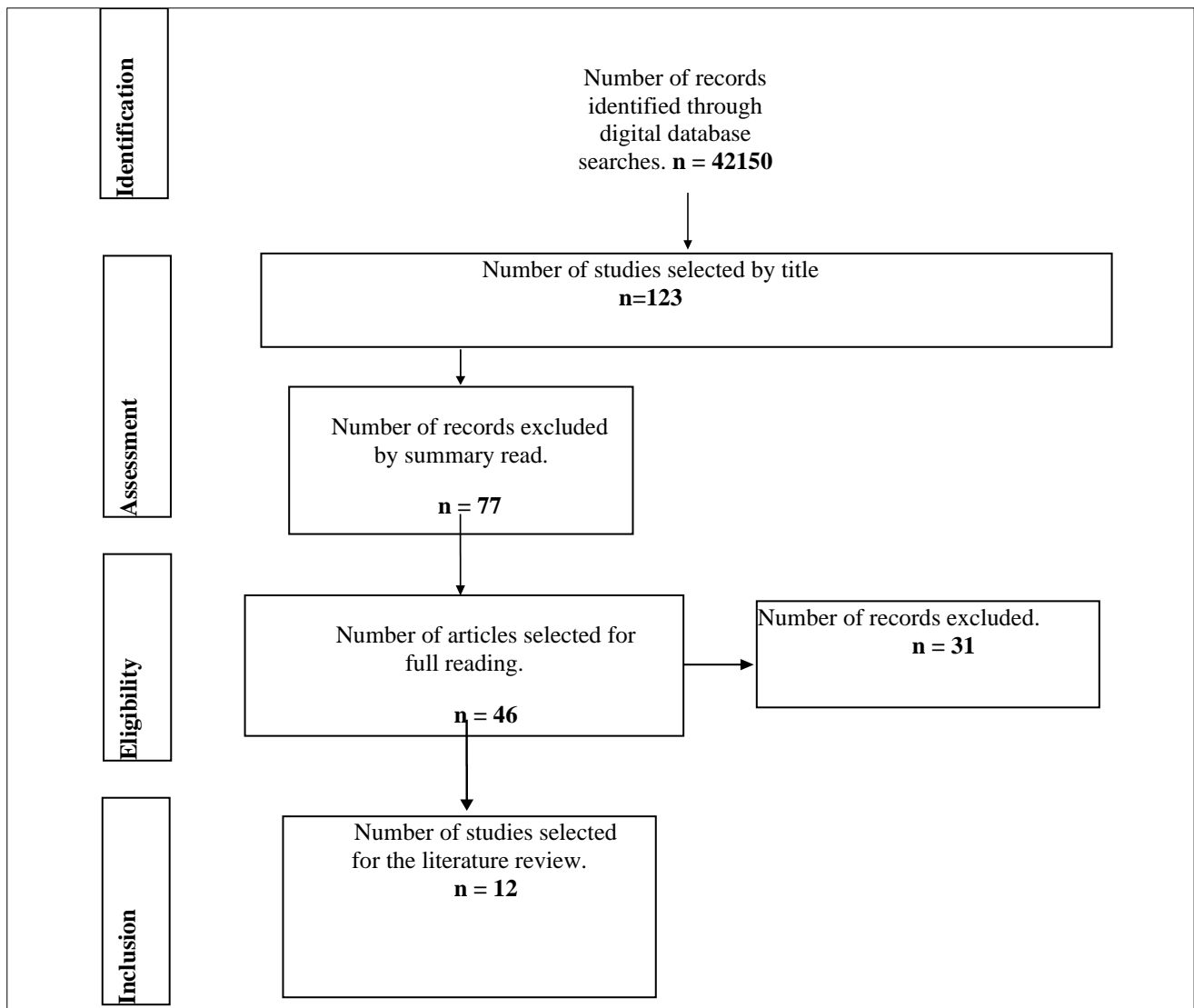


Figure 1 Flowchart. Selection of articles

Table 1 Selected Articles for the Literature Review

Title (year)	Objective	Type of study Methodology	Outcome measure	Conclusions
Effect of breastfeeding on malocclusions: a systematic review and meta-analysis (2015)	The aim of this systematic review was to investigate whether breastfeeding decreases the risk of malocclusion.	Meta-analysis	Forty-eight studies are included in the systematic review and 41 are included in the overall meta-analysis. Subjects who were ever breastfed are less likely to develop malocclusions than those who never breastfed (OR 0.34; 95% CI 0.24; 0.48), those who were exclusively breastfed had a lower risk of malocclusion than those who did not breastfeed exclusive breastfeeding (OR 0.54; 95% CI 0.38; 0.77), and subjects breastfed for longer periods of time are less likely to have malocclusions than those who breastfeed for shorter periods (OR 0.40; 95% CI).	Breastfeeding decreases the risk of malocclusion.
Infant oral motor function as a stimulus for craniofacial growth (2016)	To analyze the effects of oral motor function in infants on the proper development of craniofacial structures, taking into account the biological mechanisms and the type of feeding.	Literature review	An adequate oral motor function induces optimal craniofacial growth. The type of feeding is a determinant of growth. Breastfeeding is essential for optimal craniofacial growth and the prevention of dentomaxillofacial anomalies. The craniofacial form and function depend on the balance between the bony structural base and the muscular mechanical load.	Breastfeeding is the best technique to promote the growth and development of craniofacial structures, maturation of oral motor function in infants and the reduction of the incidence of malocclusion indicators. Craniofacial growth depends on a favorable bone and muscle condition.
Association between duration of breastfeeding and malocclusions in primary and mixed dentition: a systematic review and meta-analysis (2017)	To examine the current evidence on the possible effects of breastfeeding on different malocclusion traits in the primary and mixed dentition.	Systematic review and meta-analysis	The odds ratio for the risk of posterior crossbite was found to be 3.76 (95% CI 2.01-7.03) when comparing children who had not been breastfed with those who had been breastfed for more than six months, and increased to 8.78 (95% CI 1.67-7.03). 46. 1) when non-breastfed were compared with those breastfed for more than twelve months. The odds ratio for class II malocclusion in children breastfed up to six months compared to those breastfed for more than six months was 1.25 (95% CI 1.01 to 1.55). Finally, children who were breastfed for up to six months had an odds ratio of 1.73 (95% CI: 1.35-2.22) for non-spaced dentition compared with those who were breastfed for more than 6 months. six months.	Breastfeeding is a protective factor against posterior crossbite and class II malocclusion in primary and mixed dentition. The protective effect increases with the months of lactation.
Transverse diameter of the maxilla and harmful	To correlate breastfeeding with maxillary transverse	Descriptive observational	Exclusive breastfeeding represented the highest figure with 64.53% and the predominant period was longer than 6 months, (46.7%) followed by non-exclusive or	Breastfeeding, from the stomatological point of view, significantly contributes to the growth and development of the

oral habits in breastfeeding (2017)	diameter and the presence of harmful oral habits.	cross-sectional study	mixed breastfeeding 25.12%, 10.34% corresponding to artificial breastfeeding. 55.6% presented the normal transversal measurement determined by Bogué. The presence of harmful oral habits occurred in slightly more than half of the child population studied, 54.19%, 32.5% corresponding to non-exclusive and artificial breastfeeding. 42.86% of infants with exclusive breastfeeding were not committed to the practice of deforming habits.	masticatory apparatus. In exclusive breastfeeding it was found that deforming habits were lower.
Association of breastfeeding and malocclusion in 5-year-old children: Multilevel approach (2010)	To investigate the association between the proportion of children breastfed at the city level and the prevalence of malocclusion in the deciduous dentition at 5 years.	Cross-sectional analysis	The prevalence of malocclusion was 63.3%. The municipalities with the highest prevalence of breastfeeding between 9 and 12 months had a lower prevalence of malocclusion among 5-year-old children (PR 0.98; 95% CI 0.98-0.99).	Lower prevalence of malocclusion among 5-year-olds was associated with a higher proportion of children breastfed between 9 and 12 months at the city level, regardless of sociodemographic factors. These findings highlight the importance of promoting breastfeeding during the child's first year.
Maxillary alterations due to misadministration of breastfeeding in children with mixed dentition (2021)	The purpose of this investigation is to establish the alterations in the jaws due to misadministration of Breastfeeding, in children with mixed dentition, who attend the Dental Clinic.	Descriptive, analytical cross-sectional study	A prevalence of transverse micrognathism was found 59% absence of diastema 71%, and with a 67% presence of deep palatal vault, the most prevalent oral habit was onychophagia by 31%; there were similar percentages between interrupted lactation and adequate lactation; predominating prolonged lactation in 45%.	Transverse micrognathism is significantly present in the population studied; being more prevalent in females with an average age between 8 and 9 years. Interrupted breastfeeding produces transverse micrognathism, absence of physiological gaps, and presence of a deep palatal vault.
Breastfeeding, deleterious oral habits and malocclusion in 5-year-old children in São Pedro, SP, Brazil (2010)	To estimate the frequency of malocclusion and its associations with the type and period of lactation, deleterious oral habits and information received by mothers during the prenatal period, in 5-	Transversal study	The sample consisted of 162 children residing in the municipality of São Pedro, SP, Brazil. The following variables were evaluated: presence and severity of malocclusion [slight crowding and spacing (OS)], open occlusal relationship (open bite) (OPB), vertical overlap (overbite) (OVB), unilateral or bilateral crossbite (CB); positive overjet (OV) and terminal plane relationship (TPR) of the second primary molar. The prevalence of malocclusions was 95.7% (OS = 22.8%; OPB = 24.7%; OVB = 20.4%; CB = 14.8%; and OV =	The prevalence of malocclusions and deleterious oral habits in the studied sample was high. Children who used a pacifier for more than three years were more likely to have an open occlusal relationship (open bite).

	year-old children who attend municipal day care centers.		13.0%). In TPR the straight terminal plane predominated (85.0%). Among deleterious oral habits, pacifier use was the only risk indicator (OR = 5.25; p = 0.001) for open occlusal relationship (open bite) in children who used it for more than three years, detected in regressions. logistics. It was shown that the timing of exclusive breastfeeding influences the absence of harmful oral habits.	
Relationship of breastfeeding and non-nutritive sucking habits with dental malocclusion (2008)	Analyze the effects of breastfeeding on the development of the different structures that make up the stomatognathic apparatus, its preventive effect.	Transversal study	Of the 500 children studied, 250 were cases and 250 controls; 47% (n=235) men and 53% (n=265) women. Exclusive breastfeeding during the first six months of life represents a preventive factor for the development of malocclusion, OR of 0.09 with (95% CI 3.46-5.28). In contrast, bottle feeding carries an OR probability of malocclusion of 18.2 (95% CI 4.23 - 4.79). Likewise, a statistically significant association was found between non-nutritive sucking habits and malocclusion OR 24.57 (95% CI 2.55 - 3.01) during the first three years of life. According to the type of lactation, it was observed that in those children who were bottle-fed, 64% presented non-nutritive sucking habits. The most frequent non-nutritive sucking habit is finger sucking with 53%, with pacifier sucking representing lower percentages with 28% and other habits such as labial and lingual interposition with 19%.	Non-nutritive sucking habits and bottle feeding in the first months of life are the main risk factors for the development of malocclusions such as deep bite in deciduous dentition and Angle Class II in mixed dentition.
BREASTFEEDING AND ITS RELATIONSHIP WITH DENTOFACIAL ABNORMALITIES. LITERATURE REVIEW (2003)	To propose the effects of breastfeeding on the development of the different structures that make up the oral apparatus, and specifically its effect on dentofacial alterations.	Literature Review	Non specific.	Not specified After reviewing the literature, it can be concluded that breastfeeding, in addition to the multiple benefits it has on mother and child, is a very important stimulus in the development and growth of all the structures of the oral apparatus and the newborn respiratory system <ol style="list-style-type: none"> 1. Adequately maturing the functions of the oral apparatus 2. Producing the necessary development stimuli for maxillomandibular growth

				3. Prevents the establishment of vicious sucking and swallowing habits.
Influence of breastfeeding on the appearance of malocclusions in schoolchildren from 5 to 6 years of age (2014)	Assess the influence of breastfeeding on the transverse growth of the jaws, as well as on the appearance of deforming oral habits and, in fact, malocclusions.	Descriptive and cross-sectional study	In children with exclusive breastfeeding, malocclusions decreased considerably (20.0%) compared to those fed with combined breastfeeding (59.2%).	It is concluded that combined breastfeeding caused the appearance of these habits, which together with the little transverse development of the jaws could be related to the origin of the malocclusions.
Relationship between Breastfeeding and Malocclusion: A Systematic Review of the Literature (2020)	The purpose of this systematic review was to analyze the available literature on the influence of breastfeeding on the deciduous and mixed dentition in different types of malocclusions.	Systematic review of the literature	We searched the following electronic databases: Pubmed, Evidence-Based Medicine Reviews (EBMR), Embase, Cochrane Library, Medline, Web of Science, and Ovid. Results: A primary investigation found a total of 279 articles. Two more articles from the gray literature were also considered. 263 articles were excluded because they were considered irrelevant based on: duplicates, title, abstract, methods and/or irrelevant content. Eighteen articles were selected and included in the qualitative analysis.	Breastfeeding is a positive factor that seems to reduce the incidence of posterior crossbite, skeletal class II, and distocclusion in primary and mixed dentition. There seems to be something of a positive relationship between months of breastfeeding and risk reduction. More longitudinal research is needed to avoid bias in the results, with prospectively collected data on the months of exclusive breastfeeding, through specific questionnaires and successive clinical evaluation of the occlusal status in the stages of primary dentition, mixed dentition and permanent dentition.
Association of breastfeeding duration with the development of non-nutritive habits, and transversal and vertical occlusal alterations in preschool children: A cross-sectional study (2023)	The present study attempted to determine the relationship between the duration of breastfeeding and the development of non-nutritional habits, and transverse and vertical occlusal alterations in preschoolers.	Transversal study	A significant association was found between the duration of breastfeeding and the development of the habit of oral breathing; groups A and B showed a prevalence of 30.0% and 16.2%, respectively ($p = 0.048$). Likewise, the duration of lactation affected the occurrence of mouth breathing (OR (odds ratio) = 0.84; 95% CI (confidence interval): 0.74-0.96; $p = 0.011$). In addition, the use of a bottle for more than 24 months significantly influenced the appearance of oral habits (OR = 3.55; 95% CI: 1.20-10.55; $p = 0.022$) and open bite (OR = 12, 12, 95% CI: 1.16-126.31, $p = 0.037$).	The duration of breastfeeding from 6 to 12 months was shown to be a protective factor in preventing the onset of mouth breathing. Posterior crossbite (PCB), open bite, and deep bite do not seem to be influenced by duration of lactation. However, the use of a bottle for more than 24 months significantly influenced the appearance of anterior open bite.

3. Results

The results obtained from the study, according to the systematic review of articles published in an interval between 2003 - 2023 about breastfeeding and dentomaxillofacial development. The types of studies considered are classified as meta-analysis, literature review, descriptive, analytical, and cross-sectional systematic review. The articles selected for this bibliographic review with their main characteristics are shown in Table 1.

4. Discussion

The effects of breastfeeding on dentomaxillofacial development have been much debated, and it is often suggested that breast-feeding functions as a preventative measure in the formation or development of future dentofacial abnormalities. (1)

Sanchez et al. and Bravo et al. conclude that the newborn to suck and swallow milk performs protrusive and retrusive movements that stimulate the structures of the TMJ, growth and remodeling of the jaws; In addition, it favorably stimulates muscular action through mechanical work, which contributes to the correct positioning of the mandible and the transversal increase of the maxillae for an appropriate development of dental occlusion. (5)

Yuli Natalia et al. (2016), concludes that breastfeeding favors bone growth during dentomaxillofacial development as well as oral motor function and decreases the formation of dental malocclusions. (1)

Karen Glazer et al. (2015), conducted a systematic review and meta-analysis based on observational and intervention studies in which they concluded that breastfed subjects had a lower risk of developing malocclusion compared to those who were never breastfed. (3)

Montserrat Boronat et al. (2017), concluded that there is a relationship in children who are not breastfed up to 6 months, they present a posterior crossbite and class II malocclusion in the primary and mixed dentition. (4)

Nelya Sosa et al. (2017), concluded in their observational study that breastfeeding contributes to the growth and development of the masticatory apparatus, in addition to the fact that exclusive breastfeeding can lead to deforming habits such as prolonged use of the bottle. (5)

Patrícia Corrêa et al. (2018), in their cross-sectional analysis, concluded that malocclusion has a lower prevalence in 5-year-old children who have been breastfed between 9 and 12 months of life. (6)

Stephanie Calle et al. (2021), concluded in their cross-sectional study that the presence of transverse micrognathism, absence of physiological gaps and deep palate in children aged 8 to 9 years is related to interrupted breastfeeding and without the presence of oral habits. (7)

Alfredo Mendoza et al. (2008), concluded in their cross-sectional study that malocclusion such as deep bite in deciduous dentition and Angle class II in mixed dentition are due to risk factors such as non-nutritive sucking habits and bottle use in the first months of life. (9)

Elizabeth Merino et al. (2023), concluded that breastfeeding benefits the development and growth of the structures of the oral and respiratory apparatus in the newborn, such as their maturation, maxillomandibular growth, and prevents parafunctional sucking and swallowing habits. (10)

Rolando Vergara et al. (2014), concluded that breastfeeding combined with the appearance of habits such as protractile tongue and digital suction and little development of the jaws is related to malocclusions in children 5 to 6 years of age. (11)

Andrés Abad et al. (2020), conducted a systematic review and concluded that breastfeeding for 6 months or more reduces the risk of posterior crossbite and class II malocclusion in the primary and mixed dentition. However, there is no clear evidence that breastfeeding protects against other types of malocclusions such as vertical discrepancy such as open bite or deep bite. (12)

Ingrid Góngora et al. (2023), concluded that breastfeeding for 6 to 12 months helps prevent mouth breathing and the duration of breastfeeding is not related to the appearance of posterior crossbite, open bite and deep bite but it is related to open bite. with the use of the bottle for more than 24 months. (13)

5. Conclusion

Breastfeeding is a decisive factor for dentomaxillofacial development and growth, since it provides the baby with adequate biological and behavioral factors for this process. It also plays an important role in the prevention of dental problems such as malocclusions, promotes better development of facial muscles and a more correct position of the tongue during sucking. The findings of this study conclude that there is a significant correlation between breastfeeding with the transverse diameter of the upper jaw and the presence of harmful oral habits. In addition, it has a more beneficial impact than the use of a bottle on the growth and development of the craniofacial structure and when performing the actions of sucking, breathing and swallowing. Breastfeeding helps reduce the frequency of dental problems such as dental crowding, retrognathic jaw, tooth rotations, open bite, crossbite and tooth protrusion. Although it is recognized that breastfeeding is an effective and economical practice to prevent infectious diseases and malnutrition in the first year of life, it is necessary to carry out experimental studies to critically evaluate its influence on the prevention of problems in the development of jaws and other craniofacial structures.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to disclosed.

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