



ORIGINAL ARTICLE

## Association between breastfeeding and breathing pattern in children: a sectional study<sup>☆,☆☆</sup>



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### KEYWORDS

Breastfeeding;  
Mouth breathing;  
Respiration;  
Sucking behavior

### Abstract

**Objective:** to determine the prevalence of mouth breathing and to associate the history of breastfeeding with breathing patterns in children.

**Methods:** this was an observational study with 252 children of both genders, aged 30 to 48 months, who participated in a dental care program for mothers and newborns. As an instrument of data collection, a semi-structured questionnaire was administered to the children's mothers assessing the form and duration of breastfeeding and the oral habits of non-nutritive sucking. To determine the breathing patterns that the children had developed, medical history and clinical examination were used. Statistical analysis was conducted to examine the effects of exposure on the primary outcome (mouth breathing), and the prevalence ratio was calculated with a 95% confidence interval.

**Results:** of the total sample, 43.1% of the children were mouth breathers, 48.4% had been breastfed exclusively until six months of age or more, and 27.4% had non-nutritive sucking habits. Statistically significant associations were found for bottle-feeding ( $p < 0.001$ ) and oral habits of non-nutritive sucking ( $p = 0.009$ ), with an increased likelihood of children exhibiting a predominantly oral breathing pattern. A statistically significant association was also observed between a longer duration of exclusive breastfeeding and a nasal breathing pattern presented by children.

**Conclusion:** an increased duration of exclusive breastfeeding lowers the chances of children exhibiting a predominantly oral breathing pattern.

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**PALAVRAS-CHAVE**

Amamentação;  
Respiração bucal;  
Respiração;  
Comportamento de  
sucção

**Associação entre amamentação e padrão de respiração em crianças: estudo transversal****Resumo**

**Objetivo:** determinar a prevalência da respiração bucal e associar o histórico de amamentação com os padrões de respiração em crianças.

**Métodos:** este foi um estudo observacional com 252 crianças de ambos os sexos, com idades entre 30-48 meses, que participaram de um programa de assistência odontológica para mães e recém-nascidos. Como um instrumento de coleta de dados, foi entregue um questionário semiestruturado para as mães das crianças com perguntas sobre a forma e a duração da amamentação e os hábitos bucais de sucção não nutritiva. Para determinar os padrões de respiração desenvolvidos nas crianças, foram utilizados o histórico médico e o exame clínico. Foi realizada uma análise estatística para determinar os efeitos de exposição no principal resultado (respiração bucal), e o índice de prevalência foi calculado com um intervalo de confiança de 95%.

**Resultados:** do total da amostra, 43,1% das crianças apresentaram respiração bucal, 48,4% foram amamentados exclusivamente até os seis meses de idade ou mais e 27,4% apresentaram hábitos de sucção não nutritiva. Foram encontradas associações estatisticamente significativas para uso de mamadeira ( $p < 0,001$ ) e hábitos bucais de sucção não nutritiva ( $p = 0,009$ ), com um aumento da probabilidade de as crianças apresentarem um padrão de respiração predominantemente bucal. Também foi observada uma associação estatisticamente significativa entre uma maior duração do aleitamento materno exclusivo e um padrão de respiração bucal apresentado pelas crianças.

**Conclusão:** uma maior duração do aleitamento materno exclusivo diminui as chances de as crianças apresentarem um padrão de respiração predominantemente bucal.

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**Introduction**

Nutrition plays an important role in the growth and development of children. Maternal milk contains essential nutrients for newborns in the first months of life and has important functions in socioeconomic and psycho-emotional domains; exclusive breastfeeding is recommended for the first six months of life, and should be continued up to 2 years or more.<sup>1,2</sup>

The mechanics of breastfeeding in newborn are complex, and require the central nervous system to coordinate procedures for sucking, breathing, and swallowing.<sup>3,4</sup> Children who are exclusively breastfed (EBF) during the first months of life exhibit a physiological suction pattern with more sucking movements, and are better coordinated when compared to those who are artificially bottle-fed; this phenomenon occurs because the orofacial muscles are exercised less in formula-fed infants, making those muscles more flaccid and hypotonic.<sup>5</sup>

The movements of milking executed by infants when breastfeeding favor a balance in the perioral muscle forces, and are key factors for the proper growth of the bones and the orofacial muscles, promoting the normal development of the stomatognathic system.<sup>6,7</sup> When early weaning occurs, the child is unable to perform physiological movements and synchronized suction, and generally presents a tendency toward developing harmful habits, such as sucking a pacifier or the fingers, which can interfere in the process of nasal breathing.<sup>8</sup>

Breathing is a vital function of living organisms; in humans, breathing occurs physiologically through the nose.<sup>9</sup>

After birth, several factors can interfere with the regular breathing pattern; these factors can be conditional physical such as anatomical predispositions or can be present in the environment, in weather conditions, sleeping position, artificial feeding, and oral habits, including nonnutritive sucking.<sup>10</sup>

Mouth-breathing children are more predisposed to the development of facial changes, poor dental positioning, improper posture, and speech disorders.<sup>11</sup> These conditions can further develop and trigger cardiorespiratory, endocrine, learning, sleep, and mood disorders that significantly and negatively affect overall health and quality of life.<sup>5,12-14</sup> Studies have demonstrated that nose breathers have longer breastfeeding sessions, since the child keeps his/her lips sealed and lead up the tongue in a proper posture and as consequence establishes a correct pattern of breathing.<sup>15,16</sup> Studies that accurately examine this relationship are lacking.

The present study aimed to determine the prevalence of mouth-breathing in children, associated with the duration and type of breastfeeding.

**Methods**

This was an observational, cross-sectional, descriptive analytical study composed of children aged 30 to 48 months who participated in a maternal-infant dental care program called Preventive Program for Pregnant Women and Babies (PPGB). PPGB is an extension project of the dentistry course of the Universidade do Piauí in the Iniciativa Hospital Amigo

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