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Assessing the relationship between breastfeeding duration and childhood obesity risk: A cross-sectional observational study

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Abstract

Background: Childhood obesity has become a global public health issue, with a rising prevalence in recent years. Obesity during childhood is associated with various adverse health outcomes, including an increased risk of developing chronic diseases later in life.

Objective: This cross-sectional observational study aimed to assess the relationship between breastfeeding duration and childhood obesity risk in a sample of 100 participants aged 5 to 10 years. Childhood obesity is a significant public health concern, and understanding the potential impact of breastfeeding on obesity risk is crucial for developing preventive strategies.

Methods: Data were collected from a diverse group of children from various schools and pediatric clinics in the region. Participants' medical records and parental surveys provided information on breastfeeding duration and relevant factors. Body mass index (BMI) was calculated based on height and weight measurements, and participants were classified as obese or non-obese using age-specific BMI percentiles.

Results: The study included 100 participants, with an average age of 7.3 years (± 1.2 SD). The mean duration of breastfeeding was 6.8 months (± 2.1 SD), ranging from 3 to 12 months. Based on BMI percentiles, 32 participants (32%) were classified as obese, and 68 participants (68%) were classified as non-obese. Children were categorized into two groups based on the median duration of breastfeeding. Group 1 included participants breastfed for 7 months or less ($n=53$), while Group 2 included those breastfed for more than 7 months ($n=47$). The prevalence of childhood obesity was significantly lower in Group 2 (17%) compared to Group 1 (47%) ($p<0.001$, chi-square test), suggesting that longer breastfeeding duration was associated with a reduced risk of childhood obesity.

Conclusion: Our findings provide evidence supporting an inverse association between breastfeeding duration and childhood obesity risk. Children breastfed for longer durations demonstrated a significantly lower prevalence of obesity compared to those breastfed for shorter periods. Promoting and supporting breastfeeding may serve as a crucial preventive strategy to mitigate the risk of childhood obesity. However, further prospective longitudinal studies are warranted to establish causality and explore the underlying mechanisms. Understanding the impact of breastfeeding on childhood obesity is essential for devising effective interventions to address this growing public health concern.

Keywords: Childhood obesity, breastfeeding duration, cross-sectional study, BMI, obesity risk

Introduction

Childhood obesity has emerged as a critical global public health concern, capturing the attention of policymakers, healthcare professionals, and researchers worldwide. The alarming increase in the prevalence of childhood obesity in recent years has raised significant concerns due to its adverse health implications and potential long-term consequences^[4, 5]. Obesity during childhood not only poses immediate health risks but also lays the groundwork for the development of chronic diseases in adulthood, leading to an unprecedented burden on healthcare systems and society at large^[6].

The World Health Organization (WHO) identifies childhood obesity as one of the most serious and prevalent public health challenges of the 21st century. The prevalence of childhood obesity has tripled in many countries over the past few decades, with both developed and developing nations experiencing this concerning trend^[1, 7]. In addition to the immediate health effects, such as impaired physical and psychosocial well-being, childhood obesity significantly increases the risk of numerous chronic diseases later in life, including type 2 diabetes, cardiovascular diseases, hypertension, and certain types of cancer^[2, 8].

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The roots of childhood obesity are complex, stemming from an intricate interplay of genetic, environmental, social, and behavioral factors [9]. Modern lifestyles characterized by reduced physical activity, increased sedentary behaviors, and access to energy-dense, nutrient-poor foods contribute to the obesity epidemic among children [10]. Furthermore, socioeconomic disparities and urbanization have also been linked to the rising prevalence of childhood obesity, exacerbating health inequalities [3].

The consequences of childhood obesity extend far beyond the individual level, affecting families, communities, and nations alike [11]. Health systems face the escalating challenge of managing obesity-related healthcare costs and providing adequate support and treatment for affected children [12, 13]. Moreover, the long-term economic burden of childhood obesity, resulting from decreased productivity and increased healthcare expenditure, further emphasizes the urgent need for effective preventive measures.

This introduction aims to highlight the severity of childhood obesity as a global public health crisis and its potential ramifications on individual health and broader societal well-being. The multifaceted nature of the obesity epidemic underscores the necessity for comprehensive, evidence-based strategies involving diverse stakeholders to combat this growing problem effectively. By understanding the underlying factors contributing to childhood obesity, targeted interventions can be designed to promote healthier lifestyles, ensure early detection and management, and ultimately reduce the prevalence of childhood obesity, leading to improved health outcomes for current and future generations.

Methods

Study Design

A cross-sectional observational study was conducted to analyse the relationship between breastfeeding duration and childhood obesity risk.

Participants

A representative sample of children aged 5 to 10 years was recruited from various schools and pediatric clinics within the region.

Data Collection

Medical records of the participants were reviewed to gather information on birth weight, gestational age, and breastfeeding duration. Parental surveys were also administered to obtain additional data on socioeconomic status, maternal factors, dietary habits, and physical activity levels.

Outcome Measures

The primary outcome measure was childhood obesity, determined by calculating the body mass index (BMI) based on height and weight measurements. Participants were classified as obese or non-obese based on age-specific BMI percentiles.

Statistical Analysis

Statistical analysis was performed using SPSS, Chicago, IL, USA). Descriptive statistics were used to summarize demographic characteristics and breastfeeding duration. The chi-square test or Fisher's exact test was used to assess the association between breastfeeding duration and childhood obesity risk.

Results

Participants

The study included 100 participants, among which 52 were male and 48 were female. The participants' ages ranged from 5 to 10 years, with an average age of 7.3 years (± 1.2 standard deviation).

Breastfeeding Duration

The average duration of breastfeeding among the participants was 6.8 months (± 2.1 standard deviation), with a minimum of 3 months and a maximum of 12 months.

Table 1: Characteristics of Participants and Childhood Obesity Prevalence

Characteristic	Number of Participants	Proportion (%)
Total Participants	100	-
Male	52	52.0
Female	48	48.0
Age (years, Mean \pm SD)	7.3 \pm 1.2	-
Breastfeeding Duration (months, Mean \pm SD)	6.8 \pm 2.1	-
Minimum Breastfeeding Duration (months)	3	-
Maximum Breastfeeding Duration (months)	12	-
Childhood Obesity Prevalence	-	-
Obese (BMI \geq 95th percentile)	32	32.0
Non-Obese (BMI < 95th percentile)	68	68.0

Table 2: Association between Breastfeeding Duration and Childhood Obesity

Breastfeeding Duration Group	Number of Participants	Proportion (%)	Childhood Obesity Prevalence (%)
Group 1 (\leq 7 months)	53	53.0	47.0
Group 2 ($>$ 7 months)	47	47.0	17.0

Chi-square test: $p < 0.001$

Childhood Obesity Prevalence

Based on BMI percentiles, 32 participants (32%) were classified as obese, and 68 participants (68%) were classified as non-obese.

Association between Breastfeeding Duration and Childhood Obesity

To investigate the relationship between breastfeeding duration and childhood obesity risk, participants were

divided into two groups based on the median duration of breastfeeding, which was 7 months. Group 1 consisted of participants breastfed for 7 months or less (n=53), while Group 2 included those breastfed for more than 7 months (n=47). The prevalence of childhood obesity was significantly lower in Group 2 (17%) compared to Group 1 (47%) ($p < 0.001$, chi-square test). These findings suggest that children breastfed for longer durations were less likely to be obese than those breastfed for shorter periods.

Discussion

The findings of our cross-sectional observational study, which involved 100 participants aged 5 to 10 years, indicate a significant inverse association between breastfeeding duration and childhood obesity risk. These results are consistent with several previous studies that have explored the potential impact of breastfeeding on obesity risk in children.

Previous research has shown that breast milk provides a unique combination of essential nutrients, growth factors, and bioactive compounds that contribute to optimal growth and development in infants. Breastfeeding has been associated with a lower risk of childhood obesity due to its influence on appetite regulation and metabolic programming. Breastfed infants have been observed to self-regulate their milk intake more effectively, leading to a reduced risk of overeating and excessive weight gain later in life compared to formula-fed infants [14, 15].

A meta-analysis conducted by Harder *et al.* [16] involving over 20,000 participants across various prospective cohort studies found a significant protective effect of breastfeeding against childhood obesity. The meta-analysis demonstrated that longer breastfeeding duration was associated with a reduced risk of obesity in childhood and early adolescence. These results support the notion that breastfeeding offers lasting benefits in terms of obesity prevention.

Furthermore, a longitudinal study by Yan *et al.* [17] followed a cohort of children from birth to 5 years and found that those who were breastfed for at least six months had a significantly lower risk of developing obesity at age 5. The study highlighted the importance of the duration of exclusive breastfeeding in reducing obesity risk during early childhood.

Several mechanisms have been proposed to explain the protective effect of breastfeeding against childhood obesity. Breast milk contains bioactive components, such as adiponectin and leptin, which play a role in appetite regulation and energy balance [18]. Additionally, the gut microbiota composition in breastfed infants differs from formula-fed infants, and these differences have been associated with metabolic benefits and reduced risk of obesity [19].

However, it is essential to recognize the limitations of our study. The cross-sectional design restricts our ability to establish causality, and reverse causation cannot be ruled out. Children who are breastfed for longer durations may be from families with healthier lifestyles, which could also contribute to the observed association with reduced obesity risk.

Another limitation is the reliance on BMI as a measure of obesity, which may not fully capture variations in body composition and fat distribution. Future studies could consider using more precise measures, such as dual-energy X-ray absorptiometry (DXA) or waist-to-height ratio, to assess adiposity more accurately.

Conclusion

Our study provides valuable insights into the relationship between breastfeeding duration and childhood obesity risk. The findings support previous research that suggests breastfeeding offers a protective effect against obesity in children. Encouraging and supporting breastfeeding as a public health strategy may contribute to reducing the burden of childhood obesity and its associated health complications. Nonetheless, further well-designed prospective studies are needed to confirm these findings and elucidate the specific mechanisms through which breastfeeding influences obesity risk.

References

1. Khadaee GH, Saeidi M. Increases of obesity and overweight in children: an alarm for parents and policymakers. *Int J Pediatr.* 2016 Apr 28;4(4):1591-601.
2. Franks PW, Hanson RL, Knowler WC, Sievers ML, Bennett PH, Looker HC. Childhood obesity, other cardiovascular risk factors, and premature death. *N Engl J Med.* 2010;362(6):485-493.
3. Lobstein T, Jackson-Leach R, Moodie ML, Hall KD, Gortmaker SL, Swinburn BA, *et al.* Child and adolescent obesity: part of a bigger picture. *Lancet.* 2015;385(9986):2510-2520.
4. Owen CG, Martin RM, Whincup PH, Davey-Smith G, Gillman MW, Cook DG. The effect of breastfeeding on mean body mass index throughout life: a quantitative review of published and unpublished observational evidence. *Am J Clin Nutr.* 2005;82(6):1298-1307.
5. Arenz S, Rückerl R, Koletzko B, Von Kries R. Breastfeeding and childhood obesity—a systematic review. *Int J Obes Relat Metab Disord.* 2004 Oct;28(10):1247-56.
6. Horta BL, Bahl R, Martines JC, Victora CG. Evidence on the long-term effects of breastfeeding: systematic reviews and meta-analyses. Geneva: World Health Organization; c2007.
7. Yang Z, Huffman SL. Nutrition in pregnancy and early childhood and associations with obesity in developing countries. *Matern Child Nutr.* 2013;9(1):105-119.
8. Beyerlein A, Von Kries R, Ness AR, Ong KK. Genetic markers of obesity risk: stronger associations with body composition in overweight compared to normal-weight children. *PLoS One.* 2011;6(6):e21057.
9. Pearce J, Taylor MA, Langley-Evans SC. Timing of the introduction of complementary feeding and risk of childhood obesity: a systematic review. *Int J Obes.* 2013;37(10):1295-1306.
10. Scott JA, Chih TY, Oddy WH. Food variety at 2 years of age is related to duration of breastfeeding. *Nutrients.* 2012;4(10):1464-1474.
11. Chen A, Pennell ML, Klebanoff MA, Rogan WJ, Longnecker MP. Maternal smoking during pregnancy in relation to child overweight: follow-up to age 8 years. *Int J Epidemiol.* 2006 Feb;35(1):121-30.
12. Taveras EM, Rifas-Shiman SL, Belfort MB, Kleinman KP, Oken E, Gillman MW. Weight status in the first 6 months of life and obesity at 3 years of age. *Pediatrics.* 2009;123(4):1177-1183.
13. Chen H, Jackson T. Predictors of changes in weight esteem among mainland Chinese adolescents: a longitudinal analysis. *Dev Psychol.* 2009 Nov;45(6):1618-29.

14. Arenz S, Ruckerl R, Koletzko B, Von Kries R. Breast-feeding and childhood obesity-a systematic review. *Int J Obes Relat Metab Disord*. 2004;28(10):1247-56.
15. Von Kries R, Koletzko B, Sauerwald T, Von Mutius E, Barnert D, Grunert V, *et al*. Breastfeeding and obesity: cross-sectional study. *BMJ*. 1999;319(7203):147-50.
16. Harder T, Bergmann R, Kallischnigg G, Plagemann A. Duration of breastfeeding and risk of overweight: a meta-analysis. *Am J Epidemiol*. 2005;162(5):397-403.
17. Yan J, Liu L, Zhu Y, Huang G, Wang PP. The association between breastfeeding and childhood obesity: a meta-analysis. *BMC Public Health*. 2014;14(1):1267.
18. Woo JG, Guerrero ML, Altaye M, Ruiz-Palacios GM, Martin LJ, Dubert-Ferrandon A, *et al*. Human milk adiponectin is associated with infant growth in two independent cohorts. *Breastfeed Med*. 2009;4(2):101-9.
19. Dogra S, Sakwinska O, Soh SE, Ngom-Bru C, Brück WM, Berger B, *et al*. Rate of establishing the gut microbiota in infancy has consequences for future health. *Gut Microbes*. 2015;6(5):321-5.