

Breastfeeding and Physical Activity in U.S. Children: Influence of Socioeconomic Factors

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Keywords: Breastfeeding, Socioeconomic Factors, Physical Activity, U.S. Children

<https://doi.org/10.55070/001c.144551>

Physician's Journal of Medicine

Vol. 4, 2025

Introduction

Breastfeeding confers early-life health benefits, while physical activity supports long-term physical and cognitive well-being. Whether breastfeeding duration influences later physical activity remains unclear. This study evaluated the association between breastfeeding duration and physical activity in U.S. children.

Methods

We analyzed data from the 2021–2022 National Health and Nutrition Examination Survey (NHANES). Children aged 2–17 years with complete data on breastfeeding history, physical activity, demographics, and socioeconomic status were included (n = 538). Breastfeeding duration was categorized as <2 months, 2–6 months, 6–12 months, or ≥12 months. The outcome was the number of days per week the child engaged in ≥60 minutes of activity. Multivariable linear regression adjusted for age, gender, race/ethnicity, and household poverty-income ratio.

Results

The mean number of active days per week was 5.36 (SD = 1.83). After adjustment, breastfeeding duration was not significantly associated with physical activity. Compared with <2 months, activity levels did not differ among children breastfed for 2–6 months ($\beta = -0.27$, $p = 0.36$), 6–12 months ($\beta = -0.26$, $p = 0.35$), or ≥12 months ($\beta = -0.26$, $p = 0.33$). White children were more active than Black children ($\beta = 0.999$, $p < 0.001$), and children from upper middle-income households were more active than those below poverty ($\beta = 0.79$, $p = 0.024$).

Conclusion

Breastfeeding duration was not independently associated with physical activity among U.S. children. Racial and socioeconomic disparities were stronger predictors, underscoring the importance of addressing structural barriers to promote activity in youth.

INTRODUCTION

Breastfeeding is widely recognized as a foundational component of early childhood health, offering a range of benefits that extend beyond infancy. The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life, followed by continued breastfeeding alongside complementary foods for up to two years or beyond.¹ Breastfeeding has been associated with reduced risks of infections, obesity, type 2 diabetes, and improved cognitive development.^{2,3}

Physical activity during childhood is similarly vital, contributing to physical, mental, and social well-being. Regular physical activity improves cardiovascular fitness, strength-

ens bones and muscles, supports healthy weight maintenance, and enhances coordination.⁴ Additionally, physical activity has been linked to improved academic performance and emotional regulation.⁵

Despite the well-documented independent benefits of breastfeeding and physical activity, the potential long-term behavioral relationship between early-life feeding practices and later physical activity remains underexplored. Several studies have examined this association, with some suggesting that longer breastfeeding duration may be linked to improved physical fitness outcomes, such as muscle strength and cardiorespiratory capacity.^{6,7} Other research has found no such association after adjusting for key confounding variables,⁸ reflecting inconsistency in the current literature and highlighting the need for further investigation.

Clarifying whether early-life nutrition influences health behaviors like physical activity is essential for public health. Physical activity habits formed in childhood tend to persist into adolescence and adulthood,^{8,9} and the developmental importance of early activity is emphasized in national health guidelines and policy frameworks.

METHODS

We conducted a cross-sectional analysis, with Institutional Review Board (IRB) approval, using publicly available data from the 2021–2022 cycle of the National Health and Nutrition Examination Survey (NHANES), a nationally representative survey administered by the National Center for Health Statistics. Data from the Demographics, Child Feeding, Physical Activity, and related modules were merged using the unique participant identifier (SEQN). The study sample included children aged 2 to 17 years with complete data on breastfeeding history, physical activity, gender, race/ethnicity, age, and household poverty-income ratio.

The primary exposure was breastfeeding duration, derived from caregiver-reported responses (variable DBD030), and categorized as <2 months, 2–6 months, 6–12 months, or ≥12 months. Children still being breastfed or with implausible responses were excluded. The outcome was the number of physically active days per week, based on PAQ706, which measures the number of days in the past week the child engaged in at least 60 minutes of physical activity. This was analyzed as a continuous variable ranging from 0 to 7.

Covariates included gender (male, female), race/ethnicity (Black [reference], White, Hispanic), age in years (continuous), and household poverty-income ratio categorized as below poverty (<1.0; reference), low income (1.0–1.99), middle income (2.0–3.99), upper middle income (4.0–4.99), and high income (≥5.0).

We used descriptive statistics to characterize the population and conducted multivariable linear regression to assess the association between breastfeeding duration and physical activity, adjusting for covariates. Statistical significance was defined as two-sided $p < 0.05$. Analyses were performed using R version 4.3.2.

RESULTS

The final sample included 538 children, of whom 51.9% were male. In terms of race/ethnicity, 36.4% identified as White, 38.8% as Black, and 24.8% as Hispanic. Reported breastfeeding duration was <2 months in 18.2% of children, 2–6 months in 24.2%, 6–12 months in 28.3%, and ≥12 months in 29.4%. The mean number of physically active days per week was 5.36 (SD = 1.83).

[Table 1](#) presents participant characteristics stratified by breastfeeding duration. Males accounted for a slightly higher proportion in the 2–6 month and <2 month categories, while females predominated in the 6–12 month category. Children from higher income households were more commonly found in longer breastfeeding categories. White children were more likely to have been breastfed for longer

durations, with 60.5% of those breastfed ≥12 months identifying as White.

In adjusted analyses, breastfeeding duration was not significantly associated with physical activity. Compared to children breastfed for <2 months, those breastfed for 2–6 months ($\beta = -0.27$, $p = 0.36$), 6–12 months ($\beta = -0.26$, $p = 0.35$), and ≥12 months ($\beta = -0.26$, $p = 0.33$) did not show statistically significant differences in the number of active days per week.

White children were significantly more active than Black children, averaging 0.999 more physically active days per week ($p < 0.001$). Children from upper middle-income households were also more active compared to those below poverty ($\beta = 0.79$, $p = 0.024$). Female children were slightly less active than males ($\beta = -0.28$, $p = 0.08$), though this difference did not reach statistical significance. Age and other income categories were not significantly associated with physical activity.

DISCUSSION

In this nationally representative sample of U.S. children, we found no significant association between breastfeeding duration and number of physically active days per week after adjusting for sociodemographic variables. These findings contrast with some prior studies that suggested longer durations of breastfeeding may be positively associated with later physical fitness measures such as cardiorespiratory endurance or muscular strength.^{6,7} Our results align more closely with research that, after accounting for confounding variables, has found no clear relationship between breastfeeding and later physical activity behaviors.⁸

While breastfeeding has well-established benefits for early growth, immunity, and metabolic health,^{1,2} our findings suggest that it may not be a strong independent predictor of behavioral outcomes such as physical activity in childhood. This distinction is important because it highlights the complexity of the determinants of physical activity, which are likely shaped more directly by environmental, cultural, and psychosocial factors during later stages of development. These include parental modeling, access to safe recreational space, school-based physical education, and screen time—factors not captured in this dataset.

Interestingly, we observed that White children and those from upper middle-income households reported more physically active days per week compared to Black children and those below the poverty line. These findings are consistent with known disparities in access to physical activity resources and opportunities.^{9,10} Previous research has shown that socioeconomic status and neighborhood safety are strongly associated with physical activity levels in children, particularly in urban settings where play space may be limited.¹⁰ Addressing these disparities remains an important target for public health policy.

The marginally lower activity among female children ($p = 0.08$) also mirrors well-established trends in pediatric health behavior literature. Girls tend to report lower levels of physical activity than boys across childhood and adolescence, a pattern that emerges as early as preschool.¹¹

Table 1.

	<2 months	2-6 months	6-12 months	12+ months
Male	34 (54.0%)	69 (62.2%)	65 (46.1%)	113 (50.7%)
Female	29 (46.0%)	42 (37.8%)	76 (53.9%)	110 (49.3%)
Below Poverty	10 (15.9%)	26 (23.4%)	24 (17.0%)	43 (19.3%)
Low Income	25 (39.7%)	38 (34.2%)	32 (22.7%)	46 (20.6%)
Middle Income	18 (28.6%)	29 (26.1%)	42 (29.8%)	60 (26.9%)
Upper Middle Income	3 (4.8%)	8 (7.2%)	9 (6.4%)	21 (9.4%)
High Income	7 (11.1%)	10 (9.0%)	34 (24.1%)	53 (23.8%)
Black	14 (22.2%)	19 (17.1%)	20 (14.2%)	24 (10.8%)
Hispanic	13 (20.6%)	41 (36.9%)	50 (35.5%)	64 (28.7%)
White	36 (57.1%)	51 (45.9%)	71 (50.4%)	135 (60.5%)

Interventions to close this gender gap—such as tailoring programs to support social motivation, inclusivity, and non-competitive activity—may be more impactful than relying on early-life nutritional exposures to drive physical activity differences.

Our study has several strengths, including the use of a large, nationally representative dataset and objective categorization of breastfeeding duration and physical activity frequency. However, it is not without limitations. First, the cross-sectional design precludes causal inference. Second, both breastfeeding duration and physical activity were reported by caregivers or participants and may be subject to recall bias. Third, we did not have access to environmental or behavioral variables (e.g., screen time, parental physical activity, school policies), which could confound or mediate the relationship between breastfeeding and physical activity.

CONCLUSION

In this nationally representative study, breastfeeding duration was not significantly associated with physical activity levels among children aged 2 to 17 years. While early-life nutrition plays a vital role in child development, our findings suggest that factors such as race and socioeconomic status have a stronger influence on physical activity behaviors. Efforts to promote physical activity in youth may be more effective if they focus on addressing structural and environmental barriers rather than relying on early nutritional exposures alone.

Submitted: July 25, 2025 EDT. Accepted: September 09, 2025 EDT. Published: September 17, 2025 EDT.



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REFERENCES

1. World Health Organization. Continued breastfeeding for healthy growth and development of children. Accessed June 5, 2025. <https://www.who.int/tools/elena/bbc/continued-breastfeeding>
2. Horta BL, Loret de Mola C, Victora CG. Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: a systematic review and meta-analysis. *Acta Paediatrica*. 2015;104(S467):30-37. doi:[10.1111/apa.13133](https://doi.org/10.1111/apa.13133)
3. Horta BL, de Mola CL, Victora CG. Breastfeeding and intelligence: a systematic review and meta-analysis. *Acta Paediatrica*. 2015;104(S467):14-19. doi:[10.1111/apa.13139](https://doi.org/10.1111/apa.13139)
4. Healthdirect Australia. Benefits of physical activity for children. Accessed June 5, 2025. <https://www.healthdirect.gov.au/benefits-of-physical-activity-for-children>
5. Donnelly JE, Hillman CH, Castelli D, et al. Physical activity, fitness, cognitive function, and academic achievement in children: a systematic review. *Med Sci Sports Exerc*. 2016;48(6):1197-1222. doi:[10.1249/MSS.0000000000000901](https://doi.org/10.1249/MSS.0000000000000901)
6. Zaqout M, Michels N, Ahrens W, et al. Associations between exclusive breastfeeding and physical fitness during childhood. *European Journal of Nutrition*. 2018;57. doi:[10.1007/s00394-016-1337-3](https://doi.org/10.1007/s00394-016-1337-3)
7. Labayen I, Ruiz JR, Ortega FB, et al. Exclusive breastfeeding duration and cardiorespiratory fitness in children and adolescents. *Am J Clin Nutr*. 2012;95(2):498-505. doi:[10.3945/ajcn.111.023838](https://doi.org/10.3945/ajcn.111.023838). PMID:22237059
8. Vinke PC, Tigelaar C, Küpers LK, Corpeleijn E. The Role of Children's Dietary Pattern and Physical Activity in the Association Between Breastfeeding and BMI at Age 5: The GECKO Drenthe Cohort. *Matern Child Health J*. 2021;25(2):338-348. doi:[10.1007/s10995-020-03063-6](https://doi.org/10.1007/s10995-020-03063-6). PMID:33258042
9. Armstrong S, Wong CA, Perrin E, Page S, Sibley L, Skinner A. Association of Physical Activity With Income, Race/Ethnicity, and Sex Among Adolescents and Young Adults in the United States: Findings From the National Health and Nutrition Examination Survey, 2007-2016. *JAMA Pediatr*. 2018;172(8):732-740. doi:[10.1001/jamapediatrics.2018.1273](https://doi.org/10.1001/jamapediatrics.2018.1273). PMID:29889945
10. Engelberg JK, Conway TL, Geremia C, et al. Socioeconomic and race/ethnic disparities in observed park quality. *BMC Public Health*. 2016;16(1):395. doi:[10.1186/s12889-016-3055-4](https://doi.org/10.1186/s12889-016-3055-4)
11. Kretschmer L, Salali GD, Andersen LB, et al. Gender differences in the distribution of children's physical activity: evidence from nine countries. *Int J Behav Nutr Phys Act*. 2023;20:103. doi:[10.1186/s12966-023-01496-0](https://doi.org/10.1186/s12966-023-01496-0)