Breastfeeding and Pediatric Obesity in America

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Purpose

- Rates of breastfeeding remain extremely low nationwide in reference to current empirical and government recommendations. Less than 1/3 of US women continue to breastfeed their infants at age 12 months.[1]
- Rates of childhood obesity in America are at an ever-increasing high, leading to short- and long-term adverse health effects. Over 25% of children in the US are overweight or obese. [2]
- The purpose of this review is to synthesize the findings of multiple empirical studies to form a comprehensive picture of the protective effect of breastfeeding on rates of childhood obesity, including various protective factors, their functions, and limitations.

Methods

Articles were obtained through MEDLINE and CINAHL databases between December 2016 and June 2018. Criteria for inclusion in this review comprised empirical studies with peer-reviewed status, publication in the English language, a publication date within the last ten years unless seminal in nature, and relevant content addressing breastfeeding, pediatric obesity, or both as interrelated. Twenty-eight studies which met these criteria were initially identified and synthesized to develop the content of this project.

Results

- Breastfed babies naturally store fat in infancy, and these stores decline around weaning. In formula-fed babies, the opposite happens: at age 12 months, formula-fed babies have much greater fat deposits than breast milk-fed peers. Body composition seen in early childhood often remains stable into adulthood.[2]
- On average, breastfed infants have lower body mass indexes (BMIs) in adulthood; formula-fed infants have higher mean BMIs.[3]
- High protein content in most artificial infant formulas contributes to childhood obesity. Exclusive breastfeeding counters this effect, and partial breastfeeding is also helpful.[4]
- Infants breastfed at least partially for 9 months have a 36% reduction in later excessive fat deposition. Partial breastfeeding protects in a manner less than, but relatively similar to, exclusive breastfeeding.[5]
- *Bifidobacterium* colonies, likely transmitted through breast milk, are less diverse in formula-fed infants' guts. This lack of early gut flora diversity is implicated in childhood obesity, and may be a main difference between breastfed and formula-fed infants.[6]
- US women are not consuming more fat, but more of their fat intake is made up of alpha linolenic fatty acid, which has been linked to greatly increased obesity in breastfed mice.[7]
- Hormones such as leptin and ghrelin are naturally transmitted in breast milk. This transmission is linked to greater infant appetite regulation and lower rates of obesity.[8]
- The protective effects of breastfeeding against adiposity are greatest in non-Hispanic white women.[9]
- Almost 50% of low socio-economic status babies are predominantly formula-fed, compared to less than 28% of middle/high-SES babies. Babies predominantly breastfed are 250% less likely to be obese at age 2 years than formula-fed peers.[10, 11]
- Infants fed at the breast learn intake control, as do their caregivers. Whether fed breast milk or formula, bottle-fed babies are more likely to be obese in adulthood than breast-fed peers.[12]

Conclusions

- Breastfeeding is an empirically-supported way to provide childhood and lifelong protection against obesity.
- Body composition in very early childhood is likely to remain stable through adulthood.[2]
- Infants who are breastfed continuously for at least 9 months gain the greatest protection from excessive fat deposition.[3]
- Partial breastfeeding confers nearly the same protection against obesity as exclusive breastfeeding. Predominant breastfeeding is preferred.[5]
- Adiposity-protective benefits of breastfeeding are heavily mediated by race and socio-economic status. [10,11]

Implications

Childbearing women of all races, socioeconomic statuses, and body types should be provided with comprehensive education regarding the benefits of breastfeeding to both mom and baby. The registered nurse should act as an advocate, educator, and resource-giver in assisting women to make decisions regarding the use of breastfeeding in conferring protective short- and long-term benefits to their infants. Further research is needed to more clearly identify the etiology of the disparities seen in the correlation between breastfeeding and pediatric obesity among various racial and socioeconomic groups.

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References

1. National Center for Chronic Disease Prevention and Health Promotion (CDC). (2016).
2. Gale, C., Logan, K. M., Santhakumaran, S., Parkinson, J. R. C., Hyde, M. J., & Modi, N. (2012).
3. Owen, C. G., Martin, R. M., Whincup, P. H., Davey-Smith, G., Gillman, M. W., & Cook, D. G. (2005).
4. Patro-Gołąb, B., Zalewski, B. M., Kołodziej, M., Kouwenhoven, S., Poston, L., Godfrey, K. M … Szajewska, H. (2016).
5. Harder, T., Bergmann, R., Kallischnigg, G., & Plagemann, A. (2005).
6. Soderborg, T. K., Borengasser, S. J., Barbour, L. A., & Friedman, J. E. (2016).
7. Alihaud, G., & Guesnet, P. (2004).
8. Savino, F., Fissore, M. F., Liguori, S. A., & Oggero, R. (2009).
9. Ehrenthal, D. B., Wu, P., & Trabulsi, J. (2016).
10. Gibbs, B. G., & Forste, R. (2013).
11. DiSantis, K. I., Collins, B. N., Fisher, J. O., & Davey, A. (2011).
12. Bartok, C. J., & Ventura, A. K. (2009).