# THE EFFECTS OF BREASTFEEDING ON REDUCING THE RISK OF CHILDHOOD OBESITY


## Abstract

Breast milk contains essential nutrients that can provide protection to children from future diseases and conditions, including obesity. The primary objective of this review was to compare a compilation of studies in which researchers evaluated the effects of exclusive breastfeeding on childhood obesity. The primary research articles reviewed were found using PubMed. Contradicting results were found from the studies reviewed and therefore suggest that more research must be conducted in order to draw a definite conclusion. Some researchers concluded that breastfeeding did not provide protection against childhood obesity. Other researchers determined that breastfeeding could reduce the risk of childhood obesity. Although results are contradicting, researchers discussed other benefits of breastfeeding such as increased immunity and cognitive development.

## INTRODUCTION

The composition of breast milk contains ideal amounts of protein, fat, carbohydrates, and vitamins for an infant. This ideal composition provides the proper nutrients needed for infant development and stimulates the gastrointestinal tract and immune system.[1] Experts recommend exclusive breastfeeding for the first six months, followed by solid foods combined with breast feeding for up to two years or older.[2] The first six months of breastfeeding is both beneficial to the mother and baby. One benefit currently being researched is breast milk's ability to reduce the risk of childhood obesity. Researchers hypothesized that breastfeeding allows infants to better respond to hunger and satiety cues. Learning these cues early during development could help establish better long-term eating habits to prevent childhood obesity.[3]

In 2010, more than one third of children and adolescents were considered overweight or obese.[4] Childhood obesity can lead to long-term effects that hinder a child's growth and development. Overweight children are more likely to develop cardiovascular disease, diabetes, cancer, and other health complications.[4] As childhood obesity becomes an epidemic, researchers are exploring ways to prevent childhood obesity. Specifically, research has been conducted to determine if breastfeeding during infancy can reduce the risk of childhood obesity.[5-12] If researchers could conclude that breastfeeding reduces the risk of childhood obesity, then mothers could help reduce their child's risk for obesity and other health complications that would follow.

The primary purpose of this review is to discuss the results of multiple studies in order to determine if breastfeeding can reduce the risk of childhood obesity. Each study was published in a peer-reviewed journal and these studies were the most recent research conducted, each done within the last fifteen years. The experiments vary in their results and in this review studies will be compared to draw an overall conclusion about the effects of breastfeeding on childhood obesity.

## METHODS

The research articles used in this review were found using PubMed. Using the advanced search tool, the search terms "breastfeeding," "children," and "obesity" were searched. The advance search looked for titles with these three terms. The search resulted in 75 articles. To narrow the search, only primary research and articles within the past fifteen years were examined. Fifty articles were found that fit these specific criteria. Articles were chosen based on relevance to breastfeeding and the prevention of childhood obesity. In the studies chosen, a comparable number of positive and negative results were found. In the following review, nine articles will be discussed, four articles with negative results and five articles with positive results.

This review will first analyze the articles that found no association between breastfeeding and the risk of childhood obesity. The second part of this review will analyze the articles that found a positive correlation between breastfeeding and childhood obesity. After analyzing both viewpoints, a conclusion will be drawn about the overall effects of breastfeeding on obesity.

## RESULTS/DISCUSSION

Researchers have studied the benefits of breastfeeding and have shown that breastfeeding can benefit both the mother and baby.[5] Although, recent research conducted by Michels et al.[6] disproved that breastfeeding can reduce childhood obesity. Researchers administered a survey to 35,526 participants. The participants' mothers provided past information on feeding as an infant. The mothers were asked the duration of breastfeeding and bottle-feeding and the type of formula used. Weight and height were recorded for the participants at ages five, ten, eighteen and current weight. Research showed that exclusive breastfeeding for the first six months resulted in a smaller body shape by age five. Unfortunately, this trend did not continue throughout adolescence and adulthood and the relationship between breastfeeding and obesity was no longer significant after the age of five. From this study, researchers concluded that those who were breastfed for several months had a lower risk of being obese during childhood but breastfeeding did not prevent the later onset of obesity in adolescence or adulthood.[6]

Similar to this survey, Li et al.[7] used data from the British birth cohort study in order to gather information about participants offspring. The participants were 3,077 children, both male and female and ranged from 4-18 years of age. Data was collected on the duration of breastfeeding and the child's body mass index (BMI). After comparing all data, no relationship was found between breastfeeding and childhood obesity. Therefore, researchers concluded that breastfeeding has no protective effect on obesity later in life.[7]

While some studies found no correlation between breastfeeding and childhood obesity, other studies showed an association when specific factors, like smoking, were considered. Two studies found a similar factor where breastfeeding reduced the risk for obesity in childhood. In both studies, if the mother refrained from smoking during pregnancy, then breastfeeding was shown to reduce the child's risk for obesity.[3,8] Bogen et al. discussed four factors where breastfeeding reduced the risk for childhood obesity. The four factors were (1) duration of breastfeeding, (2) concurrent formula feeding, (3) child's race, and (4) mother's smoking status during pregnancy.[7] Although factors were found where breastfeeding would reduce the risk of obesity, researchers concluded that due to a large variant of factors, there is not an overall protective effect of breastfeeding on childhood obesity.[3,8]

Although negative results exist, similar studies have shown that breastfeeding can have an overall protective effect on childhood obesity. One study compiled information from the National Health and Nutrition Examination Survey III (NHANES III). The mothers were asked questions regarding the child's feeding as an infant. Questions focused on if the child was ever breastfed and the age the child completely stopped breastfeeding. Also, mothers were asked when other formulas and foods were incorporated. BMI was used as the primary measuring tool to place children into a growth percentile. This study found a significant, 37 percent, reduction in being at risk for obesity for children ever breastfed and only a 16 percent reduction for children who were never breastfed.[9] Hence, in this specific study, ever breastfeeding reduced the child's risk of developing obesity.

Similar to this study, Weyermann et al.[10] conducted a cohort study on women from the Department of Gynecology and Obstetrics at the University of Ulm in Germany. These women and their newborns were selected based on gestational age and birth weight. Data was collected for 722 children; weight and height were recorded and BMI was calculated in order to place children into a growth percentile. After analyzing the data, researchers found that the risk for being overweight was decreased for children who were breastfed for at least six months. Children who were breastfed for less than three months were at a higher risk for being

overweight.[10] This study shows that breastfeeding for a longer duration, six months, can provide protection against childhood obesity.

Many studies focused on the duration of breastfeeding and found that children who were breastfed for at least six months were at a lower risk for being overweight.[10-12] Toschke et al.[11] researched breastfeeding in association with BMI and fat mass. Subjects were taken from the Avon Longitudinal Study of Parents and Children (ALSPAC). ALSPAC is a longitudinal birth cohort study that focused on development, health, and diseases during childhood. Subjects from ALSPAC were asked to participate by completing a questionnaire asking about duration of breastfeeding. Height, weight, and body composition were measured and BMI was calculated. However, when researchers just looked at BMI, no association was found between breastfeeding and obesity. However, when researchers looked at duration of breastfeeding, evidence showed that breastfeeding for at least six months reduced the risk for being overweight. From this evidence, researchers determined that longer durations of breastfeeding could provide protection again future obesity.[11]

Also looking at breastfeeding duration, Gillman et al.[12] surveyed participants in the Growing Up Today Study, a nationwide study on diet, exercise, and growth. About 15,000 boys and girls were surveyed and their mothers received a questionnaire. This questionnaire focused on the prominence of breastfeeding within the first six months of life and on the duration of breastfeeding. Height and weight were measured and BMI was calculated for each participant. Results showed that children who were mostly breastfed during the first six months of life had a 22% lower risk of being overweight. Also, researchers found that those who were breastfed for at least seven months had a 20% lower risk of being overweight than those who were breastfed for only three months.[12] After comparing the articles that focused on duration of breastfeeding, most found that a longer duration of breastfeeding was more beneficial and could lower the risk of being overweight. All articles concluded that breastfeeding for greater than six months provided protection from being overweight during childhood.[10-12]

In conclusion, due to the conflicting results of each study, it is difficult to draw an overall conclusion as to whether breastfeeding can reduce the risk of childhood obesity. The studies that found negative correlation could not draw conclusive results because too many factors had to be considered.[6-8] These variables included maternal weight, age of mother, environment, ethnicity, gender, and many others. The studies that found a positive correlation focused mainly on duration of breastfeeding in relation to childhood obesity. These studies found that six months was the ideal time period to exclusively breastfeed an infant.[9-12] After comparing the results of each study, a weak conclusion could be made that although variables can affect the outcomes, breastfeeding exclusively for at least six months may lower the risk for being overweight. Researchers are not positive of the effects of breastfeeding on obesity but no negative effects were seen and therefore breastfeeding for a longer duration would not hurt the infant. In order to draw a more concrete conclusion, further research should be conducted in order to determine if breastfeeding can reduce the risk of childhood obesity.

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