



## CHAPTER 1

# Scientific Evidence Supporting Breastfeeding

Becky Spencer

### OBJECTIVES

- Describe the current evidence for the health benefits of breastfeeding for infants.
- Describe the current evidence for the health benefits of breastfeeding for lactating parents.
- Describe the current evidence for the impact of lactation support on the initiation and duration of breastfeeding.

### DEFINITIONS OF COMMONLY USED TERMS

**exclusive breastfeeding** When an infant receives no other food or drink except breastmilk for the first 6 months of life. Oral rehydration solutions and medicines or vitamins in liquid form are not considered other food or drink.<sup>1</sup>

**lactation support provider** Any individual who is trained, certified, or licensed to provide breastfeeding education, support, and care within the specific scope of practice defined by training, certification, or licensure.

**malocclusion** Misalignment of the upper and lower teeth causing an irregular bite, cross bite, or overbite. In severe cases, malocclusion can impact a person's speech or ability to eat.

**meta-analysis** A quantitative statistical analysis of several separate but similar studies to test the pooled data for statistical significance.

**necrotizing enterocolitis (NEC)** A condition that typically occurs in the 2nd to 3rd week of life in preterm, formula-fed infants; it is characterized by damage to the intestinal tract. NEC has a high rate of mortality, reaching 50 percent or more depending on the severity.

**peer support** Lactation support that is delivered by individuals who have common life experiences with the people they are serving.

**sudden infant death syndrome (SIDS)** A sudden and unexpected death, whether explained or unexplained, that occurs during infancy.

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**DEFINITIONS OF COMMONLY USED TERMS***(continued)*

**systematic review** A detailed and strategic search strategy, evaluation, and summary of the results of available quantitative studies; provides a high level of evidence on the effectiveness of healthcare interventions.

**technology-mediated support** Technology platforms that are used by lactation support providers to deliver education, care, and support. Examples of technology platforms include social media sites, mobile applications, videoconferencing, and telehealth.

**► Overview**

The decision to breastfeed an infant is influenced by a multitude of information sources. Influences in parents' decisions include personal connections with partners, family members, and friends; connections with healthcare providers, hospitals, and clinics; and connections with social media, internet resources, and various marketing mediums in television, print, and radio. It can seem daunting to parents to sort through all the different messages about breastfeeding and differentiate valid, trustworthy, and useful information from false and misleading information. Helping parents make informed decisions about infant feeding and supporting optimal breastfeeding to meet individual goals should be the top priority of all lactation support providers.

Lactation support providers include a growing diverse interdisciplinary team of healthcare providers including physicians, nurses, midwives, registered dietitians, public health professionals, scientists, lactation consultants, peer counselors, and lay community health workers. These providers share a common commitment to promoting the health of families through breastfeeding education, care, and support. The interdisciplinary nature of lactation support is a strength, yet providing consistent messaging that is valid, trustworthy, and useful across disciplines can be challenging. The purpose of this chapter is to present the most recent evidence from scientific literature regarding the benefits of breastfeeding for infants and lactating parents. The most recent evidence demonstrating the benefits of lactation support is also presented. Providing consistent breastfeeding information using an evidence-informed foundation from all interdisciplinary perspectives will decrease contradictory messaging and increase consistent messaging to assist families in making sound infant feeding decisions. Studies cited in this chapter were conducted in low-, middle-, and high-income countries worldwide.

Any use of the term *mother*, *maternal*, or *breastfeeding* is not meant to exclude transgender or nonbinary parents who may be breastfeeding their infant.

**I. Health Benefits of Breastfeeding for Infants and Children**

- A. Breastfeeding is protective against respiratory infections.
  1. Health benefits of breastfeeding for infants and children are reported in systematic reviews and meta-analyses of scientific literature.
  2. In one systematic review, any breastfeeding (exclusive or partial) reduced the risk of hospitalization and mortality.<sup>2</sup>
  3. Another systematic review reported that infants younger than 1 year who were exclusively breastfed for 4 months or longer had an overall reduced risk of hospitalization from lower respiratory tract infections, compared to formula.<sup>3</sup>
- B. Breastfeeding may be associated with a reduced risk for developing asthma.
  1. One meta-analysis of three prospective cohort studies of fair-quality evidence concluded that any breastfeeding for at least 3 months was associated with a reduced risk for asthma.<sup>3,4</sup>
  2. Some evidence from cohort studies concluded that there is an increased risk of asthma and allergy with breastfeeding.<sup>5,6</sup>
- C. Breastfeeding is protective against gastrointestinal infections and diarrhea.
  1. Breastfeeding has demonstrated substantial protection against morbidity and mortality from diarrhea.<sup>2,3,7</sup>
  2. Protection from diarrhea appears to be dose related, with exclusive breastfeeding providing more protection.<sup>2</sup>

- D. Breastfeeding lowers the risk for the incidence of acute otitis media (AOM). Children who were breastfed longer (more than 4 or 6 months, compared to less than 4 or 6 months in respective studies) had a significantly reduced risk for the incidence of AOM.<sup>3,7,8</sup>
- E. Breastfeeding lowers the risk for the incidence of dental caries.
  - 1. Children who are breastfed have less risk of developing dental caries than children who are fed nonhuman milk from a bottle.<sup>9</sup>
  - 2. There is a lower risk of developing dental caries the longer children are breastfed, up to 12 months of age.<sup>10</sup> An increased risk of developing dental caries was associated with breastfeeding longer than 12 months. The increased risk is possibly attributed to night feedings and poor oral care after feedings in breastfed infants and toddlers.
- F. Breastfeeding lowers the risk for incidence of malocclusion.
  - 1. Children who were breastfed were less likely to present with malocclusions than children who were never breastfed.
  - 2. The longer infants were breastfed, the less likely they were to present with malocclusions.<sup>11</sup>
- G. Breastfeeding lowers the risk for the incidence of NEC for preterm infants. In neonatal intensive care units where the parent's expressed milk or donor human milk is used with preterm infants, NEC is significantly decreased.<sup>3,12,13</sup>
- H. Breastfeeding lowers the risk for incidence of SIDS.
  - 1. Any breastfeeding is associated with a significantly reduced risk of SIDS.<sup>3,14-16</sup>
  - 2. The protective effect of breastfeeding against SIDS is strongest with exclusive breastfeeding.<sup>15</sup>
- I. Breastfeeding lowers the risk for the incidence of developing childhood leukemia. Breastfeeding for longer than 6 months was associated with a reduced risk of acute lymphocytic leukemia.<sup>3,17</sup>
- J. Breastfeeding may be associated with a reduced risk of obesity.
  - 1. Early research that explored the relationship of breastfeeding to obesity in later childhood did not account for confounding variables, selection reporting, or publication bias.<sup>3</sup>
  - 2. A systematic review found that breastfeeding was associated with decreased obesity in childhood, adolescence, and adulthood.<sup>18</sup> The researchers controlled for socioeconomic status, maternal body mass index, and perinatal morbidity.
- K. Breastfeeding may be associated with a reduced risk of developing diabetes.
  - 1. A nonstatistically significant reduced risk for developing Type 2 diabetes later in life was found with infants who were ever breastfed.<sup>18</sup>
  - 2. A review of six studies concluded that breastfeeding could reduce the risk of developing Type 1 diabetes, but the retrospective nature of the studies could have introduced recall bias, which decreases the trustworthiness of the results.<sup>3</sup>
- L. Breastfeeding may be associated with higher performance on intelligence tests in childhood and adolescence.
  - 1. In a meta-analysis that controlled for maternal intelligence, children who were ever breastfed scored an average of 3.4 points higher on intelligence tests than children who were never breastfed.<sup>19</sup>
  - 2. A review of eight studies that examined the association of breastfeeding and intelligence found little to no evidence for an association between breastfeeding and intelligence in later childhood.<sup>3</sup>

## II. Health Benefits of Breastfeeding for Lactating Parent

- A. Breastfeeding lowers the risk for the incidence of developing breast cancer.
  - 1. Multiple systematic reviews and meta-analyses show a consistent protective effect of breastfeeding against breast cancer.<sup>3,20,21</sup>
  - 2. A dose effect of breastfeeding impacts the reduction risk for breast cancer. For every 12 months of cumulative breastfeeding, the risk is reduced by 4.3 percent.<sup>20</sup>
- B. Breastfeeding lowers the risk for the incidence of developing ovarian cancer.
  - 1. Multiple systematic reviews and meta-analyses show a consistent protective effect of breastfeeding against ovarian cancer.<sup>3,20,22-24</sup>
  - 2. A longer duration of breastfeeding results in a greater protective benefit. Women who breastfed for 6 months or less had a 17 percent risk reduction, compared to women who breastfed for 6 to 12 months, who had a 28 percent risk reduction.<sup>20</sup>

- C. Breastfeeding is associated with lactational amenorrhea, or a delay in the return of menses after birth. Exclusive breastfeeding for 6 months or longer is associated with lactational amenorrhea and increased spacing of pregnancies.<sup>20,25,26</sup>
- D. Breastfeeding may be associated with a reduced risk of developing Type 2 diabetes. A meta-analysis of six cohort studies demonstrated a 9 percent protection against maternal Type 2 diabetes for a 1-year increase in the total lifetime duration of breastfeeding.<sup>27</sup>
- E. Breastfeeding may be associated with a reduced risk of developing cardiovascular disease.
  - 1. Although no systematic reviews or meta-analyses have been published, two good-quality cohort studies have demonstrated an association between breastfeeding and a reduced risk for maternal cardiovascular disease.<sup>28,29</sup>
  - 2. Women who breastfed longer than 12 months in their lifetimes had less incidence of hypertension, diabetes, hyperlipidemia, or cardiovascular disease.<sup>28</sup>
  - 3. In women aged 50 years or younger, never breastfeeding was associated with a higher risk for hypertension, diabetes, and obesity.<sup>29</sup>

### III. Global Economic Impact of Breastfeeding

- A. UNICEF conducted an economic analysis of the impact of increased breastfeeding on four acute pediatric illnesses and maternal breast cancer in the United Kingdom.
  - 1. The analysis was based on a moderate increase in breastfeeding, including 45 percent of women who were exclusively breastfeeding for 4 months and 75 percent of breastfeeding babies who were discharged from neonatal units. The resulting economic impact would be as follows:
    - a. A total of 3,285 fewer gastrointestinal infection related hospital admissions, resulting in £3.6 million (\$5 million) saved in treatment costs annually.
    - b. A total of 5,916 fewer lower respiratory tract infection related hospital admissions, resulting in £6.7 million (\$9.3 million) saved in treatment costs annually.
    - c. A total of 21,045 fewer cases of AOM healthcare provider visits, resulting in £750,000 (\$1 million) saved in treatment costs annually.
    - d. A total of 361 fewer cases of NEC, resulting in more than £6 million (\$8.3 million) saved in treatment costs annually.<sup>30</sup>
  - 2. A second analysis was conducted based on a 50 percent increase in women who choose to breastfeed for up to 18 total months in their lifetimes. The resulting economic impact on the reduced incidence of breast cancer would be 865 fewer breast cancer cases, resulting in more than £21 million (\$29.1 million) saved in treatment costs annually.<sup>30</sup>
- B. A cost analysis of suboptimal breastfeeding rates in the United States reported 3,340 additional deaths attributed to suboptimal breastfeeding.<sup>31</sup>
  - 1. A total of 78 percent were maternal and due to myocardial infarction, breast cancer, and diabetes.
  - 2. A total of 22 percent were pediatric deaths, mostly attributed to SIDS and NEC.
  - 3. The total cost of premature death totaled \$14.2 billion (£10.3 billion).
- C. Another cost analysis of suboptimal breastfeeding rates in the United States, with a subanalysis to examine racial disparities, reported a higher incidence of disease in the non-Hispanic black (NHB) population and the Hispanic populations in the United States.<sup>31</sup>
  - 1. The NHB population had 1.7 times the number of excess cases of AOM, 3.3 times the number of excess cases of NEC, and 2.2 times the number of excess child deaths, compared to the non-Hispanic white (NHW) population.
  - 2. The Hispanic population had 1.4 times the number of gastrointestinal infections and 1.5 times the number of excess child deaths as the NHW population.
- D. A cost analysis of suboptimal breastfeeding in Southeast Asia was based on increased breastfeeding rates to 100 percent of children exclusively breastfed to age 6 months, with continuation of some breastfeeding to age 2 years.<sup>32</sup>
  - 1. Developmental cognitive losses were extrapolated to lost earnings income of \$1.6 billion (£1.16 billion) annually.
  - 2. Health expenditures increased \$293.5 million (£212 million) annually.

3. A total of 1,706 maternal deaths could be averted annually with optimal breastfeeding rates.
  4. A total of 3,189 cases of gastrointestinal infections are attributable to suboptimal breastfeeding rates in Southeast Asia.
  5. A total of 7,528 cases of acute respiratory illness are attributable to suboptimal breastfeeding rates in Southeast Asia.
- E. An estimated 823,000 lives could be saved annually in low- and middle-income countries worldwide if breastfeeding practices were optimal.<sup>33</sup>

## ► Key Points from This Chapter

- A. Clear and consistent messaging from lactation support providers to parents about the benefits of breastfeeding will help parents make informed decisions.
- B. The benefits of breastfeeding for infants, supported by systematic reviews and meta-analyses, include excellent evidence for decreased risk of respiratory infection, gastrointestinal infection, SIDS, AOM, NEC, dental caries, malocclusion, and leukemia.
- C. There is moderate evidence for decreased risk of asthma, obesity, diabetes, and higher intelligence. More research is necessary.
- D. The benefits of breastfeeding for parents, supported by systematic reviews and meta-analyses, include excellent evidence for decreased risk of breast cancer, ovarian cancer, and lactational amenorrhea.
- E. There is moderate evidence for decreased risk of Type 2 diabetes and cardiovascular disease. More research is necessary.
- F. The economic impact of suboptimal breastfeeding is significant worldwide.
- G. Increasing breastfeeding to optimal levels, as defined by the World Health Organization, would have a significant impact on lives and healthcare dollars saved.<sup>1</sup>

## CASE STUDY

You are a lactation consultant who is teaching a prenatal breastfeeding class to a group of diverse new parents and families. You ask the class participants to share what they have heard about breastfeeding from the media, friends, family, and healthcare providers. One participant states that she has read that breastfed infants have fewer ear infections, but her nephew was breastfed and had multiple ear infections. Another class participant says she heard that breastfeeding decreases a woman's chance of being diagnosed with breast cancer, but her mother breastfed four children and was recently diagnosed with breast cancer. A male participant says he was formula fed as an infant and he "turned out okay." He questions whether breastfeeding has any real impact on health.

### Questions

1. How would you respectfully acknowledge the class participants' experiences that are not reflective of current research?
2. How would you use current research to address the class participant's comments about breastfeeding and the incidence of ear infections?
3. How would you use current research to address the class participant's comments about breastfeeding and the incidence of breast cancer?
4. How would you use current research to describe the overall health benefits of breastfeeding?

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