



## Systematic Review

# Early Breastfeeding Initiation Effect in Stunting: A Systematic Review

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### ABSTRACT

**Introduction:** Stunting has been a global burden worldwide, resulting in severe outcomes, including inadequate brain development until mortality. Early breastfeeding initiation as a global strategy affects the success of continuous breastfeeding that influences the children's growth and development. This study aimed to provide a literature review on how early breastfeeding initiation might help children avoid stunting.

**Methods:** We searched articles published from 2017 to 2022 in PubMed, Science Direct, Cochrane, and the Indonesia Database with keywords "Early breastfeeding initiation" OR "Early breastfeeding" OR "Early Initiation Breastfeeding" AND "stunting." All data were gathered and analyzed.

**Results:** A total of 12 articles from 6690 articles met the inclusion, exclusion, and eligibility criteria. The mean of early breastfeeding initiation was 61,82%, with the lowest study in Chimborazo and Tungurahua, Ecuador, and stunting was 33,07% as the highest prevalence was in Chimborazo and Tungurahua, Ecuador, while the lowest in Saharawi refugee camps, Algeria. The mean prevalence of children who did not get early breastfeeding initiation and stunting occurred at 40,85%, and eight studies reported that early breastfeeding initiation was associated with stunting.

**Conclusion:** Early breastfeeding initiation can lower stunting risk in children. Early breastfeeding initiation ensures children obtain enough colostrum that enhances the children's immunity and probability of exclusive breastfeeding, ensuring children obtain adequate nutritional intake and prevent stunting.

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## INTRODUCTION

Stunting is defined as a condition of growth failure in children below five years due to chronic malnutrition resulting in children's growth not being as high as children in his age [1]. In Indonesia, childhood stunting is a severe public health issue [2]. According to statistics from the 2019 Indonesia's Basic Health Research Survey, the prevalence of stunting in children below five years is now reasonably high, at 30.8 percent [3]. Early childhood stunting has multiple severe outcomes, including mortality, illness, disability, and inadequate brain development, which has long-term consequences for cognitive capacity, reproductive ability, metabolic and blood vessel disease, and future earnings as an adult [2, 4].

Global strategy on feeding infants and young children by WHO and UNICEF recommends early breastfeeding initiation within 1 hour of birth, breastfeeding exclusively for the first six months of infancy, and giving complimentary food accompanied by breastfeeding beginning from six months old while continuing breastfeeding until two years of age or more [5]. Early breastfeeding initiation become the main gateway for future successes breastfeeding and ensures that children obtain adequate nutrition so that early breastfeeding initiation can lower the risk of stunting [4]. The objective of this paper was to conduct a literature review on how early breastfeeding initiation might help children avoid stunting.

## MATERIAL AND METHODS

### Literature Search

We searched articles published between 2017 to 2022 in PubMed, Science Direct, Cochrane, and the Indonesia Database with keywords “Early initiation of breastfeeding” OR “Early breastfeeding” OR “Early breastfeeding initiation” AND “stunting.” Before reviewing the abstracts and full-text of chosen studies, two writers independently assessed the article titles to identify papers that did not match our inclusion criteria. Our search approach adhered to the Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P). This review was not registered.

### Eligibility Criteria

Research studies were chosen for review that met these specific criteria: (i) experimental, observational, and qualitative updated with newest research published from 2017 to 2022 (ii) utilized an outcome that measured stunting (iii) children aged 0–60 months (iv) research done on women who report prompt breastfeeding initiation (v) were published in English.

Studies with poor quality, abstract reviews, systematic review papers, conference abstracts, case reports, opinions, news articles, and literature presenting exclusively epidemiological findings were excluded. Studies on children with congenital abnormalities or intellectual impairments that interfere with feeding, as well as studies that do not include measurements of height, length, and weight, were omitted.

### Definition

WHO 2000 growth chart standard was used to define short (stunted) and very short (severely stunted) children in children under five years old using comparison of body length or height according to their age. Height-for-age z score (HAZ)/ length-for-age z score  $< -2SD$ /standard deviation was defined as stunted and less than  $-3SD$  was defined as severely stunted [1, 3]. Early breastfeeding initiation was defined as starting breastfeeding or placing infants on the mother's chest to feed milk within one hour after childbirth [6].

### Data Extraction

Data were extracted from the articles and compiled into tables in standardized Microsoft Excel spreadsheet prepared format. Initially, two reviewers (SCS and NRS) selected papers from titles and abstracts that were relevant and suitable. The two reviewers independently assessed the quality of the retrieved full text and the article's eligibility. Two reviewers (NRS, M) separately extracted and analyzed the following from first author's name, publication year, study design, geographical setting, sample size, the prevalence of early breastfeeding initiation, and stunting.

### Statistical Analysis

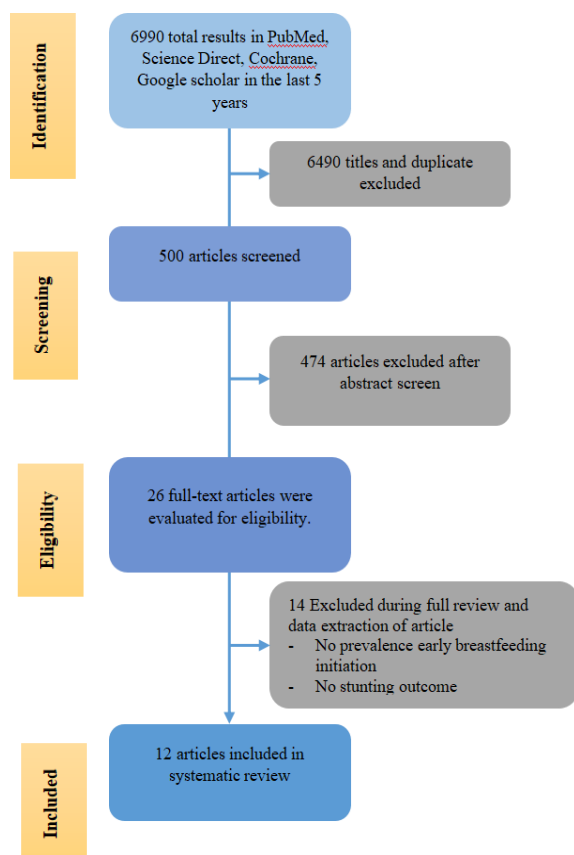
All essential data were gathered and documented, means and percentages were used to report numerical data variables. We utilized SPSS 20.0 for Windows for statistical analysis.

## RESULT

A total of 6990 articles were retrieved from the four databases. After screening the title and removing duplicates, 500 articles were retained. A screening of the abstract resulted in the exclusion of 474 articles. The full-text of the remaining 26 articles was reviewed and 14 were further excluded. Twelve articles met the inclusion criteria, as shown in Figure 1.

### Study Characteristic

The studies were conducted in a wide range of countries spanning three continents, i.e., Indonesia 4 studies, India 2 studies, each of 1 study from Algeria, Congo, Rwanda, Ethiopia, Ecuador, and Tanzania. Sample sizes ranged from 94 to 140,444 participants. Subject ages ranged from 0-59 months. Those studies were conducted in August 2004-December 2019 (Table 1).



**Figure 1.** Flow Diagram of Systematic Reviews and Meta-Analyses (PRISMA) in Searching Articles

**Table 1. Characteristics of the studies**

First Authors Name	Publication Year	Study Conducted	Geographical Setting	Study Design	Sample Size
Aakre, Inger [10]	2017	October-December 2010	Saharawi refugee camps, Algeria	Cross-sectional	111 women with children 0–6 months of age
Ayalign, Abebe [7]	2021	January-June 2016	Ethiopia	Cross-sectional	11.023 children aged 0–59 months
Dahliansyah, Dahliansyah [11]	2020	May 2019	Kelantan Siantan, Pontianak City, Indonesia	Cross-sectional	94 children aged 6-59 months
Kim, Rockli [12]	2019	2015-2016	India	Cross-sectional	140.444 children aged 6-59 months
Kismul, Hallgeir [9]	2018	2013-2014	Congo	Cross-sectional	9.030 children below the age of 5 years
Muldiasman, Muldiasman [4]	2018	2015	Jambi Province, Indonesia	Cross-sectional	1.814 children aged 6-59 months
Nsereko, Etienne [15]	2018	2010	Rwanda	Cross-sectional	1.634 children were $\leq 2$ years of age.
Roche, Marion L [8]	2017	March-April 2009	Chimborazo and Tungurahua, Ecuador	Cross-sectional	293 infants and children between 0 and 24 months of age
Satapathy, Durga Madhab [16]	2021	January-December 2019	Ganjam District, Odisha, India	Cross-sectional	360 children of 6–23 months
Sentana, Lyana Firsta [13]	2018	September 2016 – July 2017	Sukajadi, Pekanbaru City, Indonesia	Cross-sectional	199 children aged 12-24 months
Simanjuntak, Betty Yosephin [14]	2018	May-September 2015	10 districts in Bengkulu Province, Indonesia	Cross-sectional	1.592 toddlers aged 6-59 months
Smith, Emily R. [17]	2017	August 2004-2009	Dar es Salaam City, Tanzania	Prospective cohort	4.203 infants

### Prevalence of Early breastfeeding initiation

Twelve studies showed mean early breastfeeding initiation was 61,82% (Table 2). The highest of early breastfeeding initiation was seen in Ethiopia (84,90%) [7], and the lowest in Chimborazo and Tungurahua, Ecuador (41,30%) [8], followed by study in Congo, Africa (44,4%) [9].

### Prevalence Stunting

The mean prevalence of stunting of the 12 studies reviewed, was 33,07% (Table 2). The highest prevalence is in Chimborazo and Tungurahua, Ecuador (56%) [8], and the lowest prevalence in Saharawi refugee camps, Algeria (13,80%) [10].

### The relationship between stunting and early breastfeeding initiation

The mean prevalence of children who received early breastfeeding initiation and stunting was 27,20%, whereas children who did not get early breastfeeding initiation and stunting occurred at 40,85%. Eight studies reported that early breastfeeding initiation associated with stunting [4, 7–9, 11–14], and 4 studies are not associated with stunting [10, 15–17].

## DISCUSSIONS

Stunting was more prevalent in children over the age of two than in children under the age of two, because, at this age, children begin to be weaned and are exposed to hazardous environmental factors outside the house, as well as may not be receiving appropriate nutrition [18]. Eight studies elucidated that early breastfeeding initiation reduces the risk of stunting. Stunting occurs more frequently in children who do not begin early breastfeeding initiation. Subsequently, early breastfeeding initiation should begin no later than one hour of delivery to protect infants from infection and minimize neonatal mortality [9, 18]. Early breastfeeding initiation occurs naturally, while the infants are put straight in the mother's chest after delivery to begin feeding while initial searching for mother's nipple during the first hour after birth [4].

The advantages of early breastfeeding initiation may decrease the risk of newborn morbidity and mortality. It may have reduced mortality rate because mothers who breastfeed their newborns soon after birth have a better likelihood of successfully breastfeeding [14]. Pre-lacteal feeding of non-human milk antigens may interfere with normal physiologic gut priming and increase the chance of partial breastfeeding during the first 6 months, which has been linked to stunting [9, 14]. Total protein and immunoglobulin levels also decrease dramatically during the first few days of birth and it would necessary to do early breastfeeding initiation. Early human milk

**Table 2. Prevalence Early Breastfeeding Initiation and Stunting**

First Author	Prevalence Early breastfeeding initiation (EIB)			Not Performed EIB			Odd Ratio, CI 95%, and p-value	Adjusted Odd Ratio, CI 95%, and p-Value	Results
	Total EIB Prevalence	Prevalence Stunting	Normal Growth	Total Stunting Prevalence	Stunting Prevalence	Normal Growth			
Aakre, Inger [10]	64,90%	NA	NA	13,80%	NA	NA	NA		Early breastfeeding initiation did not seem to be associated with stunting
Ayelnig, Abebe [7]	84,90%	NA	NA	38%	NA	NA		1.56, CI95%: 1.14 to 2.14, p<0.05	Children who had delayed (by 1 h) initiation of breast feeding had a 1,56 more risk of stunting than those who had immediately breastfeeding after birth.
Dahliansyah, Dahliansyah [11]	68,10%	21,90%	79,10%	30,90%	50,00%	50,00%	0.323, CI95%: 0.124 to 0.842, p<0.05		Toddlers who get EIB at birth have a 0.3 times chance of not experiencing stunting compared to those who do not get EIB
Kim, Rockli [12]	55,50%	37,75%	62,25%	38,62%	39,70%	60,30%	1.05, CI95%: 1.01 to 1.09, p<0.05		Delayed breastfeeding initiation were significantly associated with higher odds of stunting.
Kismul, Hallgeir [9]	44,40%	41,20%	58,80%	42,70%	43,60%	56,40%		0.82, CI95%: 0.70 to 0.95, p<0.05	Early breastfeeding initiation had lower odds of stunting.
Muldiasman, Muldiasman [4]	45,90%	23,30%	76,70%	27,50%	31,10%	68,90%		1.3, CI95%: 1.0 to 1.6, p<0.05	Delayed initiation to breastfeeding is a significant factor in stunting amongst 6–59-month-old children.
Nsereko, Etienne [15]	69,77%	32,90%	67,10%	35,07%	37,60%	62,40%	1.16, CI95% = 0.90 to 1.51, p>0.05		Early initiation to breastfeeding were not associated with childhood stunting
Roche, Marion L [8]	41,30%	NA	NA	56%	NA	NA	0.58, CI95%: 0.33 to 0.99, p<0.05		Early breastfeeding initiation protective from stunting
Satapathy, Durga Madhab [16]	62,20%	NA	NA	31,10%	NA	NA	NA		Exclusive breastfeeding was the primary node to determine the stunting, EIB is not stunting factor
Sentana, Lyana Firsta [13]	72,20%	11,46%	88,54%	22,60%	51,35%	48,65%	8.157, p<0.05		Children who do not undergo EIB will be at risk of experiencing stunting 8.157 times compared to children who do EIB
Simanjuntak, Betty Yosephin [14]	45,40%	21,90%	78,10%	26,80%	32,60%	67,40%	1.738, CI95%: 1.390 to 2.174, p<0.05		Toddlers who did not get early breastfeeding initiation are at risk of 1.738 times stunting compared to toddlers who got early breastfeeding initiation
Smith, Emily R. [17]	87,28%	NA	NA	33,71%	NA	NA	0.93, CI95%: 0.79 to 1.1, p>0.05		Delayed breastfeeding initiation not related to stunting, but is associated with an increased risk of infant morbidity during the first 6 months of life.
<b>MEAN</b>	61,82%	27,20%	72,94%	33,07%	40,85%	59,15%			

contains several immunological and non-immune components that may enhance intestinal maturation, infection resistance, and epithelial recovery after infection [14]. Early breastfeeding initiation is convenient with administering in a short period time; however, it has a long-term impact on the baby. This advantage can be developed if the mother is aware of the benefits and procedure of early breastfeeding initiation

[4]. Encouraging warmth and protection during breastfeeding initiation may lower the risk of hypothermia-related mortality on day one, particularly in preterm newborns [14].

Breast milk is the finest nourishment for newborns from birth to 6 months of age. Breast milk contains substance and nutrients that are needed for newborns [18]. Breastfeeding for one hour after birth will provide

the newborn with nutrition and antibodies that the infant needs, abundant in colostrum [14], rich in protective factors and boost the child's immunity against illness [7,9,19]. Furthermore, early breastfeeding initiation has become the main pathways to subsequent effective breastfeeding and ensures that children obtain sufficient nutritional intake, lowering the chance of stunting [7,20].

Four reviewed studies elucidated that early breastfeeding initiation was not related with the prevalence of stunting. However, their study showed that early initiation breastfeeding associated with other factors that influenced stunting, particularly infant morbidity and mortality [10,15–17]. Stunting, it should be emphasized, defines as a symptom from chronic malnutrition and appears more frequent later in infancy. As a result, the consequences of poor feeding habits on stunting will not be seen during the infancy's first few months of life [10]. A study by Satapathy et al. [16] reported that exclusive breastfeeding was the critical node that determined to stunting; however early breastfeeding initiation is not a stunting factor. Early breastfeeding initiation increases the chance of exclusive breastfeeding [10]. Subsequently, it can be assumed that early breastfeeding initiation will increase the chance of exclusive breastfeeding, resulting in the prevention of stunting.

According to Smith et al. [17], delayed breastfeeding initiation is not related to stunting. However, it is associated with a higher risk of infant mortality and mortality within the first six months of age. Stunting was more common in children who had a history of infectious illnesses [18]. Malnutrition is linked to a weakened immune system, and children were found to be chronically malnutrition due to insufficient food intake and recurring illnesses in the digestive tract [18,21].

Stunting is influenced by a various factor such as household, nutritional, and healthcare variables, both at the individual and community levels. Similarly, increasing family income, women's empowerment, nutritional variety among mothers and children, and enhancing maternal health care systems are crucial to reducing under-five stunting more rapidly [7]. Optimal breastfeeding practices should be promoted to establish improved child feeding habits and avoid childhood malnutrition [10]. This study has several limitations, namely the diversity of the geographic environment of all the studies used and the many confounding factors that could influence these results.

## CONCLUSION

Early breastfeeding initiation can lower the risk of stunting. Early breastfeeding initiation assures that the baby receives colostrum, which enhances the child's

immunity and possibility of exclusive breastfeeding, ensuring children obtain adequate nutritional intake, which can prevent stunting. Early breastfeeding initiation is inexpensive and even seems to have a beneficial health impact on the children. Efforts should be taken before the baby is born to educate the mother and her family about early breastfeeding initiation.

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## CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

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