

# Can early initiation to breastfeeding prevent stunting in 6–59 months old children?

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## Abstract

**Purpose** – The prevalence of stunting in children under five years old is high (37.9 percent). The health advantage of breast milk as a prevention is recognized. The purpose of this paper is to examine the relationship of early initiation to breastfeeding, wherein a child is breastfed within an hour of birth, as a means of preventing stunted growth in 6–59 month old children in Jambi province, Indonesia.

**Design/methodology/approach** – This paper used data from the 2015 National Nutrition Survey in Jambi province. A total of 2,502 children aged 6–59 months were analyzed by binary logistic regression.

**Findings** – The results showed that as many as 27.5 percent (95% CI: 25.2–29.9) children aged 6–59 months were stunted and 54.1 percent (95% CI: 51.1–57.1) had not been introduced to breastfeeding soon after birth. The analysis showed that delayed initiation to breastfeeding is a significant factor in stunting amongst 6–59 month old children. ( $p = 0.024$ ; AOR = 1.3; 95% CI: 1.0–1.6). Other results of the analysis showed a significant association between water source and birth weight issues as causes for stunting.

**Originality/value** – Research revealed that delayed initiation into breastfeeding results in a 1.3 times higher risk of stunting. Furthermore, early initiation to breastfeeding reduces the risk of consuming polluted river water that is a health risk and cause of stunting.

**Keywords** Indonesia, Breastfeeding, Early initiation to breastfeeding, Stunting in children

**Paper type** Research paper

## Introduction

The purpose of this study was to determine the relationship between early initiation to breastfeeding with stunting in children 6–59 months. Stunting in children under five years is a global problem, mainly experienced in developing countries. The results of a joint UNICEF, World Health Organization (WHO) and World Bank analysis of 142 national survey results of poor and developing countries, found that in 2011, stunting prevalence affected 165 million children with an estimated 127 million children under five projected to be stunted by 2025[1, 2]. Stunting in under-five children is a problem in Indonesia where basic health research (Risksedas) revealed the high prevalence of stunting in under fives in 2007, 2010 and 2013 by 36.8, 35.6 and 37.2 percent[3–5]. Jambi Province has a stunting problem greater than the national average by 37.9 percent[5].

Stunting creates a barrier to the forming and development of organs and has a short term impact on mortality, morbidity and disability. Long term consequences include negative

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impacts on adult body size, intellectual ability, economic productivity, reproductive ability and metabolic and blood vessel disease[1, 6, 7].

Diarrhea, cough, cold, fever, shortness of breath, are associated with stunting in children under five[8] and is a proven risk of respiratory tract infection by four times[9]. The risk of stunting increases based on an unhealthy source of drinking water[10] and poor sanitation facilities[11, 12]. Low participation in basic community health checks is another risk factor of stunting in urban areas[13].

Early initiation to breastfeeding, exclusive breastfeeding, duration of breastfeeding, and vitamin A administration are associated with preventing stunting in children under five years of age. Previous research indicates an exclusive breastfeeding relationship with stunting[14, 15] and a relationship between supplementation to breast feeding during the first four months ( $p = 0.04$ ) with stunting in children[16].

## Methods

Data from the National Nutrition Survey in Jambi province in 2015 were studied. Data were collected through Nutrition Status Monitoring Activities using a cross-sectional design including questionnaires, interviews and observations. The status of exposure and disease were observed simultaneously in individuals over the same period between September and October 2015.

The research location was Jambi Province, Indonesia consisting of ten districts/cities. In total, 30 clusters were selected from each district and city. In each cluster ten households were selected as the sample.

The population of this study was all children aged 6–59 months in Jambi province. The sample criteria included the following: child's birth date is known, the child is weighed at birth and during observation, the child's length is measured at birth and during observation, the determinant of stunting questionnaire in the child is complete.

The selection of clusters in districts and cities is systematically randomized based on probability proportional to size. The nutritional status used was collected by looking at birth records, viewing MCH books, interviews with toddlers and field observations. Stunting is measured anthropometrically according to WHO standards 2005.

Data collection was conducted by graduates of the Nursing and Midwifery Academy. There were six people in each District/City and two field supervisors. The Data collector and supervisor team attended three days training on September 18–20, 2015. Training materials comprised: nutrition program policies, sampling methods, interview techniques, anthropometric measurements, questionnaire content and field practice.

Univariate analysis was performed to provide a stunting prevalence picture in children 6–59 months, early initiation to breastfeeding and other variables. The bivariate analysis was conducted to find out the association of each independent variable with stunting variable in children 6–59 months. Multivariate analysis was conducted to see the relationship of early initiation to breastfeeding with stunting in children 6–59 months. Analysis was done by binary logistic regression for survey data.

## Results

### *Stunting in children 6–59 months*

A total of 27.5 percent (95% CI: 25.2–29.9) children aged 6–59 months are stunted in Jambi province, Indonesia, in 2015.

### *Early initiation to breastfeeding and child characteristics 6–59 months*

Most children of 6–59 months do not get the opportunity to breastfeed early (54.1 percent; 95% CI: 51.1–57.1) with irregular visits to community base health services/*posyandu* (44 percent). The number of boys (52 percent) is almost the same as girls (48 percent).

A small number of them do not have good sanitation facilities (14 percent). Some of them are not exclusively breastfed (41 percent). A small number of them have a history of diarrhea in the last one month (15 percent). Over a third of them had a history of cough (38 percent), cold (45 percent), fever (35 percent) in the last one month. A small number of them do not boil drinking water (13 percent). Most of them live in rural areas (74 percent). Father and mother ethnicity is predominantly, non native or “The Outsider” (41 percent) and Mixed (12 percent). Some of them have well water as a source of drinking water (57 percent). A few (3 percent) of their families have an inadequate quality source of drinking water (cloudy/smelly/tasty/colorful). A small number of them have poorly structured homes (3 percent). A small number of them have a large number of household members (18 percent). Fathers education (53 percent) and mothers education (55 percent) are basic. A minority of fathers jobs are “not fixed and others” (15 percent) while a small portion of mothers (21 percent) are working. Few of them weigh less than 2,500 gram (3 percent). More than a quarter of them had a birth length of less than 48 cm (27 percent) (Table I).

Other results of the analysis showed a significant association between water source and birth weights to stunting (Table II). The most dominant risk factor for stunting was age 24–59 months with a risk 2.5 times higher than the age of 6–11 months ( $p = 0.000$ ; AOR = 2.5; 95% CI: 1.8–3.6).

## Discussion

### *Stunting in children 6–59 months*

Based on the research results, it is known that 27.5 percent (95% CI: 25.2–29.9) of children aged 6–59 months were stunted in Jambi province in 2015. This is lower than 2007 (36.4 percent), 2010 (30.2 percent), 2013 (37.9 percent) but still remains a serious problem that needs further treatment. If the trend of stunting problems continues, an estimated 127 million toddlers will be stunted by 2025[1, 2].

In 2012, through the World Health Assembly Resolution 65.6, a comprehensive effort on the nutritional condition of mothers, infants and children, known as the “six global nutrition targets for 2025” was recommended. This policy concerns the first target of a 40 percent reduction in the number of children under-five who are stunted[2]. Nutritional interventions alone (specific programs) are not sufficient to achieve optimal child development and nutrition, as it is important to strengthen sensitive nutrition development efforts and improve them with evidence-based, nationwide multi-sectoral plans aimed at stunting, combining nutritional interventions with health, family planning, water and sanitation strategies and other factors that influence the stunting risk (sensitive programs). It takes a measurable work plan to develop and oversee the implementation of commitments and targets[1, 17].

### *Early initiation to breastfeeding and stunting*

This study shows that children who do not get an early initiation to breastfeeding are 1.3 times more likely to be stunted than those who are breastfed early. These results illustrate early initiation to breastfeeding as a form of maternal care and the best giving of nutrients early in life that can reduce the risk of stunting. Early breastfeeding initiation is one of the entrances to successful breastfeeding at a later time and ensures children receive appropriate nutritional intake[2, 7].

Similar results are proven in previous studies. Initiation of breastfeeding after six hours of birth or discarding colostrum due to ignorance of its health benefits as well as breastfeeding supplementation is a risk factor for stunting children under five[18]. This study shows that one of the efforts to overcome stunted problems in children is to provide early initiation to breastfeeding. Early initiation to breastfeeding takes place naturally, where the child after birth is directly placed in the mother’s chest to initiate the search for the mother’s nipple to feed within the first hour of birth. Early initiation to breastfeeding is

Variables	Children 6–59 months				Crude OR	95% CI	p-value
	Normal n	%	Stunting n	%			
<i>Early initiation to breastfeeding</i>							
Yes	881	76.7	267	23.3	1	Ref	
No	933	68.9	421	31.1	1.5	1.2	1.8
<i>Visiting community base health service</i>							
Good (≥ 4 times in 6 month)	1,105	74.2	385	25.8	1	Ref	
Not good (< 4 times in 6 month)	709	70.1	303	29.9	1.2	1.0	1.5
<i>Birth weight</i>							
Normal (≥ 2,500 gram)	1,764	73.0	653	27.0	1	Ref	
Low birth weight (< 2,500 gram)	50	58.8	35	41.2	1.9	1.1	3.2
<i>Length at birth</i>							
Normal (≥ 48 cm)	1,350	73.7	482	24.1	1	Ref	
Less (< 48 cm)	465	69.4	205	29.5	1.2	0.9	1.5
<i>Exclusive breastfeeding</i>							
Yes	1,088	73.9	385	26.1	1	Ref	
No	727	70.6	302	29.4	1.2	0.9	1.4
<i>Diarrhea history in the last 1 month</i>							
No	1,566	73.6	563	26.4	1	Ref	
Yes	248	66.6	125	33.4	1.4	1.1	1.7
<i>Cough history in previous month</i>							
No	1,128	72.9	419	27.1	1	Ref	
Yes	686	71.8	269	28.2	1.1	0.9	1.3
<i>Cold history in previous month</i>							
No	998	73.0	368	27.0	1	Ref	
Yes	817	71.9	319	24.9	1.1	0.9	1.3
<i>Fever history in previous month</i>							
No	1,187	73.4	430	26.6	1	Ref	
Yes	628	70.9	257	29.1	1.1	0.9	1.4
<i>Shortness of breath history in previous month</i>							
No	1,758	72.5	668	27.5	1	Ref	
Yes	56	73.8	20	26.2	0.9	0.6	1.5
<i>Boiling drinking water</i>							
Yes	1,565	71.9	612	28.1	1	Ref	
No	250	76.7	75	23.3	0.7	0.5	1.1
<i>House structure</i>							
Good	1,766	72.9	657	27.1	1	Ref	
Not good	48	61.0	31	39.0	1.7	1.1	2.6
<i>Sanitation facilities</i>							
Yes	1,587	73.7	565	26.3	1	Ref	
No	227	64.9	123	35.1	1.5	1.1	2.0
<i>Water sources</i>							
Pipe	362	71.4	144	28.6	1	Ref	
Well	1,031	72.3	395	27.7	0.9	0.7	1.2
River	26	45.3	31	54.7	3.0	1.5	5.9
Rainwater collection	113	83.2	23	16.8	0.5	0.3	0.9
Gallon refill	283	75.1	94	24.9	0.8	0.6	1.2

(continued)

**Table I.**  
Bivariate analysis  
early initiation to  
breastfeeding relations  
and other  
determinants with  
stunting in children  
6–59 months

Variables	Children 6–59 months				Crude OR	95% CI	p-value
	Normal n	%	Stunting n	%			
<i>Quality of water source</i>							
Good	1,775	72.7	665	27.3	1	Ref	
Not good	39	63.5	23	36.5	1.5	0.9	2.6 0.109*
<i>Number of household members</i>							
Small (≤ 4 persons)	1,494	73.0	552	27.0	1	Ref	
Big (> 4 persons)	321	70.4	135	29.6	1.1	0.9	1.4 0.294
<i>Region type</i>							
Urban	497	77.4	145	22.6	1	Ref	
Rural	1,318	70.8	542	29.2	1.4	1.1	1.8 0.011**
<i>Father and mother ethnicity</i>							
Origin	796	66.7	397	33.3	1	Ref	
Mixed ethnic	230	79.4	60	20.6	0.5	0.4	0.7 0.000**
Outsider ethnic	788	77.3	231	22.7	0.6	0.5	0.7 0.000**
<i>Fathers education</i>							
Medium (high school or above)	878	74.3	303	25.7	1	Ref	
Basic (Junior high school or not)	937	70.9	384	29.1	1.2	0.9	1.4 0.087*
<i>Mothers education</i>							
Medium (high school or above)	849	75.1	282	24.9	1	Ref	
Basic (Junior high school or not)	965	70.4	406	29.6	1.3	1.0	1.6 0.023**
<i>Father's occupation</i>							
Fixed work	1,534	72.2	589	27.8	1	Ref	
Labor and others	281	74.0	98	26.0	0.9	0.7	1.2 0.517
<i>Mothers occupation</i>							
Housewife	1,445	73.0	535	27.0	1	Ref	
Career	369	70.7	153	29.3	1.1	0.9	1.4 0.357
<i>Age (months)</i>							
6–11	356	84.7	64	15.3	1	Ref	
12–23	580	74.1	203	25.9	1.9	1.4	2.6 0.000**
24–59	878	67.6	421	32.4	2.6	1.9	3.7 0.000**
<i>Sex</i>							
Boys	928	71.4	373	28.6	1	Ref	
Girls	886	73.8	315	26.2	0.9	0.7	1.1 0.188*

**Table I.** Notes: n = 2,502. Ref, reference. \*p < 0.25; \*\*p < 0.05

easy, takes a short time and has a long-term effect on the child. This opportunity can be accomplished if the mother of the newborn is aware of the benefit and process of early breastfeeding. Promotion efforts to educate the mother and family should be carried out before birth.

Other results of the analysis showed a significant association between age, water source and birth weights to stunting in 6–59 months of children. These results indicate that stunting is caused by many factors.

Early initiation to breastfeeding ensures that the baby gets colostrum that increases the child's immunity to infection and furthermore, exclusive breastfeeding will keep children away from contaminated water sources for at least the first 6 months. Adequate foods and no infection make the child grow optimally[19–22] and reduces the risk of stunting.

**Table II.** Multivariate analysis early initiation to breastfeeding with stunting in children 6-59 months

No.	Variables	<i>B</i>	<i>p</i> -value	Adjusted OR	95% CI	
1	No early initiation to breastfeeding	0.241	0.024	1.3	1.0	1.6
2	Birth weight (< 2,500 gms)	0.695	0.011	2.0	1.2	3.4
3	Diarrhoea	0.317	0.016	1.4	1.1	1.8
4	House structure (not good)	0.456	0.047	1.6	1.0	2.5
5	Water sources					
	Pipe			1	Ref	
	Well	-0.018	0.895	1.0	0.7	1.3
	River	0.759	0.032	2.1	1.1	4.3
	Rainwater collection	-0.527	0.102	0.6	0.3	1.1
	Gallon refill	-0.067	0.710	0.9	0.6	1.3
6	Region type (rural)	0.301	0.031	1.4	1.0	1.8
7	Father and mother ethnicity					
	Origin			1	Ref	
	Mixed ethnic	-0.522	0.004	0.6	0.4	0.8
	Outsider ethnic	-0.385	0.001	0.7	0.5	0.9
8	Age (months)					
	6-11			1	Ref	
	12-23	0.604	0.000	1.8	1.3	2.6
	24-59	0.936	0.000	2.5	1.8	3.6
	Intercept	-1.901				

**Note:** Ref, reference

The difference in risk of stunting based on drinking water sources was also revealed by several other researchers[10, 23].

The results of this study indicate that there are differences in the growth of children by age. Growth disorders will accumulate with age[24-27]. Differences in the growth of children by age are also found elsewhere. For two years the age of the child was 9 cm in contrast to the WHO standard in Malawi, then only increased by 1 cm by age 2-3 years from 10 cm difference. Differences of two centimeters (20 percent) occur at birth, 4 cm (40 percent) occur from birth to 12 months of age, and 3 cm (30 percent) occur from 12-24 months. Early cause is a combination of growth disorders in the uterus, inadequate nutrition after birth, marked by low exclusive breastfeeding (28 percent) and low nutritional intake of breast milk due to malnourished mother, and infection after birth[27].

## Conclusion

Early initiation to breastfeeding can be associated with preventing stunting in 6-59 month of children after adjusted to all others variables. There is also a significant association between water source and birth weight to stunting. Children with a low birth weight are 2.0 times at higher risk of stunting than normal-born. The most dominant risk factor for stunting was age 24-59 months with a risk 2.5 times higher than the age of 6-11 months. Early initiation to breastfeeding is easy and has a long-term positive health benefit on the child.

## Recommendations

Promoting breast feeding benefits to mothers should begin before birth. Support from health personnel, especially officers who assist the birth process, should be increased.

It is important to reinforce the importance of early initiation to breastfeeding and clean drinking water sources as a prevention to stunting. Improvement of drinking water sources by replacing contaminated river water with clean pipe water should be practiced. Finally, it is important to introduce additional and more regular educational programs for pregnant women about how to prevent low birth weight in babies together with clear information on the benefits of early breastfeeding.

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