

## FACTOR ANALYSIS OF INTRANATAL AND POSTNATAL TOWARD STUNTING

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### Abstract

*Multidimensional factors caused stunting and intervention, mostly focusing on the first 1000 days of life. Maternal factors consist of prenatal, intranatal, and postnatal factors. This study was conducted to determine the intranatal and postnatal factors influencing the incidence of stunting. The design of this research was descriptive-analytic with a retrospectives approach. This study's population was children aged 1-3 years old using random cluster sampling and obtained 35 respondents as case group and 35 respondents as the control group. This study shows that there were variables associated with stunting such as labour history with odds ratio 0.103 (p-value: 0.001; 95% CI: 0.030-0.350) and basic immunization history with odds ratio 5.785 (p-value: 0.022; 95% CI: 1.285-26.028). Based on the finding, comprehensive health care is needed in preventing stunting*

**Keyword:** *Stunting, Intranatal, Postnatal, Labor history, Basic immunization history*

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### 1. Introduction

Stunting is the impaired growth and development that children experience from chronic malnutrition. The child mostly looks shorter than his age. Malnutrition occurred in pregnancy could cause stunting in children. However, children could be diagnosed with stunting when they are two years old. <sup>[1]</sup> There were 171 million children (167 million in developing countries) with stunting. While in Africa, stunting had stagnated since 1990 at about 40 %, and little improvement was anticipated. Asia showed a dramatic decrease from 49 % in 1990 to 28 % in 2010. There was a decrease in the number of stunted

children from 190 million to 100 million. It is estimated, this trend will continue. By 2020, Asia and Africa are estimated to have the same stunting number (68 million and 64 million, respectively).<sup>[2]</sup>

In 2017, there were 22.2%, or around 150.8 million children under five in the world, experiencing stunting. This figure had decreased compared to the stunting rate in 2000, namely 32.6%. In 2017, 55% of stunted children came from Asia, while more than a third (39%) from Africa. Of the 83.6 million stunted children under five were from Asia, the highest proportion came from South Asia (58.7%), and the lowest proportion was in Central Asia (0.9%).<sup>[3]</sup>

Stunting has long-term effects on individuals and society. Stunting results in diminished cognitive and motor development, reduced productive capacity and poor health. Stunting also increased the risk of degenerative diseases such as diabetes. When stunting was found before two years of age, it could result in poor cognitive abilities in childhood and adolescence. Stunting significantly affects the educational and economic state of the individual, household, and community levels.<sup>[4]</sup>

Several developing countries apply a multisectoral "convergence approach". To overcome stunting to be effective, a coordinated intervention is needed to target geographic areas and priority beneficiaries jointly.<sup>[5]</sup> The combination of different nutrition interventions involving different sectors has been successful in various countries.<sup>[6]</sup> Peru was one of the countries that had successfully overcome stunting. One of its success factors was political will and commitment at the highest levels and broad social participation. Support in the form of performance-based budgets, coordinated multisectoral programs, and equal distribution of incentives for households, health facilities, and local governments were other supporting factors. Convincing policymakers, public officials, and parents were essential to intervene in malnutrition in early childhood.<sup>[7]</sup>

WHO categorized the direct causes of stunting in children, namely household and family factors (maternal and home environmental factors), breastfeeding (inadequate practice), inadequate complementary feeding (poor quality food, inadequate practices, and food safety, and water), and infections (clinical and subclinical infections). This category includes contextual factors according to broad, community, and social factors, including health and health care; political economy; education; agriculture and food systems; society and culture; and water, sanitation, and the environment.

The causes and contextual factors that cause stunting in Indonesia are reviewed in the literature using global data; there were prenatal, intranatal, and postnatal factors from maternal factors.<sup>[8]</sup> The literature study stated that stunting was caused by low maternal education and a lack of knowledge about fulfilling nutritional intake in children. Stunting was also caused by not being given exclusive breastfeeding, complementary breastfeeding that was not according to age, history of birth with LBW, having a history of infectious diseases such as ARI and recurrent diarrhea, poor environmental sanitation, and low family socioeconomic status in fulfilling children's nutrition. <sup>[9]</sup> In this study, researchers tried to explore intranatal and postnatal factors toward stunting.

## 2. Method

Analytical research was conducted in this study using a retrospectives approach to discover intranatal and postnatal correlation toward stunting. This study's variable was the history of delivery, asphyxia, low birth weight, short birth length, gender, exclusive breastfeeding, basic immunization, and infectious diseases that have been suffered.

This study's population was children aged 1-3 years in the Pekalongan District Health Office's work area in 2018. Random cluster sampling was chosen to get health facilities as a sample and obtained three health facilities. Respondents being chosen using purposive sampling following inclusion criteria and obtained 35 respondents for the case group and 35 in the control group.

Data collected using a checklist. Primary data collected by interviewing respondents from interviews. The interviews were then synchronized with medical records. The research procedure began with making a research flow and conducted the research ethics permit. Researchers administered research permits to Bappeda and the Health

Office to obtained data collection permits for the primary health center, according to the cluster results. Researchers took client data, both primary and secondary data.

Collected data analyzed using Stata 14. Univariate data analyzed using frequency distribution, and the bivariate analysis using chi-square. The multivariate test used logistic regression with a 95% degree of confidence.

### 3. Results and Discussion

The results of the determinant studies of intranatal and postnatal studies show in Table 1:

**Table 1.** Distribution of Respondents Characteristics

Variable	n	%
<b>Gender</b>		
Male	38	54.29
Female	32	45.71
<b>History of delivery</b>		
Normal	43	61.43
with complication	27	38.57
<b>History of asphyxia</b>		
No	64	92.75
Yes	5	7.25
<b>History of low birth weight</b>		
Normal	59	84.29
LBW	11	15.71
<b>History of short birth length</b>		
Normal	59	84.29
Stunted	11	15.71
<b>History of exclusive breastfeeding</b>		
Exclusive	44	62.86
Not Exclusive	26	37.14
<b>History of basic immunization</b>		
Not Complete	16	22.86
Complete	54	77.14
<b>History of infectious diseases</b>		
Frequently Exposed	32	45.71
Rarely exposed	38	54.29

Table 1 shows that 15% of children under five born with a stunting history were diagnosed with malnutrition during their toddler years. This finding shows that the role of the golden period from 0-2 years can change the nutritional status of the child. <sup>[10]</sup>

In Table 1, more than half of children under five experienced exposure to infection in the last three months. Stunting is often associated with the incidence of infectious diseases in children and directly affects the child's appetite. During sickness, we will need more nutrition to speed up the recovery process. If the infection is prolonged and recurs, it can cause stunted growth. Children with upper respiratory tract infection characterized by coughs and colds, headaches for days or even up to a week, this condition influenced their appetite—that why during their sickness they could not have proper nutrition. They lose their appetite because they coughed some cases, the children were vomiting, nausea, and diarrhea. In this condition, they were at risk of experiencing dehydration and directly disturbed nutrition absorption. <sup>[11]</sup>

From the results of the bivariate analysis obtained, several factors had relations toward stunting. From table 2, we found that the history of delivery factors (p-value: 0.001; OR (CI): 0.098 (0.024- 0.354)) and basic immunization history (p-value: 0.004; OR (CI): 6.303 (1.452- 37.517)) were the factor which influencing stunting.

Child gender was not associated with stunting. Nirmalasari's finding in her previous study showed there were no differences between boys and girls in the incident of stunting. There were 5% girls and 11% of boys were thin, while 11% girls and boys were overweight. <sup>[12]</sup>

The childbirth process is closely related to preparing for childbirth since pregnancy. Midwives had an important role in preparing for delivery, especially during antenatal care, by providing knowledge for mothers and families. <sup>[10]</sup>

**Table 2.** Bivariate analysis on Intranatal and Postnatal toward stunting

Variable	p-value	OR	CI
Gender	0.055	0.391	0.133-1.141
History of delivery	0.000	0.098	0.024- 0.354
History of asphyxia	0.174	4.258	0.385- 215.897
History of low birth weight	0.325	1.937	0.433-9.931
History of short birth length	0.100	3.160	0.662- 19.999
History of exclusive breastfeeding	0.137	2.105	0.703-6.414
History of basic immunization	0.004	6.303	1.452- 37.517
History of infectious diseases	0.337	0.629	0.219- 1.797

A previous study conducted in East Java showed that there were 80% of pregnant women did not regularly perform ANC regularly. During ANC, pregnant women will receive a comprehensive examination, received folic acid and iron supplements, and proper health education such as nutritional education. These can prevent mothers from experiencing anemia and giving birth prematurely, and notably, the baby would have proper nutrition.<sup>[13]</sup>

Other studies stated that pregnancy with anemia in the first and second trimesters, potentially giving birth to a baby with weight low birth rate (LBW). LBW is one of the risk factors for stunting. This study finding is in line with the previous study, which stated that giving iron tablets during pregnancy can reduce stunting risk.<sup>[14]</sup>

The factors for babies born with asphyxia or prematurity did not show a significant relationship with stunting. Several studies had shown that a history of asphyxia was significantly associated with development, but there was no evidence that its impact on growth.<sup>[15]</sup>

The finding of this study shows that there was no significant relationship between exclusive breastfeeding with stunting. However, the previous study stated that toddlers who were not exclusively breastfed during the first six months had a greater stunting risk. It may be that stunting is not determined by factors of exclusive breastfeeding status

but is also influenced by other factors such as the quality of complementary foods, the adequacy of nutritional intake given to children every day, and the health status of the baby.<sup>[16]</sup>

Children with an incomplete basic immunization were 5.785 at risk of stunting. A previous study stated that children who received incomplete immunization had a 1.6 times risk of stunting than children who received complete basic immunization, and research conducted in Northwestern Ethiopia showed children with incomplete immunization were 5.6 times riskier of stunting. Another study stated that incomplete immunization had a direct effect on stunting. A study at the Biromaru Health Center stated children at age 2-5 years old with incomplete immunization had a risk of stunting 7.667 times greater than children with complete immunization.<sup>[17]</sup>

The results showed that there was no significant relationship between infectious diseases and stunting. However, indirectly, infectious diseases can cause stunting. Toddlers have low immunity, so they are vulnerable to exposure to infectious diseases, including diarrhea, especially toddlers with nutritional problems who get sick more easily. Due to reduced ability to fight disease, episodes of disease such as diarrhea will be prolonged or synchronous.<sup>[18]</sup>

**Table 3.** Multivariate intra-natal, post-natal and baby factor analysis of stunting

Step	Variable	p-Value	OR (CI)
Step 1	Gender	0.098	0.342 (0.095-1.219)
	History of delivery	0.001	0.099 (0.026- 0.382)
	History of asphyxia	0.552	0.422 (0.025- 7.248)
	History of low birth weight	0.719	1.438 (0.198- 10.436)
	History of short birth length	0.312	2.990 (0.358- 24.996)
	History of exclusive breastfeeding	0.229	2.363 (0.582-9.599)
	History of basic immunization	0.48	8.147 (1.016- 65.338)
	History of infectious diseases	0.228	0.447 (0.121-1.655)
Step 2	Gender	0.162	0.431 (0.132- 1.403)
	History of delivery	0.000	0.103 (0.029- 0.362)
	History of exclusive breastfeeding	0.506	1.516 (0.445- 5.163)
	History of basic immunization	0.057	4.538 (0.956-21.531)
	History of infectious diseases	0.381	0.582 (0.174-1.952)
Step 3	Gender	0.186	0.456 (0.141-1.461)
	History of delivery	0.000	0.104 (0.030- 0.357)
	History of basic immunization	0.041	4.872 (1.065- 22.291)
Step 4	History of delivery	0.000	5.785 (1.285-26.028)
	History of basic immunization	0.022	0.103 (0.031- 0.350)

Based on the Goodness on fit test, a p-value was obtained of 0.990. It indicates that the regression test relationship had a good quality, which means that the variables of labor history and basic immunization history related to stunting.

Problems that often occur in childbirth, such as prolonged delivery, indirectly affect the outcome in newborns. The finding of this study shows that childbirth history influenced stunting in children aged 1-3 years. Many studies suggested that a history of childbirth affects children's development and growth, but there was no strong evidence to support this statement.<sup>[15]</sup>

This study also shows the importance of basic immunization on preventing stunting. Basic immunization forms the child's immune system so that it can prevent disease transmission. The immunity helps growth and development optimally and so that it can prevent stunting. Rahmadani's previous study showed that LBW and immunization related to stunting. The efforts that can be made include providing education about the importance of complete basic immunization and fulfilling nutritional intake, and reducing stunting.<sup>[19]</sup>

#### 4. Conclusion

The intranatal and postnatal factors that influence the incidence of stunting are labor history and basic immunization history. Therefore, it is necessary to handle childbirth properly. The provision of basic immunization needs to be intensified to help prevent stunting.

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