

OPTIMIZING STUNTING PREVENTION: KEY DETERMINANTS IN BANJARNEGARA REGENCY

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ABSTRACT

The incidence of stunting in toddlers is a major nutritional issue in Indonesia. Data from the Nutrition Status Monitoring (PSG) over the past three years shows that stunting has the highest prevalence compared to other nutritional problems such as underweight, wasting, and obesity. The prevalence of stunting in toddlers increased from 27.5% in 2016 to 29.6% in 2017. Various factors influence the occurrence of stunting; however, these factors can vary by region. Detailed data on the determinants of stunting in children is crucial for informing government policies in addressing public health issues, particularly stunting. This study focuses on Banjarnegara Regency, which ranks among the top five regions with the highest stunting rates in Central Java. The objective of this research is to analyze the factors influencing stunting among children aged 2-5 years in Banjarnegara Regency. This quantitative study uses a case-control approach, with a population of all children aged 2-5 years. Data analysis includes univariate descriptive analysis and bivariate analysis using the Chi-Square test. The results indicate that education, economic status, environment, and birth length are associated with stunting in toddlers, whereas exclusive breastfeeding history is not associated with stunting.

Keywords: exclusive breastfeeding, risk factor, stunting

INTRODUCTION

The occurrence of stunting in children under five represents a significant nutritional challenge in Indonesia. According to the Nutrition Status Monitoring (PSG) data over the past three years, stunting has shown the highest prevalence compared to other nutritional issues such as underweight, wasting, and overweight. The prevalence of stunting increased from 27.5% in 2016 to 29.6% in 2017. (Kemenkes RI, 2018). Stunting is a condition of impaired growth and development in children due to prolonged malnutrition, leading to shorter stature and delayed cognitive development compared to peers of the same age (Rachman, 2018). This condition can hinder both physical and mental development (Kurnia Purwandini, 2013). Stunting is associated with an increased risk of morbidity, mortality, and delayed motor and cognitive abilities. The health status of infants and toddlers is a critical determinant of human resource

quality. There is clear evidence that maternal health and nutrition before pregnancy, during pregnancy, and during breastfeeding are crucial periods. The first 1,000 days, consisting of 270 days during pregnancy and 730 days in the child's first two years, is a sensitive period with irreversible consequences. These impacts affect not only physical growth but also mental development and intelligence, ultimately leading to suboptimal physical size and reduced competitiveness, resulting in low economic productivity (Friska, 2017).

UNICEF highlights that stunting is not caused by a single factor but by a combination of interrelated factors (WHO dan Unicef, 2012). Studies indicate that stunting may be influenced by energy intake, birth weight, maternal education level, household income, parenting practices, food diversity (Nugroho et al., 2021), exclusive breastfeeding, genetic factors, environment (Oktavianisya et al.,

2021), and maternal nutritional status during pregnancy (Paudel et al., 2012). However, the factors influencing stunting vary by region. Data on the determinants of stunting in children under five is essential for informing government policy in addressing public health issues, particularly stunting. This study focuses on Banjarnegara Regency, which ranks among the top five regions with the highest stunting prevalence in Central Java Province.

METHOD

Research Design

This study employed a quantitative research method with a case-control design. The study was conducted in stunting locus areas, specifically in the regions of Puskesmas Bawang 1 and Puskesmas Banjarnegara 2.

Population and Sample

The study population included all children aged 2-5 years residing in the designated

stunting locus areas. The sample consisted of 90 children aged 2-5 years who are selected using a non-probability sampling technique namely consecutive sampling.

Instruments

Data collection was conducted using both primary and secondary sources. Primary data were gathered through structured questionnaires, which assessed socioeconomic, environmental, and educational factors. Secondary data were obtained from medical records or the maternal and child health (KIA) books, focusing on respondent characteristics such as exclusive breastfeeding and birth length.

Data Collection and Analysis

Univariate analysis was used to describe the characteristics of the respondents. Bivariate analysis was performed to examine the relationship between independent and dependent variables using the Chi-Square test.

RESULTS AND DISCUSSION

Table 1. Characteristics of Research Respondents

Characteristic	Total	
	n	%
Education		
Basic-junior high school	49	54.4
Senior high School	28	31.1
Undergraduate	13	14.5
Income		
In accordance with the minimum wage	42	46.7
Below minimum wage	48	52.3
Environmental		
Inadequate environmental conditions	42	46.7
Adequate environmental conditions	48	52.3
Breastfeeding		
Exclusive breastfeeding	76	84.4
Non-exclusive breastfeeding	14	15.6
Birth length		
< 48 cm	13	14.4
≥ 48 cm	77	85.6
Height-for-age measurements		
Stunted	30	33.3
Not stunted	60	66.7

Table 1 presents the characteristics of the research respondents in terms of education, income, environmental conditions, breastfeeding practices, birth length, and height-for-age measurements. Most respondents had a basic or junior high school education (54.4%), while fewer had senior high school (31.1%) or undergraduate education (14.5%). Regarding income, 46.7% of respondents had incomes in accordance with the minimum wage, while 52.3% had incomes

below the minimum wage. Environmental conditions were reported as inadequate by 46.7% of respondents and adequate by 52.3%. Many respondents practiced exclusive breastfeeding (84.4%), while 15.6% did not. For birth length, 14.4% of children were born with a length of less than 48 cm, while 85.6% had a birth length of 48 cm or more. Stunting was observed in 33.3% of children, while 66.7% were not stunted.

Table 2. Relationship between respondent characteristics and stunting

Characteristic	Stunted		Not stunted		OR	P value
	n	%	n	%		
Education						
Basic-junior high school	25	83.3	24	40	-	<0.001
Senior high School	5	16,7	23	38.3		
Undergraduate	0	0	13	21.7		
Income						
In accordance with the minimum wage	4	13.3	38	63.3	0.089	<0.001
Below minimum wage	26	86.7	22	36.7		
Environmental						
Inadequate environmental conditions	21	70	21	35	4.333	0.004
Adequate environmental conditions	9	30	39	65		
Breastfeeding						
Exclusive breastfeeding	24	80	52	86.7	0.615	0.607
Non-exclusive breastfeeding	6	20	8	13.3		
Birth length						
< 48 cm	10	33.3	3	5.0	9.500	0.001
≥ 48 cm	20	66.7	57	95		

Children of mothers with a basic to junior high school education are significantly more likely to be stunted (83.3%) compared to those whose mothers have a senior high school (16.7%) or undergraduate education (0%). The p-value of <0.001 indicates a highly significant association between lower maternal education and stunting. The Odds Ratio (OR) cannot be calculated directly from the table. Low levels of parental education can increase the risk of malnutrition in children. Parents' education level is one of the causes of stunting, as

higher education is considered capable of making decisions in improving children's nutrition and health. High knowledge also affects parents in determining the fulfillment of family nutrition and parenting patterns, where improper parenting will increase the risk of stunting. In addition, the mother's education level can affect health status, which is related to the mother's role in the formation of children's eating habits, because those who prepare food start organizing menus, shopping, cooking, preparing food and distributing food are

mothers (Husnaniyah et al., 2020). Health literacy for mothers is very important, especially regarding nutrition and child health, given the rampant cases of stunting that afflict children in Indonesia (Fitroh & Oktavianingsih, 2020). A study shows that emphasis should be given by relevant agencies to intervene in the stunting problem by improving maternal education, promoting girls' education, improving household economic status, promoting contextualized child feeding practices, improving maternal nutrition education and counseling, and improving sanitation and hygiene practices (Muche et al., 2021).

Children from households with an income below the minimum wage are much more likely to be stunted (86.7%) compared to those from households with income in accordance with the minimum wage (13.3%). The OR of 0.089 suggests that a lower income is strongly associated with a higher likelihood of stunting. The p-value of <0.001 further confirms the statistical significance of this relationship. Socioeconomic conditions and residential sanitation are related to the occurrence of stunting. Economic conditions are closely related to the ability to fulfill nutritious intake and health services for pregnant women and toddlers (Kemenkes RI, 2018). Previous study shows that the variable family income level has a significance value of $p=0.018$ (OR=5.6), which means that the level of family income is related to the incidence of stunting in children aged 24-59 months (Setiawan et al., 2018). In the research of Aini et al., (2018) it is also known that the variable family income level is associated with the incidence of stunting in children aged 24-59 months with a value of $p=0.001$ (OR=5.385) (Elsa Nur Aini, Sri Achadi Nugraheni, 2018). Low socioeconomics is associated with the family's ability to meet children's nutritional intake. Families with high socioeconomic status are also associated with the ability to use better health facilities such as access to health care and medicines,

which can prevent stunting (Beal et al., 2018).

According to the survey results, differences in the distribution of wealth index (average contribution $> 84.7\%$) and length of maternal schooling (average contribution $> 22.4\%$) have a positive impact on the incidence of stunting. The difference in wealth index and maternal education has increased the contribution to the stunting incidence rate, to reduce stunting in poor communities requires initiatives that must be started on the distribution of social services including maternal and reproductive education in women of childbearing age, water and health facilities in remote areas (Musheiguza et al., 2021).

Inadequate environmental conditions are associated with a higher incidence of stunting (70%) compared to adequate conditions (30%). The OR of 4.333 indicates that children in inadequate environments are over four times more likely to be stunted. The p-value of 0.004 shows this is a statistically significant factor. Basic sanitation/environment is one of the risk factors for stunting. Hygiene practices are one of the important things in maintaining children's health. Washing hands with running water, washing food before processing, washing hands when processing food, washing hands before breastfeeding, and washing hands after defecating is one of the benchmarks that measure the clean-living behavior of everyone. Hand washing with running water has been linked to the incidence of stunting and prevention of diarrhea in children (Nasrul et al., 2015). Water facilities, sanitation, and poor behavior can trigger diarrhea, intestinal worms or enteropathy, infections in the intestines that have an impact on the nutritional status of children so that stunting can occur. Infections in these conditions directly affect nutritional status through loss of appetite, poor digestion, malabsorption of nutrients, chronic immune activation, and infections that divert nutrient and energy use such as

fever (Nasrul, 2019). In another study, it was found that there was a significant interaction between home sanitation, household water treatment and stunting (Torlesse et al., 2016). The incidence of stunting in children who do not have latrines is higher (35.3%) than children who have latrines (24%). While the comparison of families who do not use soap when washing hands (31.6%) is higher than families who use soap when washing hands (25.8%), and the last is families who use untreated water is higher (38.2%) than those who treat water (27.3%), so that hygiene in homes and individuals each tend to be poor and can increase the risk of diseases such as diarrhea which can increase the likelihood of stunting in children (Torlesse et al., 2016)(Nasrul, 2019).

Exclusive breastfeeding appears to have a protective effect, with a higher percentage of non-stunted children (86.7%) compared to those stunted (80%). However, this difference is not statistically significant, as indicated by the p-value of 0.607 and an OR of 0.615. The results of this study are not in line with research conducted by Lidia (2018), which states that there is a significant relationship between exclusive breastfeeding and the incidence of stunting in toddlers at the Lima puluh Health Center (Lidia Fitri, 2018). Nutrition obtained since the baby was born certainly greatly affects its growth including the risk of stunting. Failure to implement early breastfeeding initiation (IMD), failure of exclusive breastfeeding, and early weaning can be one of the factors for stunting (Kemenkes RI, 2018). However, in the incidence of stunting, many factors can influence and are interrelated. In this study, exclusive breastfeeding did not affect the incidence of stunting because it was possible that in this study respondents provided good parenting to their children, thus reducing the incidence of stunting. This is in accordance with the results of previous research which states that there is no relationship between

exclusive breastfeeding and the incidence of stunting (AA, 2018).

Birth length is strongly associated with stunting. Children with a birth length of less than 48 cm are much more likely to be stunted (33.3%) compared to those with a birth length of 48 cm or more (5%). The OR of 9.500 indicates that children born shorter than 48 cm have a significantly higher risk of stunting. The p-value of 0.001 confirms the statistical significance of this finding. The results of the OR calculation show that respondents who are long at birth have a 9.5 times risk of stunting to experience stunting status during toddlerhood, which means that the birth length of the baby will have an impact on subsequent growth. This is in accordance with research conducted previously, namely infants with abnormal body length or <48 cm when born, have a risk of being stunted 2.65 times compared to infants born with normal body length (Hamal et al., 2021). A child's birth length is determined from the beginning of pregnancy. During pregnancy, poor maternal conditions such as malnutrition, stress, or having comorbidities can inhibit fetal growth and development. This greatly affects the development of children under five, which later if the baby born has an abnormal body length, it is likely to have an impact on the child's height in early childhood and adulthood (Dorelien Audrey M, 2015).

CONCLUSION

This study identifies key determinants of stunting among children aged 2-5 years, including maternal education, household income, environmental conditions, and birth length. Children of mothers with lower education levels, from households with income below the minimum wage, living in inadequate environmental conditions, and born with a length of less than 48 cm are at significantly higher risk of stunting. Although exclusive breastfeeding showed a protective trend, it was not statistically significant in this study. These findings emphasize the

multifactorial nature of stunting and the need for targeted interventions. To address stunting, it is crucial to enhance maternal education and improve household income in vulnerable communities. Improving environmental conditions through better sanitation and hygiene practices is also essential. Public health programs should continue promoting maternal nutrition and healthcare during pregnancy to ensure proper fetal growth, alongside reinforcing the importance of exclusive breastfeeding. These combined efforts are vital to reducing stunting and improving child health outcomes in the long term.

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