



Factors Influencing the Incidence of Stunting in Jaya Bakti Village, Pagimana District, Banggai Regency

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Abstract

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BACKGROUND: Stunting is a chronic malnutrition problem caused by a lack of nutrition for a long time which leads to abnormal growth in children, such as lower or shorter height than the standard age.

AIM: Therefore, this study aims to determine the factors associated with the incidence of stunting at the age of 12–60 months in Banggai Regency, Indonesia, in 2020.

METHODS: Observation analysis and cross-sectional approach were used in this study and the sample size was 161 toddlers at the age of 12–60 months. The data were obtained through observations and direct interviews using questionnaires and were processed and analyzed using the Chi-square test.

RESULTS: The results showed that 51.6% of children below 60 months were with stunting and 48.4% had normal nutritional status, while there were 65.8% of proper birth lengths. Chi-square test results showed a significant relationship between birth length ($p = 0.000$), birth weight ($p = 0.253$), exclusive breastfeeding ($p = 0.000$), various types of food ($p = 0.003$), frequency of feeding ($p = 0.000$), hygiene practices ($p = 0.000$), and growth monitoring ($p = 0.000$) with the incidence of stunting, and there was no relationship, such as birth weight ($p = 0.253$) with the incidence of stunting in children below 60 months in Jaya Village Bakti, Pagimana District, Banggai Regency.

CONCLUSION: The sample is limited to the group of toddlers from 12 to 60 months; therefore, further study on 0–11 months is recommended in Jaya Bakti Village, Pagimana District, Banggai Regency.

Introduction

Stunting is a chronic malnutrition problem caused by a lack of nutrition for a long time which leads to abnormal growth in children, such as lower or shorter height than the standard age [1]. As described by the United Nations Children Fund, stunting is influenced by many factors such as food intake and conditions of infectious diseases. Meanwhile, several studies have shown that nutritional status is caused by medical conditions, family socioeconomic status, and sociocultural. Moreover, the main factors that cause stunting include unbalanced food intake, low birth weight (LBW), and infectious diseases. Similarly, a previous study stated that toddlers with LBW have a 2.3 times greater risk of stunting than the normal standard [2], [3], [4], [5].

A limit of tolerance for stunting (short stature) as stated by the WHO is a maximum of 20% or one-fifth of the total number of children below 60 months. The results of Basic Health Research [1] showed that

approximately 10.5 million children die every year due to malnutrition and 98% of these deaths were reported in the developing countries. In 2007, Riskesdas stated that the prevalence of stunting was at 36.8% with a short category of 18.0% and very short by 18.8%. In 2010, this value declined by 35.6% to a short category of 17.1% and very short of 18.5%, and increased to 37.2% in 2013 with the short category of 19.2% and very short as 18.0%.

From this incidence, it is shown that the prevalence of stunting in Indonesia increased by 1.6% from 2010 to 2013 or 0.4%/year. In 2018, it decreased by 30.8% with a short category of 19.3% and very short of 11.5%; however, this value is far from the tolerance limit set by the WHO [4]. From the Profile of the Central Sulawesi Health Office [6], the stunting data for Central Sulawesi Province are 29.9% and Banggai Regency are 19.9% in 2019. The prevalence of stunting below 60 months in the Banggai Regency is considered low at the age of 10 years, where stunting is concentrated. Meanwhile, the area with high prevalence is the Pagimana

subdistrict, especially Jaya Bakti Village, that has 37.8% in 2018, and in 2019, it decreased to 35.9%, while at the first weighing in February 2020, it reached 28.9% [7]. Therefore, this study aims to determine the factors associated with the incidence of stunting at the age of 12–60 months in the Jaya Bakti Village, Pagimana District, Banggai Regency.

Research questions

The factors are associated with the incidence of stunting at the age of 12–60 months in the Jaya Bakti Village, Pagimana District, Banggai Regency.

Objectives

This study aims to determine the factors associated with the incidence of stunting at the age of 12–60 months in the Jaya Bakti Village, Pagimana District, Banggai Regency.

Methods

Design study

Observational analysis with a cross-sectional approach was used and was carried out in September 2020. The population was 273 toddlers from Jaya Bakti Village, while the samples that were selected using the size formula include 161 toddlers at the age of 12–60 months. The dependent variable includes the incidence that is categorized into stunting and not stunting. Meanwhile, the independent variables were birth length and weight, exclusive breastfeeding, various types of food, frequency of feeding, hygiene practices, and growth monitoring.

Data collection

Data were from observations and direct interviews using questionnaires on birth weight body length, breastfeeding practice, various types of food, feeding frequency, hygienic practice, and growth monitoring. Furthermore, there were also data from the Banggai District Health Office and Pagimana Public Health Center about stunting incidence and other data.

Data analysis

The analysis was carried out by univariate and bivariate with the Chi-square test, while SPSS version 20.0 was used for data analysis.

Results

The distribution of respondents based on characteristics is shown in Table 1 and the prevalence of stunting in children aged 12–60 months in Jaya Bakti Village is 51.6%. In this study, the toddlers had more normal birth length ≥ 48 cm (65.8%), normal birth weight ≥ 2500 g (93.2%), received exclusive breastfeeding 81.4%, varied well 67.7%, good feeding frequency 70.8%, good hygiene practice 62.7%, and good growth monitoring 54.7%, as shown in Table 1.

Table 1: Distribution of toddler characteristics

Variables	n	%
Stunting incidents		
Normal	78	4.4
Stunting	83	51.6
Birth body length		
Normal ≥ 48 cm	106	65.8
Low < 48 cm	55	34.2
Birth weight		
Normal ≥ 2500 g	150	93.2
Low < 2500 g	11	6.8
Breastfeeding		
Exclusive breastfeeding	131	81.4
Not exclusive breastfeeding	30	18.6
Diverse types of food		
Good	109	67.7
Less good	52	32.3
Feeding frequency		
Good	114	70.8
Less good	47	29.2
Hygienic practice		
Good	101	62.7
Less good	60	37.3
Growth monitoring		
Good	88	54.7
Less good	73	47.3

Based on the bivariate analysis results, the variables that were significantly associated with the incidence of stunting were birth length ($p = 0.000$), exclusive breastfeeding ($p = 0.000$), various types of food ($p = 0.003$), frequency of feeding ($p = 0.000$), good hygiene practice ($p = 0.000$), and growth monitoring ($p = 0.000$). However, birth weight was not associated with stunting ($p = 0.253$) (Table 2).

Table 2: Bivariate analysis of variables associated with the incidence of stunting

Variable	Not stunting n (%)	Stunting n (%)	χ^2	p-value
Birth body length				
Normal ≥ 48 cm	77 (72.6)	29 (27.4)	72.723	0.000*
Low < 48 cm	1 (1.8)	54 (98.2)		
Birth weight				
Normal ≥ 2500 g	75 (50)	75 (50)	2.119	0.253
Low < 2500 g	3 (27.3)	8 (72.7)		
Breastfeeding				
Exclusive breastfeeding	76 (58)	55 (42)	25.769	0.000*
Not exclusive breastfeeding	2 (6.7)	28 (93.3)		
Diverse types of food				
Good	62 (56.9)	47 (43.1)	9.611	0.000*
Less good	16 (30.8)	36 (69.2)		
Feeding frequency				
Good	71 (62.3)	43 (37.7)	29.921	0.000*
Less good	7 (14.9)	40 (85.1)		
Hygienic practice				
Good	68 (67.3)	33 (32.7)	38.677	0.000*
Less good	10 (16.7)	50 (83.3)		
Growth monitoring				
Good	68 (93.2)	5 (6.8)	106.863	0.000*
Less good	10 (11.4)	78 (88.6)		

Discussion

In 2020, the prevalence of stunting in children aged 12–60 months in Jaya Bakti Village was 51.6%. This value is in the high category (>20%) and becomes a public health problem. Statistically, there is no significant relationship between birth weight and the incidence of stunting. Therefore, stunting is not caused by a difference between normal and LBW, it is caused by a lack of nutritional statuses such as food intake and good nutritional intake. The variables associated with stunting include birth length, exclusive breastfeeding, various types of food, frequency of feeding, good hygiene practices, and growth monitoring of the incidence of stunting.

The study in Jaya Bakti Village shows that children below 60 months that are not receiving exclusive breastfeeding and have a risk of developing stunting are 28 (93.3%) compared to toddlers that received it. These results are in line with a study conducted by Badriyah and Syafiq [3], Lestari *et al.* [8], and Latifah *et al.* [9] which stated that the incidence of stunting is influenced by exclusive breastfeeding because breast milk contains antibodies that increase the baby's immune system. Therefore, the baby is prevented from sickness such as diarrhea, while malnutrition disturbed and posed the baby at risk which affects growth and causes stunting. Moreover, the study in Nigeria found that the predictors increasing the odds of childhood stunting are as follows: Male gender, age above 11 months, multiple birth, LBW and maternal education, low maternal body mass index, poor maternal health-seeking behavior, poor household wealth, and short birth interval. This study showed that individual and community level factors are significant determinants of childhood stunting in Nigeria [10]. Furthermore, the results of this study are in line with a previous study conducted in Petobo Village, Palu, which showed that the main risk factor is exclusive breastfeeding [5]. In addition, other studies in Yogyakarta showed that exclusive breastfeeding is a risk factor for stunting in children aged 6–24 months [11].

Dietary diversity and the frequency of offering meals have a significant relationship with the incidence of stunting. In children below 60 months, the diversity of food is lower due to poor parents and low family purchasing power in providing food for children [12]. Meanwhile, the frequencies present the results of the mother's knowledge on the importance of feeding frequency in children. Many studies showed that diverse of dietary and frequency of offering meals have a relationship with the incidence of stunting. Similarly, a previous study conducted in Southeast Ethiopia, showed that the frequency of offering meals influenced the incidence of stunting [13]. This is in contrast to a study that stated that food diversity and feeding frequency were not risk factors for stunting. This

difference is because the quantity of food is not among the study variables. In 2017, a study in Ethiopia stated that responsive eating was associated with increased food intake and linear growth. This responsive feeding also increases the child's emotional relationship with the mother and food intake [10]. A previous study in Aligarh stated that dietary diversity is a significant predictor of stunting. Therefore, interventions aimed at improving dietary diversity are required to reduce the burden of stunting among infants and young children [14]. Meanwhile, an increase in consumption of nutritious local foods has the potential to reduce stunting in this vulnerable population as stated in a study by Ecuador [15].

Evidence suggests that 10 multisectoral and nutrition-specific evidence-based interventions could reduce child stunting by 20%, if scaled to 90% coverage. These interventions include folic acid supplementation; iron and iron-folic acid supplementation; multiple micronutrient supplementation; calcium supplementation; iodine fortification through the iodization of salt; maternal supplementation with balanced energy and protein; delayed cord clamping; neonatal Vitamin K administration; Vitamin A supplementation; and kangaroo mother care for the promotion of breastfeeding and care of preterm infants and those who are small for gestational age. Hygiene practices and growth monitoring based on the results of the Chi-square test have a significant relationship with the incidence of stunting. This is due to the implementation of poor hygienic practices by the people that have an impact on the intake consumed by toddlers. Meanwhile, toddlers that consume food due to poor hygienic practice increase the risk of contracting an infectious disease. These diseases are usually characterized by appetite disorders, vomiting, or diarrhea, therefore, that the toddlers' intake reduces and causes negative implications for growth. A previous study conducted by Rah *et al.* [16] stated that toddlers with good hygiene practices, such as the washing of hands with soap after defecating, before, and after meal, reduce the risk of children with stunting by 14%, while hands washing with soap before meals reduce the risk by 15%. Furthermore, a previous study showed that good hygiene behavior by mothers or caregivers of toddlers has a proactive effect on the incidence of stunting. Meanwhile, the study in a rural area of Ethiopia showed that higher stunting rates with an increase in the age of children highlight the need for continuous interventions, as efforts to improve nutrition and WASH behaviors are most effective early in promoting long-term health outcomes for children [17]. This is in line with a cross-sectional study in India on the household environment and stunted children that identified strong associations between WASH and stunting [18].

Children with LBW accompanied by inadequate food consumption, health services improper care, and frequent infections of the growth period will continue

to result in hampered stunted growth and produce stunted children. By monitoring growth, it was found that mothers still lack the awareness of bringing their children to monitor growth. This shows that toddlers with regular growth monitoring at the Posyandu have a balanced nutritional status. Therefore, the level of attendance at an active Posyandu has a big influence on monitoring nutritional status, as mothers get the latest health information which is useful for a healthy lifestyle. This study is in line with Destiadi *et al.* [19] which stated that there is a relationship between growth monitoring and the incidence of stunting. Therefore, toddlers that come to the Public Health Centre and weigh regularly have their nutritional and health status monitored. However, a previous study not in line with growth monitoring knowledge level of the mothers is high and showed an insignificant effect on stunting, wasting, and underweight among children 0–18 months in the Tamale Metropolis [20].

Conclusions and Suggestions

Based on the results, birth weight has no relationship with the incidence of stunting in children aged 12–60 months in Jaya Bakti Village. Statistically, there was a significant relationship between the variables of body length, exclusive breastfeeding, various types of food, feeding frequency, good hygiene practices, and growth monitoring. Therefore, health workers are expected to improve on the programs that have been implemented and increase information related to stunting. Furthermore, stunting management program needs to be carried out periodically to ensure proper implementation of activities and targets. Furthermore, Public Health Centre officers, especially midwives and nutrition workers, are expected to actively meet with the community to provide information on proper feeding patterns to parents, especially mothers with stunted children below 60 months. Therefore, parents need to pay more attention to the fulfillment of nutrition for children below 60 months. Hence, further studies on the factors that cause stunting are recommended and because stunting as a problem SDGs and a target in Indonesia and every region in Indonesia using planning and collaboration with other sector not only in health service.

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