

RISK FACTORS FOR STUNTING INCIDENTS IN TODDLERS AGED 6-24 MONTHS: A CASE STUDY IN JENEPONTO DISTRICT

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ABSTRACT

Stunting is a problem of growth and development in young children. Stunting in Indonesia is still above the threshold set by WHO, which is 21.6%. The prevalence in South Sulawesi reaches 27.2%, and the district with a high prevalence is Jeneponto Regency, with a percentage of 39.8%. This case-control study aimed to analyze the risk factors for stunting in children aged 6-24 months in Bontomatene Village, Jeneponto Regency, South Sulawesi, Indonesia. The study was conducted from January to February 2024, with a sample of 51 participants (17 cases, 34 controls). Data were collected using a questionnaire and analyzed using the chi-square test. The results showed that maternal height ($p=0.006$) and low birth weight ($p=0.006$) were significant risk factors for stunting, while the culture of food taboos was not a risk factor ($p=0.333$). To address the risk factors, the study recommends ensuring balanced nutrition in the first 1,000 days of life, promoting exclusive breastfeeding, and monitoring the growth and nutritional status of children under five. Additionally, providing education to families with food taboos to encourage a positive attitude towards diverse, nutritious foods is crucial.

ABSTRACT

Stunting merupakan masalah pertumbuhan dan perkembangan pada anak usia dini. Stunting di Indonesia masih berada di atas ambang batas yang telah ditetapkan oleh WHO yaitu 21,6%. Prevalensi di Sulawesi Selatan mencapai 27,2% dan kabupaten dengan prevalensi tinggi yaitu kabupaten jeneponto dengan persentase 39,8%. Penelitian ini bertujuan untuk menganalisis faktor risiko kejadian stunting pada balita usia 6-24 bulan. Penelitian ini merupakan penelitian case control, dilakukan di Desa Bontomatene Kabupaten Jeneponto pada bulan Januari sampai Februari 2024 dengan jumlah sampel 51 (17 kasus dan 34 kontrol). Instrumen penelitian menggunakan kuesioner. Analisis data dengan uji chi square. Berdasarkan hasil analisis diperoleh $p=0,333$ yang berarti budaya pantangan makanan bukan faktor risiko kejadian stunting. Tinggi badan ibu merupakan faktor risiko kejadian stunting ($p=0,006$). BBLR merupakan faktor risiko kejadian stunting ($p=0,006$). Diperlukan gizi yang seimbang pada 1000 Hari Pertama Kehidupan (HPK), disertai upaya pencegahan penyakit melalui imunisasi dan pola hidup bersih memberikan edukasi kepada keluarga yang memiliki pantangan makan untuk memiliki sikap positif terhadap berbagai jenis makanan yang bergizi dan seimbang.

INTRODUCTION

Stunting is a growth and development problem that occurs in early childhood in Indonesia (Sari et al., 2021). Good nutrition for a child is important for their future health, especially during the first 1.000 days of life (Tjajo dkk., 2022). According to the 2022 Indonesian Nutritional Status Survey, Indonesia's stunting prevalence was 21.6%. The prevalence in South Sulawesi reached 27.2%, with the highest prevalence of stunting in Jeneponto Regency, South Sulawesi, reaching 39.8% (SSGI, 2022). There are 20 community

health centers in the district, one of which is the Bontomatene Community Health Center. The percentage of stunted toddlers at the Bontomatene Health Center in 2021 is 30.4% (Harmil, 2021). Stunting is a nutritional status based on the Length/Height-for-Age (PB/U or TB/U) index in the standard anthropometric assessment of children's nutritional status, with measurement results at the threshold (Z-Score) <-2 SD to -3 SD (short/stunted) and <-3 SD (very short/severely stunted) (Permenkes, 2020). Many factors can cause stunting in early childhood.

The causes of stunting can be direct and immediate. Food intake, disease infection, low birth weight (LBW), and genetic factors are the immediate reasons for stunting, while environmental and social factors are not direct causes (Maineny dkk., 2022). Existing cultural traditions or customs in society, such as food taboos and improper eating patterns, can result in nutritional problems, including stunting in toddlers (Darpitoningrum dkk., 2022). Cultural factors influence food consumption, especially among toddlers and pregnant mothers. Beliefs in myths and taboos regarding certain foods are still prevalent in Jeneponto Regency. Research conducted by Arilismawati et al, 2022 states that dietary restrictions are associated with the incidence of stunting (Sarilismawati dkk., 2022).

Maternal factors before pregnancy, including stature (weight and height) and nutritional intake, influence the occurrence of stunting. Pregnant mothers with a height <150 cm, with a proportion of 31.3%, have an influence on babies being born with malnutrition, with a birth weight <2500 grams (Eka, 2018). A previous study by Wiwid et al, 2020 states that maternal height is a significant cause of stunting (Andari et al, 2022). The prevalence of short stature (<150 cm) in women is a risk factor in Indonesia (30.5%) and South Sulawesi (28.9%) (RISKESDAS, 2018).

In developing countries, low birth weight (LBW) remains a nutrient deficiency problem. Based on research by Diah and Riska in 2020, there is a connection between LBW status and the incidence of stunting (Ratnasari and Endriani, 2020). According to the 2021 Indonesian Nutritional Status Survey, the LBW rate in Indonesia has reached 6.6%, while in South Sulawesi, it has reached 7.7% (SSGI, 2021). In Jeneponto Regency in 2019, there were 65 infant deaths (29 male and 36 female), and 24 of these were attributed to LBW (Harmil, 2021).

Based on the above data, stunting in early childhood requires special attention because it can hinder the physical and cognitive development of children. Stunting is associated with an increased risk of disease and death, as well as impaired motor and cognitive development (Akbar & Mursal, 2023). However, stunting remains a potential health problem that needs to be addressed (Sari, et al., 2021). The purpose of this study was to analyze the risk factors for stunting in toddlers aged 6-24 months in Bontomatene Village, Jeneponto Regency, with variables including cultural food taboos, maternal height, and birth weight.

METHOD

Types of research

This kind of research employs a case-control study and is analytical observational research. Analyzing risk variables for stunting in case and control samples in Jeneponto Regency and measuring cultural restrictions on eating, low birth weight and maternal height.

Research Location and Time

This research was conducted in Bontomatene Village, Jeneponto Regency. This study was conducted between January – February 2024. Bontomatene Village was one of the areas in Jeneponto district with high prevalence of stunting

Population and Sample

The population in this study were all consisted of toddlers aged 6-24 months and sample was toddlers aged 6-24 months in Bontomatene Village, Jeneponto Regency. Sampling was carried out using the Total Sampling method, The sample size ratio between cases was 1:2, where the sample consisted of 15 respondents as the case group and 30 respondents as the control group, so the total sample size was 45. The case group consisted of stunted toddlers, whereas the control group consisted of normal toddlers.

Data collection

Researchers collected the following primary data directly from participants: Family identity information (mother's name, age, occupation, education, ethnicity; father's name, occupation, education; child's name, gender, date of birth, age). Maternal anthropometric measurements (mother's height), Toddler anthropometric measurements (weight and height/length). These primary data were obtained through interviews using structured questionnaires. Researchers also obtained secondary data from the Bontomatene Community Health Center in Jeneponto Regency, which included data on all toddlers in Bontomatene Village.

Processing and analysis of data

Stunting nutritional status data, namely the results of children's height data processed using the WHO Anthro application, were categorized as stunting if < -2 SD and normal if -2 SD to 3 SD. Food taboo questionnaire data were obtained through interviews using a questionnaire. The mothers' height questionnaire data were obtained by measuring the soles of the feet to the top of the head using a microtoise. It is said to be at risk if the mother's height is < 150 cm, where as there is no risk if the mother's height is ≥ 150 cm. The birth weight questionnaire data were obtained from the KIA Book. It is said to be at risk if the birth weight is < 2500 g and not at risk if the birth weight \geq is 2500 g.

Univariate analysis was used to determine the distribution of each variable, such as cultural abstinence from eating, maternal height, and low birth weight, and bivariate analysis was used to determine cultural abstinence from eating as a risk factor for stunting, maternal height as a risk factor for stunting, and birth weight. Low was a risk factor for stunting using the chi-square test in SPSS.

RESULTS

Table 1

Distribution of Respondents Based on Mother's Age, Mother's Occupation, Mother's Education, Mother's Ethnicity, Father's Occupation, Father's Education, Toddler's Gender and Toddler's Age.

Characteristics Respondent	Case		Control		p value
	n	%	n	%	
Mother's Age					
19-23 Years	3	17.6	7	20.6	0.714
24-29 Years	3	17.6	10	29.4	
30-35 Years	4	23.5	7	20.6	
36-40 Years	4	23.5	6	17.6	
41-45 Years	2	11.8	4	11.8	
46-50 Years	1	5.9	0	0	
Work Mother's					
Civil servants/TNI/ Polri	1	3.9	3	8.8	0.922
Employee Private	0	0	1	2.9	
Trader	0	0	1	2.9	
Farmer	1	5.9	2	5.9	
Honorary	1	5.9	1	2.9	
IRT	14	82.4	26	76.5	
Mother's education					
Finished elementary school	5	29.4	6	17.6	0.503
Finished middle school	0	0	3	8.8	
Finished high school	8	47.1	18	52.9	
College	4	23.5	7	20.6	
Mother's tribe					
Makassar	16	94.1	32	94.1	1,000
Buginese	1	5.9	2	5.9	
Father's occupation					
Civil servants/TNI/ Polri	0	0	1	2.9	0.728
Employee private	1	5.9	3	8.8	
Trader	1	5.9	6	17.6	
Businessman	1	5.9	1	2.9	
Farmer	12	70.6	18	52.9	
Laborer	1	5.9	0	0	
Retired	0	0	1	2.9	
Fisherman	0	0	1	2.9	
Driver	0	0	1	2.9	
Etc	1	5.9	2	5.9	
Father's education					
Finished elementary school	4	23.5	10	29.4	0.935
Finished middle school	2	11.8	4	11.8	
Finished high school	9	52.9	16	47.1	
College	2	11.8	3	8.8	
Etc	0	0	1	2.9	
Gender toddler					
Man	7	41.2	14	41.2	0.508
Woman	10	58.8	20	58.8	
Age toddler					
6-10 Months	3	17.6	10	29.4	0.507
11-15 Months	6	35.3	11	32.4	
16-20 Months	5	29.4	7	20.6	
21-24 Months	3	17.6	6	17.6	
Total	17	100	34	100	

Source: Primary Data, 2024

Based on Table 1, the results of the analysis using chi-square with $\alpha = 0.05$, showed that the maternal age pvalue was $0.714 > 0.05$, meaning that the maternal age characteristics between

cases and controls were the same or there was no difference. Based on the mother's occupation, the value obtained was $0.922 > 0.05$, meaning that the characteristics of the mother's work between cases and controls were the same, or there was no difference. The distribution based on maternal education obtained a value of $0.503 > 0.05$, meaning that the characteristics of maternal education between cases and controls were the same, or there was no difference. The distribution based on the mother's ethnicity obtained a value of $1.000 > 0.05$, meaning that the characteristics of the mother's ethnicity between cases and controls were the same or there was no difference. The distribution based on the father's occupation obtained a value of $0.728 > 0.05$, meaning that the father's educational characteristics between cases and controls were the same or there was no difference. The distribution based on fathers' education obtained a value of $0.935 > 0.05$, meaning that the fathers' educational characteristics between cases and controls were the same or there was no difference. The distribution based on the gender of toddlers obtained a value of $0.508 > 0.05$, meaning that the gender characteristics of toddlers between cases and controls were the same, or there was no difference. The distribution based on the age of toddlers obtained a value of $0.508 > 0.05$, meaning that the age characteristics of toddlers between cases and controls were the same or there was no difference.

Table 2
Sample Distribution Based on Food Taboo Culture, Maternal Height
and Low Birth Weight on Stunting Incidence

Characteristics Respondent	Case		Control		p value	OR
	n	%	n	%		
Toddler Food Taboo Culture						
Yes	1	5.9	0	0	0.333	3,125
No	16	94.1	34	100		(2,086-4,681)
Mother's Height						
<150cm	6	75	2	25	0.006	8,727
≥150 cm	11	25.6	32	74.4		(1,531-49,760)
Low Birth Weight						
<2500 gr	5	83.3	1	16.7	0.006	13,750
≥2500 gr	12	26.7	33	73.3		(1,454-129,987)
Total	17	100	34	100		

Source: Primary Data, 2024

Based on the results of the analysis using chi-square with $\alpha = 0.05$, the result was $p = 0.333$, which means that the culture of food restrictions is not a risk factor for stunting. The OR calculation results showed that a culture of food abstinence score of yes was 3.125 times more likely for toddlers to experience stunting than a culture with a food abstinence score of no. The results of this study showed that 1 (5.9%) toddler who had food restrictions experienced stunting and 0 (0%) normal toddlers, while with a score of no there are 16 (94.1%) stunted toddlers and 34 (100%) stunted toddlers. Normal toddlers, so that the total number of food taboo cultural scores for toddlers yes% is 1 (2%) toddlers, and there are 50 (98%) toddlers with a score of no.

Based on the results of the analysis using chi-square with $\alpha = 0.05$, the result was $p = 0.006$, which means that the mother's height is a risk factor for stunting. As shown in table 2, the highest maternal height was <150 cm in the case group with 6 (75%) toddlers, while in the control group it was ≥150 cm with 32 (74.7%) toddlers. The OR calculation results show that a mother's height of <150 cm is 8.727 times the risk of her child experiencing stunting compared to a mother's height of ≥150 cm.

Based on the results of the analysis using chi-square with $\alpha = 0.05$, the result was $p = 0.006$, which means that LBW is a risk factor for stunting. Table 2 shows that the highest percentage is of toddlers with a birth weight < 2500 g, namely 5 (83.3%) toddlers in the case group, while in the control group ≥ 2500 gr is 33 (73.3%) toddlers in the control group. The OR calculation results show that a birth weight of < 2500 g has a 13,750 times risk of experiencing stunting compared to a birth weight of ≥ 2500 g.

DISCUSSION

Families play an important role in preventing stunting in children. However, in situations found in the field, families continue to be influenced by the local culture regarding how to provide food to children. For example, families continue to believe in myths and beliefs regarding what is forbidden to eat. The results of this study are in line with research conducted by Yuwanti, et al. in 2021, which stated that certain food restrictions were not related to the incidence of stunting. The results of this study are in line with the research conducted by Ibrahim et al. in 2021, which stated that there was no significant relationship between food beliefs and the incidence of stunting (Ibrahim et al. 2021). There are families who have taboos against consuming fish with confidence that their son-consuming fish will experience worms. Although there was no significant relationship in this study, some parents did not provide certain foods to their children for health reasons (allergies). The results of this study are not in accordance with research conducted by Hermila et al. in 2023; food restrictions are a risk factor for stunting (Hermila, Khairani, and Dewi 2023), and research conducted by Wulandari in 2023 stated that the existence of a culture of food restrictions or nutritional socio-culture in society can cause the risk of stunting (Wulandari, Rahayu, and Akbar 2023). Research conducted by Delima, et al. in 2023 stated that local sociocultural aspects in a community influence the nutritional intake of family members, which will indirectly be related to the incidence of stunting (Delima, Firman, and Ahmad 2023). This happens because of the mother's high level of education, with the average last education level being high school.

In this research, the other factors contributing to the risk of stunting are the high- band Mother. Based on the analysis results using chi-square with $\alpha = 0.05$, the result obtained = 0.006, which means that the mother's height is a factor risk stunting incident. The OR calculation results show that a mother's height < 150 cm is 8.727 times the risk of her child experiencing stunting compared to a mother's height \geq of 150 cm. The results of this research are in line with research conducted by Intan Nuraini, et al in 2023 which stated that there was a relationship between maternal height and the incidence of stunting, research conducted by Yolanda Oktavia et al in 2023 stated that there was a relationship between maternal height and the incidence of stunting, research conducted by Kamila and Irwanto in 2021 stated that maternal height influences the incidence of stunting. This research contradicts the research conducted by Saputri et al. in 2023, which stated that maternal height was not related to stunting, and research conducted by Rizqita and Lailatul in 2020 stated that maternal height was not related to the incidence of stunting (Wulandari and Muniroh 2020). One of the factor associated with the incidence of stunting is the mother's short height. Mothers with short height also tend to have children with short height or stunting, while mothers with normal or tall body posture usually also have children with normal height for their age. One factor that can cause stunting is the mother's height, which is genetically inherited by the offspring. Genetic factors that can influence a child's height include mother's height, whether tall or short. This causes a cycle of malnutrition and poor growth, which impacts the growth of offspring for several generations (Pringsewu et al, 2023).

This proved that low birth weight was a risk factor. Based on the analysis results using *chi square* with $\alpha = 0.05$, the result obtained was = 0.006, which means that LBW is a factor risk stunting incident. The OR calculation results show that birth weight < 2500 g has a 13,750 times risk of stunting

than a birth weight \geq of 2500 g. The results of this research are in line with research conducted by Devi Kartika et al in 2024 explaining that there is a relationship between LBW and the incidence of stunting (Wulandari Kartika et al. 2024), research conducted by Yulianti, Rachmawaty and Abdul in 2023 said that there is a relationship between LBW and the incidence of stunting, research conducted by Marantika and Endang in 2023 said that the incidence of LBW is a risk factor for stunting. This research is not in line with research conducted by Maya Trisiswati in 2021, which states that there is no significant or meaningful relationship between LBW and the incidence of stunting. Sukmawati et al in 2023 stated that there is no relationship between LBW and stunting. A history of LBW can cause stunting and low birth weight, which are the main factors that increase infant mortality, morbidity, and disability. Low birth weight also has a long-term impact on future life, with one of the long-term effects on low birth weight babies being developmental disorders, including stunting (Ratnasari and Endriani, 2020).

CONCLUSION

A culture of food restriction is not a risk factor for stunting. A mother's height <150 cm has an 8.727 times greater risk of her child experiencing stunting than a mother's height of ≥ 150 cm. Birth weight <2500 g has a 13,750 times greater risk of stunting compared to a birth weight \geq of 2500 g.

CONCLUSIONS AND RECOMENDATIONS

Providing education to families with dietary restrictions to have positive thoughts about various types of nutritious and balanced food. To reduce the risk factors for stunting in babies who experience LBW and the mother's height is <150 cm to ensure good health and adequate nutrition during the first 1000 Days of Life (HPK), accompanied by efforts to prevent disease through immunization and a clean lifestyle as well as the need to increase breastfeeding exclusively without additional food and drink for infants up to six months of age, monitoring toddlers' weight development, and monitoring toddlers' nutritional status and nutritional intake.

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