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Analysis Of Factors Related to The Incidence of Stunting Toddlers in The Region Gambah Health Center

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ABSTRACT

Stunting is a condition of growth failure that occurs in toddlers. The 2022 SSGI survey results show that stunting in Indonesia is at 21.6%. Data from the South Kalimantan Provincial Health Office in 2022 indicates a rate of 24.6%. Data from the HSS Health Office in 2022 shows a rate of 4.53%. Among the 21 Health Centers in the HSS area, the Gambah Health Center ranks first with the highest stunting rate at 11.60%. Stunting is not caused by a single factor but by multiple factors. This research aims to analyze the factors associated with the incidence of stunting in toddlers in the Gambah Health Center working area in 2022. This study is a quantitative analysis using a case-control study method. The study employs chi-square tests and odds ratios. The sample consists of 120 toddlers, with 40 cases and 80 controls.The results of this study indicate that the factors associated with the incidence of stunting in toddlers are birth weight (p-value 0.022, OR 3.381), exclusive breastfeeding (p-value 0.000, OR 5.741), mother's education level (p-value 0.015, OR 5.444), history of pregnancy age (p-value 0.000, OR 9.736), and maternal nutritional status (p-value 0.006, OR 8.273).

The conclusion of this study is that factors associated with the incidence of stunting in toddlers in the Gambah Health Center working area in 2022 are birth weight, exclusive breastfeeding, mother's education level, history of gestational age, and maternal nutritional status during pregnancy.

Introduction

Stunting is a condition of impaired growth experienced by toddlers. This condition occurs due to inadequate nutritional intake or insufficient fulfillment of nutritional needs during the first 1,000 days of life, which spans from the fetal stage to when the child reaches two years old. Additionally, stunting can be caused by recurrent infections or a lack of stimulation

regarding nutritional intake. Stunting is a global nutritional issue and is more commonly found in developing countries. According to WHO data in 2017, approximately 22.2% or around 150.8 million toddlers worldwide were stunted. More than half of the global stunting cases, or 55%, originate from Asia, while over one-third (39%) occur in Africa (Kemenkes RI, 2020).

Based on the results of the 2022 Indonesian Nutrition Status Survey (SSGI), the prevalence of stunting in Indonesia was recorded at 21.6%. This figure shows a decline compared to the 2021 SSGI results, which reported a prevalence of 24.4%. However, stunting remains a significant issue in Indonesia as the prevalence rate still exceeds the WHO threshold of 20%. According to data from the South Kalimantan Provincial Health Office, the prevalence of stunting in South Kalimantan has also decreased. In 2021, the SSGI reported a prevalence rate of 30%, which dropped to 24.6% in 2022 (Kemenkes RI, 2022).

Based on data from the Hulu Sungai Selatan District Health Office, the prevalence of stunting in Hulu Sungai Selatan District, as recorded in the e-PPGBM system, was 5.37% in 2021 and decreased to 4.53% in 2022, reflecting a reduction of 0.84%. Similarly, data from the Gambah Health Center shows that in 2021, out of 415 toddlers, 43 were identified as stunted, resulting in a prevalence rate of 10.36%. In 2022, the number of stunted toddlers decreased to 40 out of 409, with a prevalence rate of 9.77%. This indicates a slight decline of 0.59% in stunting prevalence from 2021 to 2022.

The impact of stunting on children can manifest both in the short term and long term. The immediate effects include impaired brain development, reduced intelligence (IQ), and a weakened immune system, making children more susceptible to infections and illnesses. In the long term, stunting can lead to short stature, decreased productivity, higher healthcare costs, an increased risk of developing chronic diseases such as diabetes and cancer, and even premature death (Bagaswoto, 2020).

Stunting is not caused by a single factor but results from multiple interrelated factors. These include the absence of exclusive breastfeeding during the first six months of life, premature birth, low socioeconomic status in households, short birth length in infants, short maternal stature, low levels of maternal education, and poor family sanitation practices. Additionally, inadequate treatment of drinking water in families further increases the risk of stunting in children (Beal et al., 2018). Several factors contribute to the incidence of stunting, including maternal factors such as inadequate maternal nutrition during pregnancy, short maternal stature, and ineffective parenting practices, particularly in feeding behavior and child

nutrition management (Sukirno, 2019). Yanti, Betriana, and Kartika (2020) state that factors contributing to stunting during a child's golden age include parenting practices, maternal knowledge, economic status, low birth weight (LBW), and inadequate nutritional intake.

In 2022, the Hulu Sungai Selatan District Government organized a Stunting Roundtable and identified 25 village locations for specific and sensitive interventions. To address stunting, the district implemented various initiatives aimed at improving nutrition during the first 1,000 days of life (1,000 HPK). These include the Nutrition Awareness Movement to Support 1,000 HPK, providing supplementary food made from local ingredients through the BAAS program (Bapak Asuh Anak Stunting), nutritional recovery through the distribution of nutrition packages, training for officers and cadres on Infant and Young Child Feeding (IYCF), exclusive breastfeeding counseling, and cross-program and cross-sector coordination for stunting reduction. Other efforts include IYCF counseling, consolidation and convergence of cross-sectors and programs in stunting prevention, environmental health programs, and the provision of clean water and sanitation facilities and infrastructure (Dinas Kesehatan Kab.HSS, 2022).

According to the 2022 E-PPGBM data, Puskesmas Gambah ranks first among the 21 health centers in Hulu Sungai Selatan Regency, with a stunting prevalence rate of 11.60%. This shows that stunting in the Puskesmas Gambah work area is still quite high and government programs in preventing stunting have been pursued, especially local governments that work with related cross-sectors such as providing local-based supplementary food to forming a family companion program (TPK) where each stunting toddler will be given assistance by cadres and health workers for several periods which will be monitored regularly regarding the nutritional status of the stunting toddler. Based on preliminary studies, information was obtained that most of the stunted toddlers had mothers who were highly educated with a history of full-term pregnancy, the nutritional status of the mother during pregnancy was normal, the birth weight of 40 stunted toddlers was only found to be 6 people with LBW, and exclusive breastfeeding was still low and the source of drinking water used PDAM/ PamSIMAS where every house already had a toilet.

METHODE

This study is a quantitative analysis with a case-control design, conducted in the working area of the Gambah Health Center, Kandangan District, Hulu Sungai Selatan Regency. The study population consisted of 409 toddlers, of which 40 were identified as stunted and 369 were not stunted. The sampling technique used was systematic random sampling, where 40 stunted toddlers were selected as cases and 80 non-

stunted toddlers as controls. The study employed the chi-square and odds ratio tests for data analysis.

RESULTS AND DISCUSSION

This research was conducted at the Gambah Health Center area, Hulu Sungai Selatan Regency. Puskesmas Gambah is located on Jalan A. Yani Km 4 Gambah Luar Village, Kandangan Sub-district, Hulu Sungai Selatan Regency with the northern boundary bordering the working area of Puskesmas Angkinang, the east bordering the working area of Puskesmas Kandangan, the south bordering the working area of Puskesmas Kandangan, and the west bordering the working area of Puskesmas Kandangan. Puskesmas Gambah from the Puskesmas network in the village and Rukun Tetangga (RT) can be reached by land transportation. Administratively, Puskesmas Gambah covers 4 village areas, namely West Gambah Dalam Village, Gambah Dalam Village, Gambah Luar Muka Village, and Gambah Luar Village.

This study, titled "Analysis of Factors Associated with the Incidence of Stunting in Toddlers in the Gambah Health Center Working Area," was conducted in July 2023. It employed a case-control design with a systematic random sampling technique, and was carried out in the Gambah Health Center working area. The total sample size for this study was 120 participants, selected based on specific criteria. Of these, 80 mothers with children under five were included in the control group, while 40 mothers with stunted children were included in the case group.

Univariate Analysis

The first stage of data analysis is univariate analysis, which was performed to describe each variable through frequency distribution. The independent variables in this study included birth weight, exclusive breastfeeding, mother's education level, history of gestational age, and the nutritional status of the mother, while stunting served as the dependent variable.

Based on the research conducted in the Gambah Health Center area, the study results are presented as follows: Characteristics related to birth weight, exclusive breastfeeding, mother's education level, history of gestational age, and maternal nutritional status in the Gambah Health Center region.

Tabel 1. Frequency distribution of birth weight, exclusive breastfeeding, mother's education level, history of gestational age, nutritional status of mothers in the working area of the Gambah health center

No	Category	Total	Case		Control	
			n	%	n	%
1	Birth Weight					
	LBW	21	12	30	9	11,3
	Not LBW	99	28	70	71	88,8
	Total	120	40		80	
2	Exclusive breastfeeding					
	No	43	25	62,5	18	22,5
	Yes	77	15	37,5	62	77,5
	Total	120	40		80	

3	Mother's Education Level					
	Low	10	7	17,5	3	3,8
	High	110	33	82,5	77	96,3
	Total	120	40		80	
4	Gestatonal Age History					
	Premature	14	11	27,5	3	3,8
	Aterm	106	29	72,5	77	96,3
	Total	120	40		80	
5	Maternal Nutritional Status					
	Chronic energy deficiency	9	7	17,5	2	2,5
	Not chronic energy deficiency	111	33	82,5	78	97,5
	Total	120	40		80	

Bivariate Analysis

Bivariate analysis is used to examine the relationship between two variables. This analysis utilizes the chi-square test with a significance level of p-value <0.05 (95% Confidence Interval). If the p-value is less than 0.05, it is concluded that there is a significant relationship between the variables.

Table 2. Relationship between birth weight and the incidence of stunting among children under five years old

Birth Weight	Stunting				*p-value*	OR (CI=95 %)
	Yes		No			
	n	%	n	%		
LBW	12	30	9	11,3	0,022	3,381
No LBW	28	70	71	88,8		
Total	40	100	80	100		

Source: Processed Secondary Data 2022

Based on the results in Table 2 above, the chi-square test analysis yielded a p-value of 0.022 (<0.05) with an Odds Ratio (OR) value of 3.381. This indicates a significant relationship between birth weight and the incidence of stunting. With an OR value of 3.381, it can be concluded that toddlers with low birth weight are 3.381 times more likely to experience stunting.

Table 3. Relationship between mother's education level and the incidence of stunting among children under five years old

Education Level	Stunting				*p-value*	OR (CI=95%)
	Yes		No			
	n	%	n	%		
Low	7	17,5	3	3,8	0,015	5,444
High	33	82,5	77	96,3		
Total	40	100	80	100		

Source: Processed Secondary Data 2022

Based on the results in Table 3, the chi-square test analysis obtained a p-value of 0.000 (<0.05) with an Odds Ratio (OR) value of 5.741. This indicates a significant relationship between exclusive breastfeeding and the incidence of stunting. With an OR value of 5.741, it can be concluded that toddlers who do not receive exclusive breastfeeding have a 5.741 times higher risk of experiencing stunting.

Table 4. Relationship between gestational age history and the incidence of stunting among children under five years old

Gestational Age History	Stunting				*p-value*	OR (CI=95 %)
	Yes		No			
	n	%	n	%		
Premature	11	27,5	3	3,8	0,000	9,736
Aterm	29	72,5	77	96,3		
Total	40	100	80	100		

Source: Processed Secondary Data 2022

Based on the results in Table 4 above, it was found that one cell had an expected frequency of less than 5, so the Fisher Exact Test was used. The test yielded a p-value of 0.015 (<0.05) with an Odds Ratio (OR) value of 5.444. This indicates a significant relationship between maternal education level and the incidence of stunting. With an OR value of 5.444, it can be concluded that

mothers with low education levels have a 5.444 times higher risk of having stunted toddlers.

Table 5. Relationship between maternal nutritional status and the incidence of stunting among children under five years old

Maternal Nutritional Status	Stunting				*p-value*	OR (CI= 95%)
	Yes		No			
	n	%	n	%		
Chronic energy deficiency	7	17,5	2	2,5	0,006	8,273
Not chronic energy deficiency	33	82,5	78	97,5		
Total	40	100	80	100		

Source: Processed Secondary Data 2022

Based on the results in Table 5 above, it was found that one cell had an expected frequency of less than 5, so the Fisher Exact Test was applied. The test yielded a p-value of 0.000 (<0.05) with an Odds Ratio (OR) value of 9.736. This indicates a significant relationship between the history of gestational age and the incidence of stunting. With an OR value of 9.736, it can be concluded that toddlers born prematurely have a 9.736 times higher risk of experiencing stunting.

Based on the results of the study, which used 120 samples divided into two groups—40 samples from parents with stunted toddlers and 80 samples from parents with toddlers who are not stunted—the research was conducted in the Gambah Health Center region of Hulu Sungai Selatan Regency. The study found that stunting is not caused by a single factor, but by multiple factors, including birth weight, exclusive breastfeeding, maternal education level, gestational age history, and maternal nutritional status.

1. Birth Weight

Based on Table 2, the relationship between birth weight and the incidence of stunting in toddlers, the results of the bivariate analysis in this study indicated a significant association between birth weight and the occurrence of stunting, with a p-value of 0.022 and an Odds Ratio (OR) of 3.381. This finding aligns with research by Mila and Dyah (2022), which also found a significant relationship between birth weight and stunting, reporting a p-value of 0.007 and an OR of 4.080. However, a study by Anggreani, Zuhrotul Eka Yulis, et al. (2020) concluded that there was no significant relationship between birth weight and the incidence of stunting, as the p-value was 0.550. Birth weight is commonly linked to long-term growth and development. Low birth weight (LBW), defined as a baby born weighing less than 2500 grams, poses risks such as increased likelihood of death and impaired growth and development, including a greater risk of stunting if not managed appropriately (Tri Windiarto et al., 2018).

Newborn weight is a key indicator used to assess the health of a baby. Babies born with low birth weight are more vulnerable to various diseases and infections. Over time, low birth weight can lead to delays in the child's motor development. While babies with low birth weight can still grow up healthy, they may face certain health

challenges, such as slower weight gain, difficulty with the sucking reflex, and higher susceptibility to infections. The ideal weight for a baby born at full term, between 38-40 weeks of pregnancy, is typically between 2.7 and 4 kg, with an average length of 50-53 cm, depending on genetics. Births that deviate from this full-term range, either premature or post-term, often lead to health complications for the baby.

2. Exclusive breastfeeding

Based on the analysis of the relationship between exclusive breastfeeding and the incidence of stunting in toddlers, the bivariate analysis in this study revealed a significant relationship, with a p-value of 0.000 and an Odds Ratio (OR) of 5.741. This finding is consistent with the research of Barir et al. (2019), which also identified a significant relationship between exclusive breastfeeding and stunting in toddlers, with a p-value <0.001 and an OR of 0.22. However, a study by Ruswati et al. (2021) found no significant relationship between exclusive breastfeeding and the incidence of stunting, with a p-value of 0.603 (>0.05).

Breast milk is known for its excellent nutritional content, which is crucial for a baby's growth. Exclusive breastfeeding during the first six months of life provides the necessary nutrition to support the infant’s growth and development. Exclusive breastfeeding helps prevent diseases, supports brain and physical development, and enhances overall growth, particularly height. This is because breast milk contains calcium that is more efficiently absorbed by the baby compared to formula milk. According to Zomratun et al. (2018), breast milk significantly contributes to a child's growth and development, particularly in terms of height, as it ensures better calcium absorption, thus reducing the risk of stunting.

3. Mother's Education Level

Based on table 4, the relationship between maternal education level and the incidence of stunting in children under five years old, the results of bivariate analysis of maternal education level with the incidence of stunting in children under five years old obtained a p-value of 0.015 and an OR value of 5.444, which means that there is a significant relationship between maternal education level and the incidence of stunting in children under five years old. This finding is consistent with research conducted by Nurmalasari, Yesi, and Febriany (2020), which indicated a significant relationship between maternal education level and the incidence of stunting in children under five, with a p-value of 0.000 and an OR value of 3.313. In contrast, the study by Mila and Dyah (2022) did not show a significant relationship between maternal education and stunting, with a p-value of 0.064 (>0.05).

The level of maternal education plays a crucial indirect role in shaping a mother’s ability to understand health-related issues, particularly those related to nutrition. A mother with higher educational attainment

is more likely to be knowledgeable about nutritional health problems and can more effectively address them. This knowledge is integral because mothers are primarily responsible for managing their children's eating habits, including organizing the family's shopping, meal preparation, and food distribution. As highlighted by Noviyanti, Rachmawati, & Sutajo (2020), a mother's education significantly influences the health of the family, including the nutritional status of its members. Education also affects parenting styles, as mothers are the key caregivers and food managers, directly impacting their children's health and nutritional status. Thus, maternal education is a critical factor in promoting better health outcomes for children, especially in terms of preventing stunting.

4. Gestational Age History

Based on table 5, the relationship between the history of gestational age and the incidence of stunting in children under five years old, the results of bivariate analysis showed a p-value of 0.000 and an OR value of 9.736, which means that there is a significant relationship between the history of gestational age and the incidence of stunting in children under five years old. This study aligns with the findings of Ngainis (2020), which identified a significant relationship between the history of gestational age and the incidence of stunting in children under five, with a p-value of 0.000 and an OR value of 37.5. In contrast, the study by Hamzah, Haniarti, and Rini (2021) found no significant relationship, as indicated by a p-value of 0.303 (>0.05).

The typical gestational period for a healthy baby is between 37 and 40 weeks. If a baby is born prematurely (before 37 weeks), it is more likely to have a low birth weight (LBW). Premature babies face greater health risks because their organs are less developed, which increases the likelihood of long-term developmental and health complications. The earlier a baby is born, the more likely it is that the child will experience growth and developmental challenges.

This aligns with the World Health Organization's (WHO, 2018) findings, which state that a gestational age of less than 37 weeks can result in suboptimal fetal development. As a result, premature babies are at higher risk of being born with low birth weight (under 2500 grams), which can increase the likelihood of stunting and other health issues later in life.

5. Maternal Nutritional Status

Based on table 4 6, the relationship between maternal nutritional status and the incidence of toddler stunting, the results of bivariate analysis obtained a p-value of 0.006 and an OR value of 8.273, which means that there is a significant relationship between maternal nutritional status and the incidence of toddler stunting. In the opinion of the researchers, maternal nutritional status plays a crucial role in fetal development and child growth. Adequate

maternal nutrition during pregnancy ensures that the fetus receives sufficient nutrients to support proper growth and development. Malnutrition during pregnancy can lead to low birth weight, preterm birth, and stunted growth in infants. When the mother does not consume enough nutrients, such as protein, vitamins, and minerals, it can result in deficiencies that impair the development of the fetus, thus increasing the risk of stunting after birth. Maternal malnutrition can lead to undernutrition in children. Poor maternal nutrition can result in inadequate energy and nutrient supply to the fetus, leading to compromised birth outcomes, such as low birth weight, which is a known risk factor for stunting. Furthermore, maternal nutrition influences the quality of breast milk, which is essential for the growth and development of infants during the first few months of life.

This research is in line with Alfarisi, Ringgo, et al. (2019), who found a significant relationship between maternal nutritional status and the incidence of stunting in children under five. They reported a p-value of 0.005 and an OR value of 2.228. However, the study conducted by Elis Nurajizah (2022) did not find a significant relationship, as the p-value was 0.105 (>0.05).

Stunting often begins during fetal development, primarily due to the mother's insufficient nutrition during pregnancy. Inadequate maternal nutrition results in insufficient nourishment for the fetus, which can hinder growth and development, potentially leading to stunting after birth. If a pregnant woman has an upper arm circumference of less than 23.5 cm, it indicates insufficient energy and protein intake, which could lead to poor fetal growth. Early intervention by health workers, especially midwives and nutritionists, is crucial to address these nutritional deficiencies. Providing proper pregnancy care, adhering to health standards, and delivering health education can prevent complications like premature labor and low birth weight, both of which contribute to stunting.

This is supported by the theory proposed by Manggabarani et al. (2018), which states that the mother's nutritional history before and during pregnancy can significantly influence fetal growth and development. Therefore, maternal nutrition plays a critical role in preventing stunting, highlighting the need for early detection and intervention to ensure better outcomes for both mother and child.

CONCLUSION

Birth weight, exclusive breastfeeding, mother's education level, pregnancy age history, and maternal nutritional status are factors that can cause the incidence of stunting toddlers.

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