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Analysis Of Determinant Factors Influencing The Incidence Of Stunting In Toddlers

Murti Ani [1)] Krisdiana Wijayanti [2)] Kuswanto [3)] Aulia Fatmayanti [4)] Yanik Muyassaroh [5)]

E-mail: animurti89@gmail.com

ABSTRACT

Background: The incidence of poor linear growth or commonly known as stunting is one of the nutritional problems experienced by toddlers in the world today. The expected national stunting target in 2024 is 14%. The prevalence of stunting in 2022 in Blora Regency is 25.8%. This study aimed to analyze the determinant factors influencing of stunting in toddlers.
Methods: The research method uses case control predictive analytical research. The sample consisted of 140 toddlers selected by systematic random sampling. The sample in this study was divided into two, namely the case sample and the case sample control (70 toddlers in each group). The subsequent nutrient status assessment was performed using the calculation of longevity indicator by Age (PB/U) or Body Height by Age (TB/U) based on z-score according to WHO. Chi-square and multivariable logistic regression were used to analyze.
Results: Bivariate analysis showed that giving exclusive breastfeeding (p=0.000), the condition of the floor of the house (p=0.000), clean water sources (p=0.000), smoking family (p=0.000), family income (p=0.000), and meat/fish/egg consumption patterns everyday (p=0.000) have a significant relationship with the occurrence of stunting in toddlers. Meat/fish/egg consumption patterns everyday of toddlers was the most dominant risk factor, among the variables. The toddlers who never consume meat/fish/eggs every day had 4.410 times the risk of experiencing stunting (95% CI = 1.372-14.177).
Conclusion: Consumption of protein (meat/eggs/fish) every day is very necessary for toddlers to prevent risk factors for stunting.
Keyword: factor; stunting; toddler

[1]*Department of Midwifery, Poltekkes Kemenkes Semarang, Indonesia*
Jl. Tirto Agung Pedalangan Banyumanik, Semarang, Jawa Tengah, Indonesia

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Background. The incidence of poor linear growth or commonly known as stunting is one of the nutritional problems experienced by toddlers in the world today. As many as 165 million children under five worldwide are estimated to be affected by stunting (Prendergast & Humphrey, 2014). Based on the Indonesian nutritional status survey results, the stunting rate in Indonesia in 2022 is still high a 21.6% (Kemenkes, 2023)

Stunting is one of the targets of the Sustainable Development Goal (SDGs) which includes the 2nd sustainable development goal, namely eliminating hunger and all forms of malnutrition by 2030 and achieving food security. The generation that grows optimally, aka not stunting, has a better level of intelligence, which will provide good competitiveness in the field of development and the economy. Besides that, optimal growth can reduce the burden of risk of degenerative diseases as a residual journey that is carried from inside the womb (Archda, R. and Tumangger, 2019).

There is growing evidence of the connections between slow growth in height early in life and impaired health and educational and economic performance later in life. Recent research findings, including follow up of an intervention trial in Guatemala, indicate that stunting can have long term effects on cognitive development, school achievement, economic productivity in adulthood and maternal reproductive outcomes (Dewey & Begum, 2011). Stunting has a biological implicit on the development of the brain and nerves which translates into a decrease in cognitive values, and if no precautions are taken it can cause a child's brain development, body metabolism, and

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physical growth to be disrupted (Mintawati, 2022). Linear growth failure serves as a marker of multiple pathological disorders associated with increased morbidity and mortality, loss of physical growth potential, reduced neurodevelopmental and cognitive function and an elevated risk of chronic disease in adulthood (De Onis & Branca, 2016).

Stunted and severely stunted toddlers are toddlers with long bodies or height according to their age compared to WHO-MGRS standards (Multicenter Growth Reference Study 2006). While the definition of stunting according to the Ministry of Health is a child under five with a z-score value of less than -2 standard deviation (stunted) and less than -3SD (severely stunted) (Tobing et al., 2021).

Toddler nutritional status is measured based on age, weight and height/length. The variables of weight and height/weight of toddlers are presented in the form of three anthropometric indices, namely weight/age, height/age, and weight/height. To assess the nutritional status of toddlers, the weight and height figures for each toddler are canceled into a standardized value (Zscore) using standardized toddler anthropometry (Trihono, T., Atmarita, A., Tjandrarini, D. H., Irawati, A., Nurlinawati, I., Utami, N. H., & Tejayanti, 2015). Nutritional status indicators based on the height/age index provide indications of chronic nutritional problems as a result of long-lasting conditions. For example: poverty, unhealthy lifestyles, and insufficient food intake in the long term from infancy, even from the time of the fetus, causing the child to become short (Doloksaribu, 2022).

The factors that influence the incidence of stunting in developing countries are the relationship between the level of exclusive breastfeeding intake, the level of protein adequacy, and economic status, and hygiene and sanitation. The prevalence of stunting in developing countries is an average of 36.7%. With a prevalence in Indonesia 31.8%, Ethiopia 53.5%, and Mozambique 37% (Trihono, T., Atmarita, A., Tjandrarini, D. H., Irawati, A., Nurlinawati, I., Utami, N. H., & Tejayanti, 2015). Based on research, it is known child stunting is associated with the following determinants in Indonesia: male sex, premature birth, short birth length, nonexclusive breastfeeding for the first 6 months, short maternal height, low maternal education, low house-hold socio-economic status, living in a household with unimproved latrines and untreated drinking water, poor access to healthcare, and living in rural areas (Beal, Tumilowicz, Sutrisna, Izwardy, & Neufeld, 2018). Based on the results of other studies, it is known that several factors have a relationship with the incidence of stunting, such as parenting styles for children, basic immunization, basic sanitation, history of infectious diseases, smoking habits, and the incidence of respiratory infections (Ali Mashar et al., 2021).

The stunting rate in Central Java in 2022 is still below the national stunting rate (21.6%), which is 20.8%. However, there are several regencies or cities that have experienced an increase in the number of stunting. In addition, the expected national stunting target in 2024 is 14% (Kemenkes, 2023). Blora Regency is included in the 100 priority districts or cities for stunting child intervention (Tobing et al., 2021). The prevalence of stunting under five in 2022 in Blora Regency is 25.8%, ranking the fifth highest number of stunted under-fives in Central Java after Brebes, Temanggung, Magelang and Purbalingga Regencies (Kemenkes, 2023). Therefore, the problem of stunting in Blora Regency is a case that requires special attention.

Based on the results of research that has been done on the analysis of the determinants that influence the incidence of stunting, most of them are based on literature studies and only one locus. In this study, research will be conducted in several stunting locus villages in Blora Regency and the variables studied were food supply, family and environmental factors. By knowing the causes of stunting, especially

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in Blora Regency, it will be possible to provide appropriate interventions. This study aimed to analyze the determinant factors influencing of stunting in toddlers.

Methods. The research method uses case control predictive analytical research which was carried out in Blora District in November-December 2022. The population in this study were all toddlers in Blora Regency. The sample consisted of 140 toddlers, selected by systematic random sampling. The sample in this study was divided into two, namely the case sample and the case sample control (70 toddlers in each group). The variables in this study are divided into two, namely the independent variables consisting of exclusive breastfeeding, house floor, clean water souce, family income, smoking family, consumption pattern of meat/fish/eggs everyday, while the dependent variable studied was the incidence of stunting.

The following nutritional status assessment was performed using the calculation of the indicator of Body Length by Age (PB/U) or Body Height by Age (TB/U) based on z-score according to WHO. Stunting defined as a height-for-age Z score of less than -2 deviation standard. The chi-squared test was used to test the significance of associations, and multivariable logistic regression was used to find the dominant risk factor that causes stunting in children under five years.

Result and Discussion. Table 1 presents the distribution of characteristics respondents. Approximately 50.71% of mothers with a history of pregnancies did not have KEK, 50.71% of the history of the mother's pregnancy did not anemia, and 56.43% of the toddlers were not exclusive breastfeeding. 53.57% toddlers living with house floor with land, 60.71% clean water souce with boreholes. Almost all toddlers (54.29%) have a smoking family, 55.00% parents income below the average, and 47% of toddlers never consume meat/fish/eggs every day.

Table 1. Characteristic Of Respondents

Variables	n (140)	% (100)
Exclusive breastfeeding		
Yes	61	43.57
No	79	56.43
House floor		
Land	75	53.57
Floortile	65	46.43
Clean water source		
Boreholes	85	60.71
Local water company	55	39.29
Smoking family		
Yes	76	54.29
No	64	45.71
Family income		
<UMR	77	55.00
≥UMR	63	45.00
Consumption pattern of meat/fish/eggs		
Never	47	33.57
Sometimes	46	32.86
Often	47	33.57

Table 2. Bivariate Analysis For Risk Factors Of Stunting

Variables	Stunting				Total		p-value
	Yes		No				
	n	%	n	%	n	%	
Exclusive breastfeeding							.000
Yes	15	21.43	46	65.71	61	43.57	
No	55	78.57	24	34.29	79	56.43	
House floor							.000
Land	57	81.43	18	25.71	75	53.57	
Floortile	13	18.57	52	74.29	65	46.43	
Clean water source							.000
Boreholes	60	85.71	25	35.71	85	60.71	
Local water compan	10	14.29	45	64.29	55	39.29	
Smoking family							.000
Yes	64	91.43	12	17.14	76	54.29	
No	6	8.57	58	82.86	64	45.71	
Family income							.000
<UMR	62	88.57	15	21.43	77	55.00	
≥UMR	8	11.43	55	78.57	63	45.00	
Consumption pattern of meat/fish/eggs							.000
Never	40	57.14	7	10.00	47	33.57	
Sometimes	26	37.14	20	28.57	46	32.86	
Often	4	5.72	43	61.43	47	33.57	

Table 2 presents the proportion of stunted toddlers seemed to be associated with the exclusive breastfeeding (p=0.000), house floor (p=0.000), clean water souce (p=0.000), smoking family (p=0.000), family income (p=0.000), and consumption pattern of meat/fish/eggs every day (p=0.000).

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ASI (breast milk) is milk produced by the mother and contains the nutrients needed by the baby for the needs and development of the baby. Babies are only given breast milk, without additional liquids such as formula milk, orange juice, honey, tea, water and without additional solid foods such as bananas, papaya, milk porridge, biscuits, rice porridge and team, for 6 months (Mufdillah, 2017). In this study, many stunted toddlers were given partial breast milk, that is, in addition to breast milk, they were also given additional food and other drinks.

Based on the results of the data analysis test, it is show that the type of floor and water sources are related to stunting (Putri, Namira, & Syafiuddin, 2022); (Nisa, Lustiyati, & Fitriani, 2021). Unique sets of stunting determinants predicted stunting reduction within countries that have reduced stunting. Several common drivers emerge at the basic, underlying, and immediate levels, including sanitation conditions (Vaivada, T., Akseer, N., Akseer, S., Somaskandan, A., Stefopulos, M., & Bhutta, 2020).

Dug wells are water sources located in the soil layer which are relatively close to the ground surface. So dug wells are very easily contaminated through seepage, such as the use of the wells own water (water used for washing and bathing). In addition, dug wells have a higher risk of contamination, because they are open (Sabanari, Joseph, & Maddusa, 2017). Dug wells are considered not sufficient to meet health requirements compared to pumping/plumbing wells, pumping wells are safer because there is a well cover that can prevent contamination of the water.

The results of this study are in line with (Sari, 2017) research that there is a relationship between smoking and stunting. Smoking behaviour in parents especially father will affect the growth process of the child either directly or indirectly. The habit of consuming cigarettes will cause children to be exposed to harmful chemical substances harmful from smoking which will inhibit growth. The cost to buy cigarettes will also be reduce costs for fulfilling shopping needs in the household so that nutritional intake is the hope that it could be given well to children did not materialize properly (Novianti, 2020). The results of research by (Astuti, D.D., Handayani, T.W. and Astuti, 2020) showed that there is a relationship between the duration of smoking exposure and the incidence of stunting.

There is a relationship between family income with the incidence of stunting. Family income related household capacity meet the needs of life both primary, secondary, nor tertiary. High family income make it easier to meet the needs of life, conversely lower family income is more having difficulty meeting their needs life. Low income will affect the quality and quantity of materials food consumed by the family. Low levels of income and weak power buy makes it possible to overcome habits eat in certain ways precludes particularly effective nutritional repair for their children Food obtained usually will be less varied and few the amount is mainly in the working material for growing children a source of protein, vitamins, and minerals, thereby increasing the risk of being deficient nutrition. Such limitations will increase risk of family members experiencing stunting (Hapsari, W., & Ichsan, 2018).

Table 3. Multivariate Regression Analysis Of Risk Factors For Stunting

Variables	B	Wald	p-value	OR	95% CI	
					Lower	Upper
Exclusive breastfeeding	-1.190	.000	1.000	.304	.000	-
House floor	2.112	.000	1.000	8.262	.000	-
Clean water source	-18.558	.000	.999	.000	.000	-
Smoking family	21.727	.000	.999	272855 4491	.000	-
Family income	17.540	.000	.999	414672 65.32	.000	-
Consumption pattern of meat/fish/eggs everyday	1.484	.000	.013	4.410	1.372	14.177

Table 3 shows the multivariate analysis. Toddlers who never consume meat/fish/eggs every day had 4.410 times the risk of experiencing stunting (95% CI = 1.372-14.177). Stunted toddlers have lower protein intake than toddlers who are not stunted (Suri, Tano-Debrah, & Ghosh, 2014). Based on research (Wijayanti, Harwijayanti, & Ani, 2023), there was an increase in the average stunting toddler weight after the given chicken floss and catfish nuggets supplementary.

Conclusion and Suggestions. Giving exclusive breastfeeding (p=0.000), the condition of the floor of the house (p=0.000),

clean water sources (p=0.000), smoking family (p=0.000), family income (p=0.000), and meat/fish/egg consumption patterns everyday (p=0.000) have a significant relationship with the occurrence of stunting in toddlers. Meat/fish/egg consumption patterns everyday of toddlers was the most dominant risk factor, among the variables. The toddlers who never consume meat/fish/eggs every day had 4.410 times the risk of experiencing stunting (95% CI = 1.372-14.177).

Consumption of protein (meat/eggs/fish) every day is very necessary for toddlers to prevent risk factors for stunting.

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