



Identifying Predictors of Stunting in Children under Five Years in Southeast Sulawesi, Indonesia

Waode Sitti Asfiah Udu*¹, Ayikacantya Sudayasa², Fahika Adhiany Basir² and Zahwa Fatimah Rocky²

¹ Department of Pediatrics, Faculty of Medicine, Halu Oleo University, Kendari, Indonesia

² Medical Study Program, Faculty of Medicine, Haluoleo University, Kendari, Indonesia
yomi_asfiah@yahoo.co.id

Abstract. Stunting in children is a chronic nutritional problem caused by multi-factors. Children with stunting will have difficulty achieving optimal physical and cognitive development. The prevalence in Indonesia shows that 1 in 3 children suffers from stunting. This study aims to determine predictors of stunting in children under five years in Southeast Sulawesi, Indonesia. This research is an observational analytic with a cross-sectional approach involving 96 children under five years in Kendari City, Southeast Sulawesi, Indonesia. Characteristic data using a questionnaire while anthropometric data based on measurements of body length and height according to age based on WHO. Statistical test using Chi-square and multivariate logistic regression. The results indicated that birth length ($p = 0.000$; OR 7.174; 95% CI 4.638 – 297.956), birth weight ($p = 0.000$; OR 3.417; 95% CI 2.440 – 4.783), immunization status ($p = 0.008$; OR 3.147; 95% CI 1.339 – 7.397), mother's education ($p = 0.002$; OR 3.698; 95% CI 1.562 – 8.755) , mother's height ($p = 0.045$; OR 2.500; 95% CI 1.007 – 6.206) , father's height ($p = 0.034$; OR 2.469; 95% CI 1.060 – 5.751) and economic status ($p = 0.001$; OR 5.363; 95% CI 1.833 – 15.689) had a significant correlation with the incidence of stunting in children under five years. The multivariate test showed that economic status ($p = 0.036$; OR 4.160; 95% CI 1.095 – 15.797) was the most dominant risk factor for stunting. Social economy is the main factor that influences the incidence of stunting in children under five years. A multidisciplinary approach, especially in strengthening the family aspect, is needed to prevent stunting in children.

Keywords: Stunting, Social economy, Children.

1 Introduction

Malnutrition is a nutritional problem that is still a major concern for the government and society because its prevalence is still quite high in Indonesia. The condition of malnutrition among children under five in the Southeast Asia and Pacific region in 2014 was still quite high. Indonesia ranks second highest for the prevalence of malnutrition at 12.1% among 17 countries in the region [1]. The results of Basic Health Research in Indonesia in 2018 regarding the nutritional status of toddlers aged 0-59 months, showed

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K. J. Banda and S. Susanty (eds.), *Proceedings of the 1st International Conference Medical and Health Science Halu Oleo (IMHO 2023)*, Advances in Health Sciences Research 76,

https://doi.org/10.2991/978-94-6463-392-4_20

that the prevalence of severe malnutrition in Indonesia was 3.9%, malnutrition was 13.8%, while the prevalence of stunting in toddlers was 30.8% [2]. Even though the prevalence has decreased from 37.2% in 2013, the prevalence still shows that 1 in 3 Indonesian children experience malnutrition for a long time [3].

Stunting is a condition where children under five years has a length or height that is less than his age, with measurements of length or height that are more than minus two standard deviations from the median of WHO child growth standards. Stunting is a condition of failure to thrive in children under 5 years old due to chronic malnutrition, especially in the first 1.000 days of life, which can be seen from the length or height below the standard for children of their age. Stunting in children under five is a chronic nutritional problem caused by many factors such as socio-economics, maternal nutrition during pregnancy, pain in babies, and lack of nutritional intake in babies. Stunted toddlers will experience difficulties in achieving optimal physical and cognitive development [4]. Based on the Global Nutrition Report in 2018, Indonesia's stunting prevalence from 132 countries was ranked 108th, while in the Southeast Asia region, Indonesia's stunting prevalence was the second highest after Cambodia [5]. The prevalence of stunting has decreased from 2018 to 2019. Based on the 2019 Indonesian Toddler Nutrition Status Study (SSGBI), the prevalence of stunting in toddlers was 27.7% or decreased by 3.1%, from 30.8% in 2018. Decrease If converted into the number of children under five based on data from the Central Statistics Agency (BPS), there were 1.46 million children under five who were saved from stunting in 2019 [3].

Data from Southeast Sulawesi Province shows that stunting cases in children under five are 28.7%, while stunting cases in Kendari City are 26.65%, still quite high as the national percentage [6]. This study aims to identify risk factors for stunting in children under five years in Kendari city, Southeast Sulawesi.

2 Methods

This research is an analytical observational study using a cross sectional design involving 96 children aged under five years in Nambo sub-district, Kendari city, Southeast Sulawesi, Indonesia. Characteristic data was collected using a questionnaire while anthropometric data was collected through height measurements. Stunting measurement is based on the Height for Age index <-2 Standard Deviation [7].

Statistical analysis using Chi-square and multivariate logistic regression. This research has also received approval from the Health Research Ethics Committee, Faculty of Medicine, Halu Oleo University RefNumber: 192/UN29.17.1.3/ETIK/2021.

3 Results

A total of 96 children aged under five years in this study consisted of 55 (57.3%) girls and 41 (42.7%) boys with the general characteristics of the research subjects which can be seen in Table 1.

A total of 38 (39.6%) children aged under five years experienced stunting. There was a significant relationship between birth length, birth weight, immunization status,

mother's education, mother's height, father's height and economic status with the incidence of stunting in children under five years old in Kendari city ($p < 0.05$). The multivariate test showed that economic status ($p = 0.036$; OR 4.160; 95% CI 1.095 – 15.797) was the most dominant risk factor for stunting (see Table 2).

Table 1. General characteristics of research subjects

Characteristics		n	%
Gender	Boy	41	42.7
	Girl	55	57.3
birth length	Normal	80	83,3%
	Short	16	16,7%
birth weight	Normal	82	85,4%
	Low	14	14,6%
immunization status	complete	47	49,5%
	Incomplete	48	50,5%
mother's education	Low	40	41,7%
	high	56	58.3%
mother's height	Normal	69	71,9%
	Short	27	28,1%
father's height	Normal	58	60,4%
	Short	38	39,6%
economic status	Low	65	67,7%
	high	31	32,3%
nutritional status	Normal	58	60,4%
	Stunting	38	39,6%

Table 2. Bivariate and multivariate analysis of correlation between birth length, birth weight, immunization status, mother's education, mother's height, father's height and economic status with the incidence of stunting

		Stunting incidents		p	OR	95% CI	Sig. (p)		
		<i>Stunting</i>						<i>Not stunting</i>	
		n	%					n	%
birth length	Short	1	15.6	1	1%	0.00	7.17	4.63 – 297.95	
		5	%						
	Normal	2	24%	5	59.3				
		3		7	%				
birth weight	Low	1	14.6	0	0%	0.00	3.41	2.440 – 4.783	
		4	%						
	Normal	2	25%	5	60.4				
		4		8	%				

immunization status	Incomplete	2	25%	2	22%	0.00	3.14	1.339	
		5	25%	2	36%	8	7	–	
	Complete	2		3				7.397	
		5		6					
mother's education	Low	2	23.9	1	17.8	0.00	3.69	1.562	
	high	3	%	7	%	2	8	–	
		1	15.6	4	42.7			8.755	
		5	%	1	%				
mother's height	Short	1	15%	1	12%	0.04	2.50	1.007	
	Normal	5	23%	2	46%	5	0	–	
		2		4				6.206	
		3		6					
father's height	Short	2	15%	1	18%	0.03	2.46	1.060	
	Normal	0	23%	8	40%	4	9	–	
		1		4				5.751	
		8		0					
economic status	Low	3	34,4	3	33,3	0.00	5.36	1.833	0.03
	High	3	%	2	%	1	3	–	6
		5	5.2%	2	27.1			15.68	
				6	%			9	

4 Discussion

This research shows that the incidence of stunting in children under five was 39.6% of the 96 children under five studied in the city of Kendari. This shows that the percentage of stunting incidents is still quite high compared to the national stunting prevalence of 30.8% [6]. There is a significant relationship between birth length, birth weight, immunization status, mother's education, mother's height, father's height and economic status with the incidence of stunting in children under five years of age in Kendari city.

Stunting is a condition caused by many factors involved. Research conducted in Bangkalan also shows that there is a relationship between birth length and the incidence of stunting in children aged 12-59 months, while other research shows that toddlers with low birth length have a 1.56 times greater risk of becoming stunted than toddlers with low birth length. normal birth [8-9]. Research conducted on children aged 24-59 months in Padang City shows that there is a relationship between birth weight and the incidence of stunting. Other research also shows that children born with low birth weight have a 25 times risk of experiencing stunting compared to babies with normal birth weight [10-11]. Birth weight and birth length in children under five can influence the incidence of stunting because babies who experience growth faltering from an early age show a risk of experiencing growth faltering in the following age period so that they are unable to achieve optimal growth. Babies born with low body length and birth weight indicate a condition of malnutrition that has been experienced by the fetus during pregnancy.

Immunization is an effort to increase active immunity against a disease. Immunization aims to reduce morbidity, disability and death rates due to infectious diseases. This research shows that there is a relationship between immunization status and the incidence of stunting. Other research shows that children with incomplete immunization have a 1.78 higher risk of experiencing stunting compared to children with complete immunization status [12]. Health services through immunization prevent infections in children thereby reducing morbidity rates which can indirectly reduce the risk of stunting in children. Reduced nutritional intake during illness and the use of nutrition diverted to treat infections can have an impact on disrupting children's growth.

This research shows that maternal education is related to the incidence of stunting in children under five years. Research conducted on children aged 6-23 months in Banjarmasin, Indonesia showed that mothers with low education had a 5.1 times greater risk of having stunted children [13]. Maternal education has an important role in fulfilling children's nutrition. Maternal education is closely related to patterns of nurturing, love and upbringing of children which will later influence the child's health, for example the regulation of eating patterns, the quality and quantity of food which will have an impact on the child's nutritional adequacy. This research shows that father's height and mother's height have a significant relationship to the incidence of stunting in children under 5 years of age. Another study conducted on children aged 24-59 months in Yogyakarta, Indonesia also showed that short maternal height can influence the incidence of stunting, while research conducted in Semarang, Indonesia also showed a relationship between father's height and risk factors for stunting in children [14-15].

This research shows that economic status is the main factor related to the incidence of stunting in children under five years of age. Low economic status is considered to have a significant impact on the possibility of children becoming malnourished and stunted [16]. Families with good economic status will be able to obtain better public services such as education, health services, road access, and others so that this can influence the nutritional status of children. Apart from that, family purchasing power will increase so that family access to food will be better [17]. Previous research shows that food intake and health status are significantly related to stunting in children in Libya. Meanwhile, other research shows that parental employment also has a significant relationship to the incidence of stunting, where stunting often occurs in children whose fathers do not have a job. All of this is related to the family's economic status [18-19].

Stunting is a condition caused by many factors involved. Research conducted in Jember Regency, Indonesia shows that the cause of stunting in rural and urban areas is not just inequality in education levels as a single factor, but multi-factors such as family income, exclusive breastfeeding, timing of giving additional food to replace breast milk, and adequate levels of zinc and iron [20]. This is in line with research in the city of Surabaya which shows that there is a relationship between the birth length of toddlers, history of exclusive breastfeeding, family economic capacity, maternal education level and maternal nutritional knowledge on the incidence of stunting [21].

Stunting that is not handled properly will have short-term impacts in the form of increased incidence of morbidity and death as well as impaired cognitive, motor and

verbal development, while long-term impacts include sub-optimal body posture as an adult, less than optimal learning capacity, decreased reproductive health and increased risk. obesity and other diseases. In addition, stunting in early childhood can cause disturbances in Intelligence Quotient (IQ), psychomotor development, motor skills and neurosensory integration. Stunting is also related to mental capacity and performance at school, in both moderate to severe cases it often causes a decrease in work capacity in adulthood [2].

Efforts to prevent stunting are a national priority for the Indonesian government. Priority programs in preventing stunting include accelerating poverty reduction, improving public health and nutrition services, distributing quality education services, increasing access to decent housing and settlements, and improving the governance of basic services. Based on the results of research conducted by Prof. Dr. Damayanti Syarif in Bayumundu Village, that the success of preventing stunting is the consistency of nutrition monitoring activities carried out by cadres and village midwives at Integrated Service Posts (Posyandu). The Indonesian Government's program through the National Strategy for the Acceleration of Stunting Prevention 2018-2024, involving a multi-sector approach down to the regional level, is expected to be able to prevent and reduce the incidence of stunting in children in Indonesia [3, 22].

5 Conclusion

In this study, it was concluded that there was a significant relationship between birth length, birth weight, immunization status, mother's education, mother's height, father's height and economic status and the incidence of stunting in children under five years in Kendari city. Social economy is the main factor that influences the incidence of stunting in children under five years. A multidisciplinary approach, especially in strengthening the family aspect, is needed to prevent stunting in children.

References

1. Indonesian Ministry of Health. Guidelines for the Prevention and Management of Malnutrition in Toddlers, Ministry of Health of the Republic of Indonesia. Jakarta: Republic of Indonesia Ministry of Health; 2019.
2. Indonesian Ministry of Health. Indonesian Health Profile. Jakarta: Republic of Indonesia Ministry of Health; 2019.
3. Secretariat of the Vice President of the Republic of Indonesia. Report on the Achievements of the National Strategy for Accelerating the Prevention of Stunting for the 2018-2020 Period. Jakarta: Ministry of State Secretariat of the Republic of Indonesia; 2021.
4. Ministry of Health of the Republic of Indonesia. Situation of Short Toddlers (Stunting) in Indonesia. Data and Information Center, Indonesian Ministry of Health; 2018.
5. Global Nutritional Report. Shining a light to spur action on nutrition; 2018.
6. Indonesian Ministry of Health. 2018 RISKESDAS National Report. Ministry of Health of the Republic of Indonesia. Jakarta: Health Research and Development Agency; 2018.

7. Minister of Health of the Republic of Indonesia. Regulation of the Minister of Health of the Republic of Indonesia Number 2 of 2020 concerning Child Anthropometric Standards. Jakarta: Indonesian Minister of Health; 2020.
8. Divine RK. The Relationship between Family Income, Birth Weight and Birth Length with the Incidence of Stunting in Toddlers 24-59 Months in Bangkalan. *J Health Manag.* 2017;3(1):1-14.
9. Hidayati N. Birth weight and length increase the incidence of stunting. *Health Sci J.* 2021;14(1).
10. Setiawan E, Machmud R, Masrul. Factors Associated with the Incident of Stunting in Children Aged 24-59 Months in the Andalas Health Center Working Area, East Padang District, Padang City, 2018. *Andalas Health J.* 2018;7(2).
11. Nainggolan BG, Sitompul M. The relationship between low birth weight (LBW) and the incidence of stunting in children aged 1-3 years. *Nutrix J.* 2019;3(1).
12. Fajariyah R, Hidajah AN. Relationship between Immunization Status and Maternal Height with Stunting in Children 2-5 Years in Indonesia. *Period J Epidemiol.* 2020;8(1):89-96.
13. Rahayu A, Khairiyati L. Risk of maternal education on the incidence of stunting in children 6-23 months. *Nutr Food Res.* 2014;37(2):129-136.
14. Wijayanti I. Mother's work outside the home and short height of mother and father as risk factors for stunting in elementary school children in Pemalang Regency. Thesis. Undergraduate Nutrition Study Program, Muhammadiyah University, Semarang. Semarang; 2018.
15. Husna M. The Relationship between Maternal Height and the Incident of Stunting in Children Aged 24-59 Months in the Working Area of the Minggir Community Health Center, Sleman Regency, Yogyakarta. Thesis. Midwifery Study Program, Department of Midwifery, Health Polytechnic, Ministry of Health. Yogyakarta; 2017.
16. UNICEF. Improving child nutrition, the achievable imperative for global progress. New York: United Nations Children's Fund; 2013.
17. Bishwakarma R. Spatial Inequality in Children Nutrition in Nepal: Implications of Regional Context and Individual/Household Composition. 2011. Accessed from <http://hdl.handle.net/1903/11683>.
18. Taguri A, Betimal I, Mahmud SM, Ahmed AM, Goulet O, Galan P, Herchberg S. Risk factors for stunting among under five in Libya. *Public Health Nutr.* 2009;12(8):1141-1149.
19. Ramli A, Agho KE, Inder KJ, Bowe SJ, Jacobs J, Dibley MJ. Prevalence and risk factors for stunting and severe stunting among under-fives in North Maluku Province of Indonesia. *BMC Pediatr.* 2009;9-64. doi:10.1186/1471-2431-9-64.
20. Okky A, Farah N, Ninna R, Mury R. Factors that influence the incidence of stunting in children under five in rural and urban areas. *E-J Health Lit.* 2015;3(1):163-170.
21. Khoirun N, Siti RN. Factors Associated with Stunting in Toddlers. *Indonesian Nutr Media.* 2015;10(1):13-19.
22. Candarmaweni AY. Challenges of Stunting Prevention in New Adaptation Areas 'New Normal' Through Community Empowerment in Pandeglang Regency. *Indonesian Health Policy J.* 2020;9(3).

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