Analysis of Determinants Stunting Children under Five Years in South Sulawesi Province, 2007 and 2013

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Abstract

Stunting is a condition in which the body is short and very short to exceed the deficit -2SD below the median length or height. Stunting occurs due to the impact of chronic malnutrition and impaired long-term growth, which has resulted in damage to a child's development is irreversible. The purpose of this study was to determine the determinant factors associated with stunting in children under five in South Sulawesi in 2007 and 2013. This study is a quantitative using cross sectional study design with a total sample of 3086 children under five based on Basic Health Research 2007 and 1013 Toddler based on Basic Health Research 2013. The variables used were characteristic Toddlers (stunting, BW / A, age, sex, immunization), mother characteristics (age, education, height, occupation), family characteristics (number of children under five, the number of the members of households, sanitation, regions where living and economic status). Data were analyzed using chi square test (bivariate) and multiple logistic regression (multivariate). Multivariate analysis showed that in 2007 the main determinant of the nutritional status toddler Stunting is BW / A OR (95% CI) = 4.290 (3.576 to 5.146) Social economy high with OR (95% CI) = 0.661 (0.556 to 0.784). While Basic Health Research in 2013 is the main determinant of weight Toddlers have enough chances 0.341 = -1.077, B is negative with the incidence of stunting.

Keywords: stunting; toddlers; determinant.

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1. Introduction

Malnutrition can be found in every community. Nutritional insufficiency, including a lack of energy and protein are also some micronutrients in long term leads to stunting. Stunting (short) are the state of the body is short and very short to exceed the deficit -2SD below the median length or height [1]. Results Basic Health Research 2007 reported that the prevalence of stunting in children under five in Indonesia is still relatively high compared with the number in Asia, reaching 36.8%, with short toddlers (stunting) of 19.5% and a very short (severe stunting) is 17.3% [2].

While the short-national prevalence in 2013 was 37.2 percent, which means an increase compared to 2010 (35.6%) and 2007 (36.8%). Short prevalence of 37.2% consisted of 18.0 percent very short, and 19.2% short. In 2013 a very short prevalence showed a decrease, from 18.8% in 2007 and 18.5% in 2010. The prevalence of short increased from 18.0% in 2007 to 19.2% in 2013 [3]. This figure shows that Indonesia is still experiencing problems stunting is a serious one and must be fixed.

Stunting besides caused by malnutrition, are also affected by various determine factors. Mother's education level and income are factors that significantly affect the malnutrition [4]. Research conducted by [5] in North Maluku shows that the age of the child, gender of the child, the number of family meals per day, father's income and employment are risk factors for stunting. There are many factors that influence the occurrence stunting in toddlers both factors direct or indirect factor, in connection with the matter, the purpose of this study was to determine relationship between the characteristics of toddlers (BW / A, age, gender, immunization,) the characteristics of the mother (age, mother education, height, status of work), household characteristics (region of residence, family size, the number of toddlers, the quality of drinking water, Economic Status) with stunting in children under five, and the dominant factor occurrence stunting in South Sulawesi based on Basic Health Research data 2007 and 2013.

2. Materials and Method

The research design used is cross sectional study with a quantitative approach. This study uses secondary data that retrieves data from the Health Research (Basic Health Research) Ministry of Health of Republic of Indonesia in 2007 and 2013. The research site is in South Sulawesi Province. Stunting in children is the dependent variable, while independent variables are toddler characteristics (BW / A, age, gender, immunization) mother characteristics (age, mother education, height, working status) household characteristics (territory of residence, family size, the number of toddlers, the quality of drinking water, the economic status). The samples were all toddlers who were in South Sulawesi Province contained in the Basic Health Research 2007 and 2013 data but only has complete data in accordance with the variables that 2007 was toddlers 3086 and 2013 amounted to 1013 were studied. Secondary data were obtained from the Agency for Healthcare Research and development Ministry of Health. Data were analyzed using SPSS version 17. Analysis of data through three stages. First univariate analysis, to describe the incidence of Stunting in children under five, the characteristics of the toddlers (age, weight, gender, immunization status), mother characteristics (age, mother's occupation, mother's education, mother's body height) characteristics Family (territory, water quality, sanitation members of

the family, the number of children, social, economic) data distribution both independent and dependent variables. Second bivariate analyzes were performed using a 2x2 cross table between each independent variable and the dependent variable with the goal to count the value of the odds ratio (OR) is the relative risk of stunting group and the normal group. Significance chi square test used with significant value of $p < 0.05$. Third multivariate, using Multiple Logistic Regression Analysis, to determine stunting incidence risk factors in toddlers.

3. Results

3.1 Factors that an association with a historical incident Nutritional Status short (Stunting) children under five years of 2007 and 2013 in the South Sulawesi Province

Bivariate test results is presented in Table 1, shows there are 2 factors were significantly related to the incidence of stunting in South Sulawesi based Basic Health Research 2007 that the nutritional status of children under five by index weight for age (BW / A) (p = 0.000) and state of social economy (p = 0.000). The characteristic that has a value of $p < 0.25$ is the nutritional status of children based on the index BW / A, region of residence, gender toddler, socio-economic situation which will then be tested to determine the determinant factor multivariate sample characteristics associated with the incidence of stunting.

Table 1: Relationship between the characteristics of the sample with stunting Basic Health Research 2007 and 2013, South Sulawesi Province

variable	Incidence of Stunting				Total N (%)	P
	stunting		Normal			
	n	%	n	%		
characteristics of Respondents						
Nutritional status (BW / A)						
Less	461	67.3	224	32.7	685 (100)	0000
Good	769	32.0	1632	68.0	2401 (100)	
Gender						
Man	615	38.7	974	61.3	1589 (100)	0177
female	615	41.1	882	58.9	1497 (100)	
age Toddler						
0-23 months	333	38.9	523	61.1	856 (100)	0502
24-59 months	897	40.2	1333	59.8	2230 (100)	
immunization						
Incomplete	52	40.0	78	60.0	130 (100)	0973
Complete	1178	50.0	1178	50.0	2356 (100)	
characteristics of Capital						

age of mother						
						1,000
<18 years	1	33.3	2	66.7	3 (100)	**
≥ 18 years	1229	39.9	1854	60.1	3083 (100)	
Mother's body height						
<150 cm	396	39.5	607	60.5	1003 (100)	0767
≥ 150 cm	834	40.0	1249	60.0	2083 (100)	
Education						
Low	244	37.0	416	63.0	660 (100)	0087
High	986	40.6	1440	59.4	2426 (100)	
Work						
Does not work	1022	39.4	1574	60.6	2596 (100)	0201
Work	208	42.4	282	57.6	490 (100)	
Characteristics of Families						
Number of Toddlers						
A little	1184	39.7	1798	60.3	2982 (100)	0354
Many	46	44.2	58	55.8	104 (100)	
Territory housing						
City	323	41.9	447	58.1	770 (100)	0171
Village	907	39.2	1409	60.8	2316 (100)	
Number ART						
Small	542	40.7	789	59.3	1331 (100)	0393
Big	688	39.2	1067	60.8	1755 (100)	
Water quality						
Not eligible	135	37.5	225	62.5	360 (100)	0331
Eligible	1095	40.2	1631	59.8	2726 (100)	
Social Economy						
Low	853	37.0	1455	63.0	2308 (100)	0000
High	377	48.5	401	51.5	778 (100)	

* Pearson Chi-square or Fisher's exact test **

Factors associated with Basic Health Research in 2013 were the nutritional status of children under five based on index BW / A (p = 0.000), mother's occupation (p = 0.045), and the border line is the social economy of the family (p = 0.054).

Table 2: Relationship characteristics of the sample with stunting Basic Health Research 2013 South Sulawesi

variable	Incidence of Stunting				Total N (%)	p
	Stunting		**Normal**			
	n	**%**	**N**	**%**		
Characteristic of Respondents						
Nutritional status (BW / A)						
Less	21	16.8	104	83.2	125 (100)	0000
Good	332	37.4	556	62.6	888 (100)	
Gender						
Man	200	36.2	352	63.8	552 (100)	0321
female	153	33.2	308	66.8	461 (100)	
age Toddler						
0-23 months	166	36.9	284	63.1	450 (100)	0289
24-59 months	187	33.4	373	66.6	560 (100)	
immunization						
Incomplete	10	33.3	20	66.7	30 (100)	0860
Complete	343	34.9	640	65.1	983 (100)	
characteristics of Capital						
age of mother						0062
<18 years	3	14.3	18	85.7	21 (100)	**
≥ 18 years	350	35.3	642	64.7	992 (100)	
Height Mom						
<150 cm	93	33.6	184	66.4	277 (100)	0062
≥ 150 cm	260	35.3	476	64.7	736 (100)	
Education						
Low	208	36.4	363	63.6	571 (100)	0230
High	145	32.8	297	67.2	442 (100)	
Work						
Does not work	275	36.6	476	63.4	503 (100)	0045
Work	78	29.8	184	70.2	262 (100)	
characteristics of Families						
number of Toddlers						

						0155
a little	346	34.6	654	65.4	1000 (100)	
						**
Many	7	53.8	6	46.2	13 (100)	
Territory Housing						
City	142	32.4	296	67.6	338 (100)	0163
Village	211	36.7	364	63.3	575 (100)	
number ART						
Small	157	33.7	309	66.3	466 (100)	0476
Big	196	35.8	351	64.2	547 (100)	
Water quality						
Not eligible	23	37.7	38	62.3	61 (100)	0629
Qualify	330	34.7	622	65.3	952 (100)	
social Economy						
Low	192	37.7	317	62.3	509 (100)	0054
High	161	31.9	343	68.1	504 (100)	

* Pearson Chi-square or Fisher's exact test **

3.2. Determinants of Nutritional Status Short (Stunting) Children Under Five Years of 2007 and 2013 in the South Sulawesi Province

Table 3: Results of logistic regression test against stunting in South Sulawesi province in 2007

variable	B	Sig	Exp (B) -OR-	95% CI For Exp (B)
Nutritional status index of BW / A	1,456	0,000 [b]	4,290	3.576 to 5.146
social Economy	-0.416	0,000 [b]	0.661	0.556 to 0.784
constants	-0.440	0,000	.224	

b = significantly different (p <0.05)

Logistic regression analysis results in Table 3 show that the nutritional status of children under five by the index BW / A and the state of family's social economy significant (p <0.05) associated with the incidence of stunting toddlers in South Sulawesi Province. OR value for the nutritional status of children under five by the index BW / A is 4,290. This means malnutrition children under five are have a chance 4,290 times higher incidence of stunting than normal children.

Another factor that may contribute to the incidence of stunting of children under five are the socio-economic

situation of families with OR value is 0.661, though the power connection is weak, but significant in the incidence of stunting in children under five. Based on the above equation shows that the probability of children under five are underweight accompanied by economic circumstances are likely to have a stunting is 37.3%), the rest is another factor.

Table 4: Results of logistic regression test through stunting Basic Health Research 2013 South Sulawesi

variable	B	Sig	Exp (B) -OR-	95% CI For Exp (B)
Nutritional status index of BW / A	-1.077	0,000 [b]	0.341	0.208 to 0.557
social Economy	.230	0.094	1258	0.962 -1.646
Mother's Work	.263	0.099	1,301	0.952 to 1.779
age of mother	-1.231	0.051	0.292	0.085 to 1.006
number of Toddlers	-1062	0,072	0.346	0.109 to 1.101
constants	0.236	0.693	1,266	

b = significantly different (p <0.05)

Table 4 shows that a significant determinant factors related p <0.05 with the incidence of stunting by Basic Health Research in 2013 in the South Sulawesi Province is the nutritional status of children under five by the index BW / A with OR is 0.341. Value B (Natural logarithm) of 0.341 = -1.077. Therefore the value of B is negative, then the nutritional status of children under five had a negative correlation with the incidence of stunting of children under five. Another factor that potentially associated with the incidence of stunting among children under five Basic Health Research 2013 is social economy, mother work, mother age, and the number of children, but not significantly. Another factor that presumably are genetic factors but did not participate were analyzed in this study.

4. Discussion

Based on Basic Health Research 2013 in the South Sulawesi Province is the nutritional status of children under five by the index BW / A with OR is 0.341. Value B (Natural logarithm) of 0.341 = -1.077. Therefore the value of B is negative, then the nutritional status of children under five had a negative correlation with the incidence of stunting of children under five.

Growth Failure because by lack of nutrition caused lack of weight, the number of children under five found stunting based on Basic Health Research 2007 and 2013 were the nutritional status of BBW / A is the nutritional status of children has a negative correlation that means precisely on good nutritional status that relate to the incidence of stunting and has a big opportunity occurs stunting. This is because stunting is a result of long term or chronic malnutrition, while the weight gain that can happen quickly, especially if in the added less body height then the fulfillment of body mass would be quickly met so that if we measure anthropometric BBW / A it

would be entered in the category of Good Nutritional Status, BBW / A illustrates the present situation as an out come today. While Stunting or TB / A is a state of the past because of an accumulation of nutritional status since birth until now or until the research carried out. Stunting began in 1000 days of born means since conception, during pregnancy if the nutritional intake of the mother is not sufficient then the child will be born experience stunting then will be compounded if parenting and diet of children in the first two years the is not good quality then the child will suffer permanent stunting, [6] based on an analysis of the possibilities so it could have been at the time of data collection when the toddlers weight enough, but he has suffer stunting since born so BBW / A good is not the cause stunting, therefore even though at the time of data collection is done Basic Health Research recorded that the well-nutrition children may be at the time of previous-time the child is already experiencing improvements in nutrition BBW / A but has not been able to keep pace in the body high growth aspect. Because of growth is another factor in a long time that affects until a child becomes stunted. So if the weight is less acute wasting and less body height or short (stunting) are chronic.

Income needed to meet the nutritional needs of children, if the family is able to provide the food needed for growth and development, the nutritional status of the children would be good, otherwise the house hold whose income or economic status is low, then the fulfillment of nutritious foods is not adequate for the child, so that the nutritional status toddler becomes low. Low incomes lead to low purchasing power too so with such revenues people cannot afford to buy food in the quantities required and ultimately adversely impact the nutritional status of children, food consumption will be more diverse if income increases revenue increase will increase the diversity of food consumption in the home. In the conditions where an increase in consumer income will spent money on food with a presentation that is getting smaller [7]. Toddlers who come from families with low economic status suffer stunting more than families who came from a high economic status. But the statistical test results of Basic Health Research in 2007 data shows that there is a relationship between family economic status is high (48.5%) and the incidence stunting, this study signify the most significant relationship to the family precisely the high economic status and potentially OR = 0,66 (0.556-0.784) this is caused due to low economic status is not the only risk factor for stunting, many factors contribute to the incidence of stunting, because there is no data that shows when the economic status of the family of children started to increase, while stunting is a manifestation failure to grow in the long period. Despite the high social status, but if it is not followed by pregnancy care, good parenting and health services, the toddler growth quality will be hampered. These results are not in line with or different from the results of research interest (2013) which states there is a significant correlation between the economic status of families with stunting namely (p <0.05), in 2007 and 2010.

Basic Health Research south Sulawesi province in 2013 data showed a significant relationship between economic status with stunting incidence p = 0.054, OR = 1.528 (0.962 -1.646). These results are consistent with research Strong (2013) showed that economic status is a risk factor of stunting incidence in children aged 2-3 years in East Semarang arena have restrictiveness in meeting the needs of family members of nutritious foods.

The role of mother is very important in maintaining the nutritional status of children. [8]. One reason for working moms is to help the family economy in order to provide for the family, especially the need to provide nutritious food for family members. Results Basic Health Research data in 2013 showed that mothers who did

not have a relationship with the incidence of children under short or stunting 36.6% p = 0.045 OR = 1.30 (0.952 to 1.779), although mothers who are not working but not a potentially significant Stunting, it is not in line with the research by [9] which states that a mother who does not work is not a risk factor. With the status of mothers who did not work while family income too low then the family will have difficulty in meeting the needs of families especially in providing family nutritious food, if compliance with nutrient does not run well in a long time, namely since the pregnant mother, the baby in the womb potentially experiencing incidence of stunting, a condition exacerbated if then not followed by efforts to improve nutrition of children in the first 2 years, children under five will experience a short events or stunting.

A large number of children under five in the family will affect the food security of the family. The large number of children under five will cause the level of needs including food needs to be higher. Income within a family will affect ability of the mothers in meeting the family nutrients needs with maximal results, research Basic Health Research 2013 are potentially related to the number of children in families with p = OR = 0.35 (0.109 to 1.101) this in line with the study by [10] which states that the number of children> 2 is a risk factor stunting 24-36 months. The number of children a great cause mothers cannot focus parenting on a child under five, so that the mother's attention should be divided properly, if it cannot be met, then less parenting quality could also cause children suspectible to disease infection and ultimately a risk of nutritional problems in that children. Number of household members is a dominant factor related to the occurrence of stunting, this is because families need more capabilities in order to provide food in large quantities for the large number of family member by [11,12] and this will be compounded if the family has low economic status.

The same determinant factor for stunting in 2007 appeared in 2013 is the toddler nutritional status BBW / A can be caused by BBW / A is an acute nutritional problems while stunting is a chronic nutritional problems.

5. Conclusion

The results of multivariate analysis showed that in 2007, the main determinant of the nutritional status toddler Stunting is BW / A OR (95% CI) = 4.290 (3.576 to 5.146) and Social economy high with OR (95% CI) = 0.661 (from 0.556 to 0.784), While Basic Health Research in 2013 is the main determinant of weight toddlers have enough chances 0.341 = -1.077, B is negative with the incidence of stunting.

Acknowledgement

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