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Multilevel Analysis of Determinants of Stunting Incidence in Children Under 5 Years in Malaka Regency, East Nusa Tenggara

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Abstract

Stunting is still a global nutritional problem. Stunting is a picture of the occurrence of chronic nutritional problems. Stunting caused by multiple factors, especially if it occurs in the first 1000 days of birth. Malaka Regency is one of the regions in NTT that recorded an increase in the percentage of stunting, from the previous 25% to 30% with the number of children experiencing stunting in Malaka currently reaching 4,909 people. With this number, Malaka is in 11th place with stunting in NTT (Malaka District Health Office, 2020). The purpose of the study was to determine the determinants of stunting in children under five in Malaka Regency. This study was an observational analytic study. The approach was case-control and used a multilevel model which is one of the analytical techniques to determine the correlation between various variables in health with the Stata-13 program. The sampling technique used in this study was stratified random sampling. The method used at the first level was to randomly select 10 villages in the district of Malaka, and at the second level to randomly select 25 integrated health care (IHC). Eight subjects will be taken from each integrated service post so that the sample was 200 subjects. The data was collected using a questionnaire and height measurement using a microtoise measuring instrument. The results of this study indicated that the factors causing stunting are exclusive breastfeeding (55.5%), Basic Sanitation (61.5%), Parenting (67.5%), and early marriage (32.0%). The results of this study indicated that the causes of stunting based on these variables had a significant difference ($p < 0.05$). The results of this study showed that parenting, basic sanitation and early marriage were factors that play an important role in the incidence of stunting in Malaka Regency. There were three main factors that cause stunting in Malacca Regency, namely parenting, basic sanitation and early marriage. For health workers to conduct socialization and counseling about exclusive breastfeeding, the importance of hygiene practices in daily life including caring for children, maximizing the community-based total sanitation program, and conducting socialization related to the influence of early marriage.

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INTRODUCTION

Stunting is a condition of children who fail to achieve linear growth potential so that their height is less than the height of children their age caused by chronic nutrient intake malnutrition and or chronic or recurrent infectious diseases (WHO, 2012). Another understanding, Stunting is the result of chronic malnutrition, often occurs between generations coupled with frequent or recurring diseases. Stunting is associated with lower cognitive development and productivity (Dewey & Begum, 2011).

Short and very short are nutritional statuses based on the Body Length Index for Age (body length /age) or Height for Age (height/age) which is the equivalent of the terms stunting (short) and severe stunting (very short). A child is categorized as very short if the body length according to age or height according to age is < -3 SD, and is said to be short if it is between -3 SD to < -2 SD (Kemenkes RI, 2011). In general, children's nutritional problems are the impact of an imbalance between nutrient intake and output (nutritional imbalance), namely intake that exceeds output or vice versa, in addition to errors in choosing food ingredients to eat (Onis & Branca, 2016).

Various problems that can be caused by children who are stunted and other nutritional deficiencies include reducing the possibility of survival, inhibiting optimal health, growth and development. Especially in brain development related to cognitive abilities so that it provides long-term effects that will affect the child's life. Lack of cognitive ability, easily disturbed health, declining school performance and low income are some of the impacts that can occur, so that sooner or later it will affect the development and development of a nation (UNICEF, 2013).

A study with the research design of the South East Asian Nutrition Survey (SEANUTS). showed that the nutritional status of stunting and other forms of malnutrition in Southeast Asia (Indonesia, Malaysia, Thailand, and Vietnam), significantly increased the likelihood of children having a non-verbal IQ <89. (Sandjaja, et al., 2013). Studies conducted in western China have also shown the effect of prenatal (low birth weight) and post-natal (stunting and low birth weight) malnutrition on intellectual functioning of early childhood. (Li, et al., 2016)

METHOD

This study was an observational analytic. Approach conducted case-control and use of the multilevel model is One analytical technique to determine the correlation between the various variables in the health of the program Stata-13. This study had been done with a simple random sampling technique. The sample selection through the division of the population into strata and samples selected randomly in each stratum (Murti, 2018). The method used at the first level was to randomly select 10 villages in the district of Malaka, and the second level was to randomly select 25 integrated service posts. Eight subjects were taken from each integrated service post so that the sample was 200 subjects. This study used a research instrument that had been tested for validity and reliability. Each variable (exclusive breastfeeding, parenting, basic sanitation and early-age marriage) consisted of 20 questions with correct and incorrect answer choices. Measurement of height used a microtoise measuring instrument.

RESULT

Table 1: Frequency distribution of subjects

No	Variable	Frequency	%
1	Stunting		
	-2SD (Not stunting)	144	72.0
	< -2SD (Stunting)	56	28.0
2	Exclusive breastfeeding		
	Not Exclusive	89	44.5
	Exclusive	111	55.5
3	Parenting		
	< mean (Less)	65	32.5
	mean (Good)	135	67.5
4	Basic Sanitation		

	< mean (Less)	77	38.5
	mean (Good)	123	61.5
5	Early-age marriage		
	≥ 18 years	136	68.0
	< 18 years	64	32.0

Souce: Primary Data

Table 1 shows stunting with exclusive breastfeeding by 55.5% (111 subjects), parenting by 67.5% (135 subjects), households with good sanitation 61.5% (123 subjects), and early marriage by 68.0% (136 subjects).

Table 2: Chi-square test of stunting variable

	Stunting					CI 95%		
Variable Group	No		Yes		OR	Upper	Lower	P value
	N	%	N	%				
Exclusive Breastfeeding								
Not Exclusive	47	52.8	42	47.2	0.16	0.08	0.32	<0,001
Exclusive	97	87.4	14	12.6				
Parenting								
Not enough	28	43.1	37	56.9	0.12	0.06	0.24	<0,001
Well	116	85.9	19	14.1				
Basic sanitation								
Not enough	36	46.8	41	53.2	0.12	0.06	0.24	<0,001
Well	108	87.8	15	12.2				
Early-age marriage								
≥18 years old	114	83.8	22	16.2	5.87	3.00	11.4	<0,001
<18 years old	30	46.9	34	53.1				

1. There is an effect of exclusive breastfeeding with the incidence of stunting in children under five. Exclusively breastfed children were not statistically significant to the risk of stunting (OR= 0.16; 95% CI= 0.08 to 0.32; p=<0,001).
2. There is a parenting with the incidence of stunting in children under five. Good maternal parenting was statistically significant as a protective factor against the risk of stunting with a strong influence (OR= 0.12; 95% CI= 0.06 to 0.24; p <0.001).
3. There is the influence of basic sanitation with the incidence of stunting in baduta. Households with basic sanitation both statistically significant protective factor / protection against the risk of the incidence of stunting with the power of a strong influence (OR= 0.16; 95% CI= 0.08 to 0.32; p=<0,001).
4. Early marriage there is impact with the incidence of stunting. Be statistically significant protective factor / protection against the risk of the incidence of stunting with the power of a strong influence (OR = 5.87; CI 95% = 3.00 to 11.4; p = <0.001).

Tabel 3. The result of Multilevel Analysis

Fixed effect	**b**	**CI**		**p**
		Lower	**Upper**	
Exclusive breastfeeding	-1.32	-2.13	-0.50	0.002
Parenting	-1.54	-2.36	-0.72	0.000
Basic Sanitation	-.32	-2.13	-0.51	0.001
Early-age marriage	1.39	0.57	2.20	0.001
Random effect				
Health center				
N Observation 200				
N Group = 25				
N Average = 8				

Log likelihood = -77.04(not concave)				

The variables that are considered most affect the growth of children under five years old at the model level 1, includes the main direct variable for the provision of exclusive breastfeeding, parenting, sanitation and early marriage. Analysis Model resumed at level 2, which in addition includes the model at level 1 is health center.

DISCUSSION

This study shows there are four variables that have a direct effect on the incidence of stunting in children under two years covering exclusive breastfeeding, parenting, basic sanitation and early marriage.

Exclusive Breastfeeding

These results indicate a significantly exclusive breastfeeding has a direct impact of stunting. Exclusive breastfeeding will reduce stunting in children under five by 1.32 unit (b -1.32, CI 95 % -2.13—0.50, p: 0.002). This study is in line with research of Rosita (2015), stating there was statistically significant correlation between exclusive breastfeeding with the incidence of stunting . Infants under 6 months of age are exclusively breastfed longer and heavier, are less likely to experience stunting compared to infants who are not exclusively breastfed (Kuchenbecker, et al , 2015). Toddlers who are exclusively breastfed 5.47 times more likely not to experience stunting compared to children who are not exclusively breastfed (Rosita, 2015).

Promotion of exclusive breastfeeding for a period of 6 months and continuous breastfeeding along with complementary feeding for 24 months, as outlined in the UNICEF programming guide, are important in preventing stunting among young children (Keino et al , 2014). Therefore, it has become a necessity for a mother to know the importance of breastfeeding and proper complementary feeding, as well as the need for proper hygienic practices during child care (Keino et al, 2014).

Parenting

These results indicate significant influence of parenting style has a direct impact on the incidence of stunting. Parenting will reduce stunting in children under five -1.32 unit (b -1.54, CI 95 % -2.36—0.72, p: 0.000). Upbringing of children is manifested in several ways such as breastfeeding and complementary feeding, psychosocial stimulation, practice cleanliness / hygiene and environmental sanitation, child care in the form of ill health practice at home and search patterns of health services. Habits that are in the form of family feeding practices, hygiene practices, psychosocial stimulation, health care utilization and environmental sanitation has a significant correlation with the occurrence of stunting children aged 24-59 months (Bella et al., 2020).

Likewise, research that has been carried out in the working area of the Lamper Tengan Health Center, Semarang City, shows that the determination of parenting patterns for parents with stunting shows that the nutritional status of toddlers is mostly not stunted. This is because the role of parents as implementers of parenting has gone very well in carrying out the practice of feeding, psychosocial stimulation and utilization of health services. On the other hand, poor parenting by producing stunting nutritional status can be caused by internal factors such as parental genetic factors which can indirectly affect the nutritional status of toddlers.

Sanitation

The results showed the direct and indirect influence between basic sanitation on the risk of stunting. Basic sanitation will reduce stunting in children under five -.32 unit (b, CI 95 % -2.13-0.51 p : 0.001). Households that have either direct basic sanitation can reduce the risk of stunting. Basic sanitation also indirectly affects the incidence of stunting through maternal hygiene practices and diarrheal diseases. This study is also relevant to the study of Solomon, et al., (2018) in North Sudan, said the risk of stunting is higher among children living in the household sanitation worse.

Globally, it is recommended that community-based interventions such as improving clean water, sanitation and hygiene, and to protect children from diarrheal diseases and malaria, intestinal helminths and environmental causes of subclinical infections become an integral part of a comprehensive framework for action to promote linear growth in children. children and reduce stunting (WHO, 2014). The results of this study indicate that there is a direct effect of basic sanitation on the incidence of stunting. As far as the search has been carried out, researchers have not found the mechanism for the occurrence of this direct effect, so further

research is needed to dig deeper into the direct effect of basic sanitation on the incidence of stunting.

Early-age marriage

The results of this study showed statistically significant early marriage has a direct impact on the incidence of stunting. Early marriage will reduce stunting in children under five 1.39 unit (b 1.39, CI 95 % 0.57—2.20, p : 0.001). Research is showing a mean age of a mother when she married early at 15.9 years, which according to the Law No. 23 Year 2002 on Protection of Children, the average age that is still less than 18 years, so included in the group aged children. According to UNICEF, there are several factors that influence the incidence of marriage early, namely poverty, perceptions that the marriage can protect children of women, the name of a good family, norms of social, legal religion that allows the practice of early marriage, and the legal system governing marriage is not strong.

Maternal age should not be too young and not too old. Age less than 20 years old or over 35 years, are at high risk for giving birth. Manuaba noted that pregnancy under the age of 20 years will be at risk for anemia, impaired fetal development, miscarriage, prematurity or low birth weight, birth disorders, preeclampsia, antepartum hemorrhage. This is in line with research conducted Indrasari stating that women with risk age (less than 20 years) had a 4.2 times greater risk for low birth weight occurred (LBW) than mothers who do not have the risk of age. Pregnancies in her early teens, when the mother is also still growing will increase the risk of the baby will be stunted.

Integrated Healthcare Center (IHC)

IHC has a strong contextual effect on stunting, where integrated service post has activities that support increased public health degree, which facilitates monitoring of growth and development of infants who are held monthly affect the nutritional intake during pregnancy (Indriani et al., 2018); (Sajalia et al., 2018).

IHC was held as an activity of, by and for the community, intended as an effort to empower communities to help themselves in achieving health level as high. Integrated service post revitalization is successful if it can restore its primary function as an institution of society, especially rural communities to monitor the growth of children. Education and training activities in mothers how to weigh and record the weight in KMS growth of children and can interpret KMS well, is the key to the success of the revitalization of Integrated service post.

CONCLUSION

This study concludes that there are several factors that cause stunting in children under five years old including: level 1 shows that there is a variable influence, namely exclusive breastfeeding, parenting, sanitation and early marriage. The growth model for children under five years at level 2 includes the influence of integrated service post variables.

SUGGESTION

Recommendations from this study are expected for policy makers both in health services to carry out socialization and counseling about exclusive breastfeeding, parenting, sanitation and delaying marriage at an early age.

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CONFLICTS OF INTEREST

This study used funding sources from research grants to novice lecturers so that conflicts of interest that will affect the researchers' decisions will not occur. The author declares that there are no conflicts of interest with the topic or any associated objects upon the publication of this study.

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