The External Factors Associated with Stunting Occurrence among 12 – 59 Months Old Toddler

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The External Factors Associated with Stunting Occurrence among 12 – 59 Months Old Toddler

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Abstract: Background: *Intervention strategy employed in solving stunting cases should be comprehensive by focusing on both direct (internal) and indirect factors (external). Therefore, the purpose of this study was to observe the indirect factors influencing the occurrence of stunting in toddlers.*

Methods: *The study design used was community-based case control with the population comprising of toddlers between 12-59 months old. The sample size included 49 cases and 98 controls, and the stunting was measured by using anthropometry. Furthermore, short toddlers were indicated by nutrition status which was determined by the ideal height in certain age and .compared with the provision of WHO-MGRS (Multicentre Growth Reference Study) that any toddler with z-score less than -2 SD is short and less than -3 SD is categorized as very short.*

Results: *The multivariate analysis conducted proved that toddlers with inadequate child-rearing have a greater risk (Adjusted Odds Ratio (AOR) = 3.03 (95% CI: 1.15-7.98) of experiencing stunting compared to those raised adequately. Those living in families below Guaranteed Minimum Income (GMI) has a greater risk (AOR = 4.63 (95 % CI: 1.701-12.63) of stunting compared to those in families with above Guaranteed Minimum Income (GMI). It was also found that those without exclusive breastfeeding has a greater risk (AOR = 4.53 (95 % CI: 1.64-12.49) compared to those with exclusive breastfeeding.*

Conclusion: *The intervention methods needed to improve stunting's problem-solving in rural areas include giving adequate child-rearing, improving the economic status of the family, and parent's knowledge about giving exclusive breastfeeding for 6 months.*

Keywords: stunting, toddler, rural, breastfeeding

I. INTRODUCTION

Stunting is a chronic nutrition problem which is directly caused by the deficiency of macronutrients and micronutrients over a long period. [1] Epidemiologically, a health problem occurs because of the imbalance between the host, agent, and the environment, therefore, public health issues like stunting could be attributed to the nutrition deficiency in a host [2] as well as external factors such as access to healthcare service, child-rearing, social economy, poverty, and environment.[6,7]

According to the Baseline Health Research of 2013, the prevalence of stunted toddlers in Indonesia reached 37,2%, with very short toddlers being 18% and short toddlers 19,2. [3] However, the World Health Organisation (WHO) considers an area to be ideal if the population of the short toddler present there is less than 20%.[4]

From the survey conducted by the Nutritional Status Monitoring in 2017, the prevalence of stunting was found to be 29,6% while Nutritional Status Assessment Data in South Sumatera recorded 22,8%. Out of the 17 Districts in South Sumatera, three districts including Musi Rawas Utara, Banyuasin with 32,8% and Ogan Ilir with 29,5% were found to have the highest prevalence. [5] Therefore, the reduction of the prevalence of short toddlers is one of the prioritized programs in national development from 2015-2019.

This disease affects the future of a child by leading to various defects such as low intelligence and cognitive ability which would later cause low productivity. Hunt (2005) reported that adult with stunting has lower productivity and income compared to those without. [8] Therefore, the aim of this study was to analyze the external factors associated with the occurrence of stunting among 12-59 months old toddlers. The prevalence in Indonesia, as a developing country, is closely related to the population's economic status, access to healthcare intervention, child-rearing, and environmental factor.

II. METHODS

A. Study Design and Sampling

The study design used was a community-based case control. The case group consisted of 12-59 months old toddlers with stunting while the control group was made of those without stunting. The information for toddlers with and without stunting was obtained from the Nutritional Status Assessment survey data of 2017 for 147 toddlers.

Stunting was measured by using anthropometry and short toddlers were indicated by nutrition status which was determined by the ideal height in certain age and compared with the provision of WHO-MGRS (Multicentre Growth Reference Study) that any toddler with z-score less than -2 SD is short and less than -3 SD is categorized as very short. [9]

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Enumerators for anthropometry included people with backgrounds in public health and nutrition, who also received proper training before the conduct of the study. The case group consisted of 49 toddlers while the control group was made of 98 toddlers selected through the use of simple random sampling. Control group were neighbors of case group's toddlers and picked by an unmatching method.

B. Statistical Analysis

The analysis started with data completion check by editing, coding, and entry. The refined was further analyzed by using the univariate, bivariate and multivariate methods. Univariate analysis was conducted to describe the frequency and distribution of each variable while bivariate analysis described the association of each independent variables to the dependent variable (stunting) which was divided into two categories based on WHO-MGRS (Multicentre Growth Reference Study) standard, stunted and not stunted. Statistic test used in the bivariate analysis was chi-square test while the multivariate analysis made use of multiple logistic regressions test.

C. Ethical Review

Ethical review for this study was conducted in the Faculty of Public Health, Sriwijaya University.

III. Results

The proportion of mothers with stunted toddler who have low education level was 20.4%, while those without but with low education level was 48%. The average age of mothers in case and control groups was found to be 32 years old while the stunted toddlers (case) were observed to be 26 months, and those without stunting (control) to be 32 months as shown in Table 1. Toddlers with inadequate child-rearing in the family have a probability 3.03 times greater to become stunted compared to those with adequate child-rearing (Adjusted Odds Ratio (AOR)=3.03;95 % CI 1.15-7.98). Those living in families below Guaranteed Minimum Income (GMI) have a probability 4.63 times greater to become stunted compared to those in families with above Guaranteed Minimum Income (GMI) (Adjusted Odds Ratio (AOR)=4.63; 95 % CI (1.701-12.63). Furthermore, toddlers without exclusive breastfeeding were discovered to have the 4.53 times greater probability to become stunted compared to those with exclusive breastfeeding (Adjusted Odds Ratio(AOR)= 4.53; 95 % CI (1.64-12.49).(Table 3)

Table 1: Respondents characteristics

Variables	Case		Control	
	N	%	n	%
Mother Characteristics				
Education Level				
Low	10	20,4	47	48
High	39	79.6	51	52
Occupation				
Unemployed	17	34.5	56	57.1
Employed	37	34.9	30	61.2
	Mean (Min - Max), year		Mean (Min - Max), year	
Mother's age	32 (20-45)		32 (21-47)	
	Mean (Min - Max), month		Mean (Min - Max), month	
Toddlers' age	26 (10-59)		32 (11-55)	

Table 2: Independent Factors Associated with Stunting among 12-59 months old toddlers

Variable	Case		Control		p-value	OR,95 % CI
	N	%	n	%		
Latrine/Toilet Ownership						
Yes	85	86.7	41	83.7	0.66	0,716 (0,276-1,860
No	13	13.3	8	16.3		
Family Members						
≤ 4 people	11	23.4	45	45.1	0.02	2.93 (1.35-6.39)
> 4 people	37	34.9	30	61.2		
Re-occurring diarrhea						
No	70	71.4	26	53.1	0,02	2.464 (1,214-5,002)
Yes	28	28.6	23	46.9		
Worm Infection						
Negative	91	92.9	39	20.6	0.02	3.63 (1,289-10.204)
Positive	7	7.1	10	20.4		
Exclusive Breastfeeding						
Yes	14	28.6	61	62.2	0.0001	4.12 (1.96-8.66)
No	35	71.4	37	37.8		
Child-rearing						
Adequate	17	34.7	56	57.1	0.01	2.51 (1.23-5.11)
Inadequate	34	32.1	25	51		
Economy Status						
> Guaranteed Minimum Income (GMI)	12	24.5	61	62.2	0.0001	5.083 (2.54-10.96)
≤ Guaranteed Minimum Income (GMI)	37	75.5	37	37.8		
Healthcare Facility Use						
Yes	18	36.7	57	51	0.02	2.39 (1.182-4.485)

No.	31	63.3	41	49	

Table 3. Variables associated with stunting, multivariate analysis

Variables	Case		Control		Crude OR (95 % CI)	Adjusted OR (95 % CI
	n	%	N	%		
Child-rearing						
Adequate (reff)	17	34,7	56	57.1	2.51(1.	3.03(1.
Inadequate	32	65.3	42	42.9	23-5.11)	15-7.98)
Economy Status						
> UMR (reff)	12	24.5	61	62.2	5.083(2	4.63(1.
≤ UMR	37	75.5	37	37.8	.54-10. 96)	701-12. 63)
Exclusive Breastfeeding						
Yes (reff)	14	28.6	61	62.2	4.12(1.	4.53(1.
No	35	71.4	37	37.8	96-8.66)	64-12.4 9)

IV. Discussion

The purpose of this study was to determine the external factors associated with stunting in 12-59 months old toddlers. The results show that family contributes a lot in fulfilling the needs such as nutrition, affection, and child-rearing of toddlers and children. This is possible because child-rearing enables family members to combine knowledge, resources, behaviors, and food safety to promote and maintain a healthy status. [7-10] This is consistent with the findings of Reyes H (2004) that the role of the family in child-rearing influences their nutritional status and that there are differences in how it is conducted in rural areas and the cities [7,11] However, the nutritional status of children in families can be improved through strategies such as adequate child-rearing, family counselling, home visit by healthcare personnel, and proper training on food and nutrition [12-14].

Furthermore, the economic status of the family was determined by the monthly income. However, those with income below the district regional's standard (Guaranteed Minimum Income) are categorized as a low economy class and vice versa. Moreover, the findings prove that low income is associated with stunting occurrence because families in this class have little access to food and healthcare service when experiencing any form of illness. [15,16] Singh (2006) further reported that low economy is associated with poverty which affects nutritional intake because of the inability to buy foods to be consumed. [17] It has also been reported that the wealth of a family has the ability to support the children's nutritional needs, thereby, increasing their growth and cognitive ability maximally. [18]

Exclusive breastfeeding is defined to be the intake of nothing other than breastmilk by babies for the first 6 months of their lives except for medicine and vitamins when needed. [19] This is important because of the nutritional contents of breastmilk which is needed by babies for their growth. It also contains anti-bacterial and anti-virus that protects them from infections. [20] The findings are consistent with the submission of Kuchenbecker et al (2015) that exclusive breastfeeding helps the growth of children below 2 years old. [21] It was also reported to have great biological effects and important consequences in achieving nutritional status in children when given for the first six months of birth. [22]

V. Conclusion

The result shows there is a need to pay to some external factors in order to prevent stunting in toddlers in rural areas. They are found to include child-rearing, family's economic status, and exclusive breastfeeding. Therefore, a collaboration between healthcare personnel and the society is required, especially in educating and informing about proper and adequate child-rearing, encouraging exclusive breastfeeding and empowering the society to improve their family's economy.

The limitation of this study enables the possibility of recall and misclassification bias.

Competing Interests

The Author declares that They have no competing interests.

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