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Child Feeding Practices and Stunting: A Case-Control Study in Jember Regency of Indonesia

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Abstract

Stunting becomes the main nutritional problem which is a consequence of long-term, cumulative inadequacies of health and nutrition. Child feeding practices by good parents can prevent stunting in children from an early age. Child feeding practices include early breastfeeding initiation, exclusive breastfeeding, complementary feeding practice, and frequency of feeding. The purpose of this study is to analyze the effects of child feeding practices on stunting in children aged 12-36 months in Jember Regency. The sample was selected using a simple random sampling technique, totaling 220 mothers. The data were analyzed using chi-square statistic tests and multiple logistic regression tests. The results of the test discovered that most of the respondents were low educated mothers and low-income families. The significant determinants associated with stunting were exclusive breastfeeding (OR = 3.30; 95%CI 1.85-5.90), complementary feeding practices (OR = 1.86; 95%CI 1.04-3.33), and frequency of feeding (OR = 1.95; 95%CI 1.84-3.51). Exclusive breastfeeding is the major determinant for stunting in toddlers and therefore should be a priority program to improve the nutritional status of children in early ages of life.

Keywords: *stunting; exclusive breastfeeding; complementary feeding practice; frequency of feeding*

Introduction

Globally World Health Statistic 2014 of the World Health Organization (WHO) reported that in 2012 more than 162 million of the world's children, particularly in developing countries, were categorized as stunting¹. Stunting or low height-for-age is a reduced growth rate in human development or a slowing down of skeletal growth and height. It reflects a process of failure to reach linear growth potential. It is a largely irreversible outcome of inadequate nutrition and repeated bouts of infection during the first 1000 days of a child's life².

Stunting has short-term and long-term effects on individuals and societies. In the case of short-term effects, when a child is malnourished during the first 1000 days of life, it results in a weaker immune system and a higher risk of severe infectious diseases,

including diarrhea and pneumonia³, which often end with mortality, morbidity, and disability. In the case of long-term effects, stunting has long-term effects on individuals and societies, including diminished cognitive and physical development, reduced productive capacity and poor health, and an increased risk of degenerative diseases such as diabetes⁴. Also, they are more likely to suffer from chronic diseases, such as high blood pressure, heart disease, and obesity. These health impacts have devastating consequences for social and economic outcomes. Poorly nourished children are more likely to complete fewer years of school and have lower productivity as adults, including 10 percent lower earnings over their lifetime⁵.

In Indonesia the problem of stunting is stagnant but it is significantly a critical problem. As reported by Riskesdas (2013), stunting prevalence reached 37.2% in composing of 18% of very stunting and 19.2% of moderate stunting, 35.6% in 2010, and 36.80% 2007. In some provinces, the prevalence of stunting exceeds national prevalence. These figures made serious in stunting prevalence; consequently, it requires much

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more attention and intervention⁶.

Child feeding practices are a critical determinant to support the child's growth and development according to the stage of age. Inappropriate child feeding practices specifically indirect early breastfeeding initiation in one hour after birth, non-exclusive breastfeeding, and inappropriate complementary food can be increased risk of stunting in children. However, inadequate child feeding practices in terms of variety, frequency, and quality can depress the child immunity system. Furthermore, lack of immunity system leads to an increase in disease and the probability that a child will grow inadequately and child can be stunted⁷.

Jember Regency still occupies the second position of districts with the highest stunting prevalence in East Java (39.3%)⁸. Therefore, Jember Regency has become one of the stunting priority districts in East Java. Arjasa and Kencong sub-districts of Jember Regency are the highest prevalence stunting areas (39.30% and 38.78%)⁸. The objective of this study is to analyze the effects of child feeding practices on stunting in children aged 12-36 months in Jember Regency, Indonesia.

Material and Method

The design of the study was a case-control study that determined if an exposure is associated with an

outcome by compared the cases and the controls. The study was conducted in Arjasa and Kencong sub-districts of Jember Regency in March till April 2018. A simple random sampling was used to select a sample of 220 mothers with children aged 12-36 months (110 stunting children as a case group and 110 non-stunting children as a control group).

Data of child feeding practices were obtained from structured interviews with questionnaires and observations. All of the questionnaires were calculated by the validity and reliability test. Furthermore, to examine the effect of child feeding practices on stunting, the data were submitted to the bivariate analysis with chi-square and multivariate analysis with multiple logistic regression with 95% confidence interval and significance level $p < 0.05$.

Findings

Table 1 shows that most of the stunting children were male (60.0%) while most of the non-stunting children were female (50.9%). Maternal age in stunting and non-stunting children were mostly between 26-35 years (48.6%). Most mothers of children (63.2%) had low education (elementary schools and junior high schools). Furthermore, most of the fathers were unskilled workers (40.9%).

Table 1. Characteristic of Respondent

Characteristics	Stunting		Normal		Total (n,%)
	N	%	n	%	
Sex					
Male	66	60,0	54	49,1	120 (54,5)
Female	44	40,0	56	50,9	100 (45,5)
Mother's Age (years)					
17-25	27	24,5	35	31,8	62 (28,2)
26-35	56	60,0	51	46,4	107 (48,6)
36-46	27	24,5	20	18,2	47(21,4)
47-55	0	0	4	3,6	4 (1,8)

Cont... Table 1. Characteristic of Respondent

Mother's Education					
Primary Education	66	60,0	73	66,4	139 (63,2)
Secondary Education	34	30,9	32	29,1	66 (30,0)
Tertiary Education	10	9,1	5	4,5	15 (6,8)
Father's Occupation					
Unemployed	0	0	3	2,7	3 (1,4)
Farmer/Fisherman/Unskilled Worker/Carpenter	52	47,3	38	34,5	90 (40,9)
Public Servants/Police/Army	8	7,3	5	4,5	13 (5,9)
Private Servants	8	7,3	20	18,2	28 (12,7)
Freelance	42	38,2	44	40,0	86 (39,1)

Table 2. Summary of bivariate analyses the investigated variables for stunting

Variables	Stunting status				Total n (%)	OR	p	OR (95% CI)
	Yes		No					
	n	%	n	%				
Early breastfeeding initiation								
No	33	15.0	39	17.7	72 (32.7)	0.78	0.389	0.44 – 1.37
Yes	77	35.0	71	32.2	148 (67.3)			
Exclusive breastfeeding								
No	75	34.1	40	18.2	115 (52.3)	3.75	<0.001	2.14 – 6.55
Yes	35	15.9	70	31.8	105 (47.7)			
Complementary feeding practice								
Poor	72	32.7	49	22.3	121 (55.0)	2.36	0.002	1.37 – 4.06
Good	38	17.3	61	27.7	99 (45.0)			
Frequency of feeding								
< 3 times/day	51	23.2	34	15.5	85 (38.6)	1.93	0.019	1.11 – 3.35
≥ 3 times/day	59	26.8	76	34.5	135 (61.4)			

Table 2 shows that the number of children who had early breastfeeding initiation was higher than children who did not get early breastfeeding initiation. Most of the stunting children did not get exclusive breastfeeding from the mothers. The majority of complementary feeding practices in children whose stunting are poor. However, the frequency of feeding in stunting and normal group was largely more than equal to three times a day.

The result of statistical analysis with the Chi-square tests showed that three independent variables significantly affect the incidence of stunting in children. It shows the results of Chi-Square test between exclusive breastfeeding and the risk of stunting was significant ($p < 0.001$), complementary feeding practice was significantly affected stunting ($p = 0.002$), and frequency of feeding, have significantly related to the risk of stunting in children ($p = 0.019$). While the early breastfeeding initiation not significantly affected stunting in children ($p = 0.389$).

Table 3. Summary of the results of multiple logistic regression

Independent Variable	OR	CI (95%)		p
		Lower	Upper	
Get exclusive breastfeeding	3.30	1.85	5.90	<0.001
Poor complementary feeding	1.86	1.04	3.33	0.037
Frequency of feeding < 3 times/day	1.95	1.84	3.51	0.026

Table 3 shows the results of multiple logistic regression on the risk factors of stunting in children. Factors that increased the risk of stunting in children under five did not get exclusive breastfeeding, poor complementary feeding, and frequency of feeding < 3 times/day. Children who were not given exclusive breastfeeding had a higher risk for experiencing stunting 3.30 times compared with children who given exclusive breastfeeding (OR = 3.30; 95% CI = 1.85 to 5.90; $p < 0.001$). Children with poor complementary feeding had 1.86 times higher risk of developing stunting compared with those with good complementary feeding (OR =

1.86; 95% CI = 1.04 to 3.33; $p = 0.037$). The results also indicated that children who had feeding < 3 times/day were at risk of stunting 1.95 times greater than children who had feeding ≥ 3 times/day (OR = 1.95; 95% CI = 1.84 to 3.51; $p = 0.026$). Based on the test, the results indicated that exclusive breastfeeding was the dominant factor in the risk of stunting in children.

Discussion

The respondents of this study were dominated by low educated mothers and low-income family. Mother's education and household condition have important influences on children's health status irrespective of the stage of development. Education is the key to further improvement in child nutrition, which can influence the child feeding practice of the mother. Low educated mothers commonly have less ability and less opportunity to maintain better child feeding practice in their children. Furthermore, low-income family has to lack access to information and health facilities, so they tend to perform poor child feeding practice than middle and high-income family^{9,10}.

The result of the present study has shown that exclusive breastfeeding, complementary feeding practice, and frequency of feeding had a significant effect on stunting. Nevertheless, early breastfeeding initiation did not have a significant effect on stunting. Early breastfeeding initiation can allow the children to get colostrum as the protection factor for the children's health in the future. The result of this study was inconsistent with other studies showing that there is a negative correlation between early breastfeeding initiation and stunting¹¹. Other studies showing that early breastfeeding initiation can prevent stunting specifically in one thousand early days of life^{12,13}.

Exclusive breastfeeding affects stunting in children. Exclusive breastfeeding has many benefits such as the best nutritious food for the baby until six months old, antimicrobial agents and hygiene. The longer duration of the breastfeeding showing that can protect children from many serious health problems and degenerative disease that cause of death in the future such as gastrointestinal infection and respiratory tract infection¹⁴. Another study shows that the duration of breastfeeding has a negative correlation with stunting. The children who had exclusive breastfeeding for six months until twelve months have less risk of stunting than the children that had breastfeed less than six months. These differences

can be caused by culture, social-economic dynamic, and the mother's education^{15,16}.

Complementary feeding practice is a complex behavior that includes timing of complementary feeding, variety of complementary food, food preparation methods, quantity and quality of food, responsive feeding, safe food preparation, and food storage. The result of this study showing that complementary feeding practice has a significant effect on stunting. Poor complementary feeding practice can cause an inadequate intake of macronutrient and micronutrient. Inadequate intake of food in the early days of life of children can impair growth so that children have a higher risk to be stunting¹⁷.

The frequency of feeding also affects stunting in children. Most respondents performed three or more feeding for their children in one day. The result of this study is consistent with other studies showing that children who feed less than three times a day have a higher risk to be stunted than children who feed three times a day or more. Children who feed less than three times a day associated with a higher risk of inadequate intake of nutrition¹⁸. Furthermore, the children are not susceptible to certain malnutrition which in turn can aggravate health conditions and a higher risk of infectious diseases^{7,19}.

Conclusion

Exclusive breastfeeding, complementary feeding practice, and frequency of feeding affect stunting in children. Based on these conclusions, it is suggested to Community Health Center to improve mother's capability specifically in child feeding practice to prevent stunting with comprehensive counseling. Further research is needed on other factors that affect stunting in children specifically the identification of intake of nutrient consumption in other micronutrients.

Conflict of Interest: There was no conflict of interest in the study.

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