

The correlation breastfeeding and complementary feeding with stunting among children aged 25-36 months in Loano District Purworejo Regency



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ABSTRACT

Stunting is a malnutrition that occurs at first 1000 days of birth, child looks shorter than his age. Stunting has long-term effects on individuals and societies; including diminished cognitive and physical development reduced productive capacity and poor health. Stunting becomes a big problem for Banyuasin Primary Health Care because of its high prevalence of 20.3% in 2018. But the achievement of exclusive breastfeeding is low at 66.6%. This study aimed to identify the relationship breastfeeding and complementary feeding with stunting among children aged 25-36 months in Loano Distrik Purworejo Regency, Central Java. This was an analytic observational study with a case-control design. The subjects were mothers and children aged 25-36 months. The sample size used was 88 respondents with 44 as the stunting group and 44 as the control group. Sampling technique with Probability Proportional to Size. Analysis using Chi-Square and logistic regression. Exclusive breastfeeding ($p=0,000$), first complementary feeding time ($p=0.002$), age of mother ($p=0.043$), and mother's education ($p=0.042$) were related with stunting. Whereas mother's MUAC, mother's height, and duration of breastfeeding were not related to stunting. The factor that most influences the incidence of stunting is exclusive breastfeeding (OR=5,36, CI=2,10-13.67). For this reason, exclusive breastfeeding for infants aged 0-6 months is recommended.

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INTRODUCTION

Stunting is a major health problem for children aged less than 5 years in low and middle-income countries¹ including Indonesia. According to UNICEF shows that almost one-third of children under the age of five in developing countries have a short body. In 2018 the prevalence of stunting in Indonesia reached 30.8%²(exceeds WHO targeting stunting <20%). In developing countries, the prevalence of stunting begins to increase at around three months of age and then slows down for about 2 years.³

Stunting is a condition of growth failure that occurs in the first 1000 days of life starting from fertilization until the child is 2 years old, or afterward, so the child is too short for his age.^{4,5} A z-score of height for age index (HAZ) $< -2SD$ was defined as stunted and HAZ $< -3SD$ as severe stunting.⁶

Factors cause stunting according to WHO, immediate causes, and context. Immediate causes include household and family factors, inadequate feeding factors, breastfeeding, and infection. While context are social and social factors which include: political economy, health and health services, education, social and culture, agriculture and food and water systems, sanitation and the environment.⁷ Stunting is caused by insufficient intake of nutritious food and poor health conditions which can cause stunted growth. Stunting may begin early in pregnancy, infants, and early childhood because a diet with low-quality nutrition becomes inadequate nutritional intake. Poor socio-economic conditions and an increased risk of frequent and early exposure to adverse conditions, such as illness or inappropriate feeding practices may give rise to high levels of stunting.⁸

Factors related to stunting are maternal education, maternal height, and maternal age⁹, maternal mid-upper arm circumference (MUAC) at pregnancy and exclusive breastfeeding.¹⁰ Several studies have shown that stunting is influenced by high infections, failure to meet micronutrient requirements, a challenging environment, and inadequate provision of care.¹¹ Children who get complementary feeding at an inappropriate time that is before the age of 6 months or even more than 6 months have a risk of 2.8 times to become stunting (z score < -2).¹² Study in Jamaica, Gaskin et al. found that stunting in the first 2 years of life was associated with an increase in systolic blood pressure at the age of 7-8 years and women who were short would usually give birth to short children, the incidence of growth retardation in the womb was higher in dwarf girls and this created a cycle of intergenerational stunting.^{11,13}

The impact of stunting is that children's intelligence is not optimal, becomes more vulnerable to disease, and barriers to cognitive development, educational performance and economic productivity in adulthood and on maternal reproductive outcomes.^{1,13} Stunting has long-term effects on individuals and society, including reduced cognitive and physical development reduces productive capacity and poor health, and an increased risk of degenerative diseases such as diabetes.¹³

Handling of stunting is done through specific interventions aimed at the first 1,000 days of a child's life that will reduce stunting by up to 30%.¹⁴ WHO recommends the intervention of the first 1000 days of birth by giving exclusive breastfeeding to infants aged 0-6 months, after which they begin to be given complementary feeding and continue breastfeeding until the age of 2 years.^{6,15}

Based on Nutrition Status Monitoring data in Indonesia, stunting has the highest prevalence over the past 3 years compared to other nutritional problems. The prevalence of short toddlers in Indonesia has increased from 2017 which is 29.6% to 30.8% in 2018. For Central Java, the prevalence of stunting increased by 2.8% in 2017 by 28.5% to 33.3% in 2018.¹⁶ The prevalence of stunting in Purworejo Regency is lower than the Province which is 9.7%. But for the Banyuasin Primary Health Care which is part of Loano district, Purworejo, the prevalence of stunting in 2018 is 20.3%. The high stunting case in the Banyuasin Primary Health Care area is inversely proportional to the low achievement of exclusive breastfeeding which is equal to 66.6%. This study aimed to identify the relationship between breastfeeding and complementary feeding with stunting among children aged 25-36 months in Loano District Purworejo Regency, Indonesia.

METHOD

This study was conducted in the Loano district Purworejo Regency Central Java. Data were collected on January-February 2020. This type of research is analytic observational with case-control design. The data used are nominal and ordinal categorical data. The dependent variable was expressed as a dichotomous, that is, category 0 (not stunted (>-2SD) and category 1 (stunted (>-2SD) or severely stunted (>-3SD)).

The sample in this study was children aged 25-36 months in the Loano District area. Large sample using Lemesho based on previous research, so the sample size was obtained 44 for the stunting group. The control group with a ratio of 1: 1 using sex matching. So that the total sample of 88 respondents. Research power 80%, and 95% confidence interval. Samples are taken by Probability Proportional to Size (PPS) after the population meets the inclusion and exclusion criteria. Inclusion criteria in this study are children registered in the Posyandu register, children with complete immunization status, children with normal birth weight and birth length \geq 48 cm. While the exclusion criteria: BMI of mothers before pregnancy > 30, and working mothers.

The sampling technique by interviews with mothers using the Structured Interview Guidelines and measurements of children's height to get primary data. Secondary data of this study include child nutritional status, birth weight and length, maternal LILA, maternal age, mother's education and occupation. The technique used by researchers to obtain secondary data from the Mother and Child Health Book "Buku Kesehatan Ibu dan Anak"

The research was carried out utilizing the researchers with 2 nutritionists coming directly to the selected sample house. After getting research explanations and informed consent, measure the height of the mother and toddler by 2 nutritionists with microtoice and determine stunting criteria with WHO standards, and interviews with mothers.

Univariate analysis in the form of frequency distribution Then bivariate analysis using chi-square. Multivariate analysis using logistic regression. The ethical clearance was obtained from the Research Ethics Committee at Poltekkes Kemenkes Yogyakarta, with certificate of ethics No. KEPK/POLKESYO/0422/XII/2019.

RESULTS

The result of this study are presented in the following table.

Table 1. Frequency Distribution of Independent Variables

Variabel	Not Stunting		Stunting		Total	
	Frekuensi	%	Frekuensi	%	Frekuensi	%
Exclusive breastfeeding						
6 months	32	72.7	14	31.8	45	51,1
<or >6 months	12	27.3	30	68.2	43	48,9
Duration of breastfeeding						
\geq 24 months	25	56.8	26	59.1	51	58,0
< 24 months	19	43.2	18	40.9	37	42,0
First complementary feeding time						
6 months	35	79.5	19	43.2	54	61,4
<or>6 months	9	20.5	25	56.8	34	38,6
Mother's height						
\geq 150 cm	40	90,9	33	75	73	83,0
<150 cm	4	9,1	11	25	15	17,0
Mother's MUAC						
\geq 23.5 cm	32	72,7	25	56,8	57	64,8
< 23.5 cm	12	27,3	19	43,2	31	35,2

Mother's age						
20-35 years	40	90,9	32	72,7	72	81,8
<20 years and >35 years	4	0,9	12	27,3	16	18,2
Mother's education						
Middle or high education	15	34,1	7	15,9	22	25
Basic education	29	65,9	37	84,1	66	75

Majority of children who are not stunting are children who get exclusive breastfeeding for 6 months (72.7%) and the most stunting children have a history of not exclusive breastfeeding (63.6 %). the first complementary feeding time, most stunted children get complementary feeding that is not appropriate (56.8%), less than 6 months or more than 6 months. Whereas the duration of breastfeeding showed the same data between non-stunting and stunting, most of the duration of breastfeeding was ≥ 24 months. The majority were normal to Mother's height, mother's MUAC and age of the mother in the stunting group and the non-stunting group. As for the mother's education, the majority of respondents obtained basic education (elementary and junior high school) of 75%.

Table 2. Bivariate Analysis of Independent Variables with Stunting

Variabel	Non Stunting		Stunting		Total		P value
	N	%	N	%	N	%	
Exclusive breastfeeding							
6 months	32	72.7	14	31.8	45	51,1	0,000*
<or >6 months	12	27.3	30	68.2	43	48,9	
Duration of breastfeeding							
≥ 24 months	25	56.8	26	59.1	51	58,0	0,50
< 24 months	19	43.2	18	40.9	37	42,0	
First complementary feeding time							
6 months	35	79.5	19	43.2	54	61,4	0,002*
<or>6 months	9	20.5	25	56.8	34	38,6	
Mother's height							
≥ 150 cm	40	90,9	33	75	73	83,0	0,303
<150 cm	4	9,1	11	25	15	17,0	
Mother's MUAC							
≥ 23.5 cm	32	72,7	25	56,8	57	64,8	0,090
< 23.5 cm	12	27,3	19	43,2	31	35,2	
Mother's age							
20-35 years	40	90.9	32	72.7	72	81,8	0,043*
<20 years and >35 years	4	0,9	12	27.3	16	18,2	
Mother's education							
Middle or high education	15	34,1	7	15,9	22	25	0,042*
Basic education	29	65,9	37	84,1	66	75	

From the table show that the variables were significantly related to stunting ($p < 0.05$) are mother's age ($p = 0.043$), mother's education ($p = 0.042$), exclusive breastfeeding ($p = 0.000$), and first complementary feeding time ($p = 0.002$).

Multivariate analysis use logistic regression test that requirement is $p > 0.25$. There 5 variable that have $p > 0.25$. Multivariate analyses showed in this table:

Table 3. Multivariate Analysis of Independent Variables with Stunting

Variabel	OR	95% CI		ρ
		Lower Limit	Upper Limit	
Exclusive breastfeeding	5,36	2.10	13.67	0.000*
First CF time	3.00	0.99	9.134	0.0052
Mother's MUAC	2.10	0.77	5.69	0.144
Mother's age	2.29	0.60	8.73	0.224
Mother's education	1.41	0.32	6.21	0.65

Table 3. This study shows that the variable that most influences the incidence of stunting is exclusive breastfeeding. The power can be judged by the OR value of 5.36 which means that a child who does not get exclusive breastfeeding will be 5 times more likely to become stunted than children who are exclusively breastfed.

DISCUSSION

In this study, the variable that was proven significantly related to stunting was exclusive breastfeeding. The same study stated that there was a relationship between exclusive breastfeeding and the incidence of malnutrition (stunting, wasting and underweight) with bivariate analysis showed $p = 0.001$ ($p < 0.05$).¹⁷ Children aged 24-59 months who are given exclusive breastfeeding during the first 6 months of life will grow to normal height compared to children who do not get exclusive breastfeeding.¹⁸

Children under five who are exclusively breastfed can reduce the risk of stunting. Caused at the age of 0-6 months, mothers who give exclusive breastfeeding that can form immunity or immunity for children under five so they can avoid infectious diseases such as diarrhea and respiratory diseases. Low exclusive breastfeeding is a trigger for the occurrence of stunting in children caused by past events and will have an impact on the child's future, on the contrary good breastfeeding by the mother will help maintain the child's nutritional balance so that normal child growth is achieved.¹⁹

Kramer's research shows that babies who are exclusively breastfed for three months are slightly better at achieving body weight compared to exclusive for six months, but babies who are exclusively breastfed for six months of height grow faster at nine months and 12 months. Babies who breastfeed exclusively do not show growth failure.²⁰

The results of interviews with mothers who were respondents of the study showed that the reason for mothers who did not give exclusive breastfeeding to their children was that breast milk had not come out when the child was born so the baby was given water or honey or formula milk as a substitute for breastfeeding (prelacteal feeding). 35% of babies get prelacteal feeding in the form of formula milk (20%) honey (11.4%), water (8.6%). After the milk is smooth, the milk is given to her child with formula milk added or some only give breast milk. Study in Nepal, that the practice of exclusive breastfeeding in Nepal is not optimal because there are still those who provide water (13.7%), non-milk liquids (4.7%), formula milk (11.5%) and solid food (29.2%)²¹ The practice of giving prelacteal feeding in the form of honey, water or formula milk as a substitute for breast milk will adversely affect infants who are still vulnerable to infection.²¹ Research in Ghana, states

that toddlers who do not get prelacteal feeding will reduce the incidence of stunting by 0.6.²²

In this study also found exclusive breastfeeding that is not appropriate that is until more than 6 months. Mother said giving extra food besides breast milk at the age of 7 months on the grounds the baby did not want to be given complementary feeding such as rice porridge or banana. Prolonged exclusive breastfeeding (>6 months) can cause the baby to lose the opportunity to practice the ability to receive other foods, other than liquid food. While breast milk can only meet the energy needs of infants around 65-80 percent. The nutritional content of breast milk is also very little to meet the daily needs of babies if they have to be consumed alone without complementary feeding. then it causes growth faltering because babies have nutritional deficiencies. From the age of 6 months breastfeeding alone cannot support the nutritional needs of infants so additional sources of nutrients from complementary feeding are needed.²³

In this study, it was shown that the first complementary feeding time significantly associated with stunting. If complementary feeding time too early, the baby's digestion cannot absorb the necessary nutrients, and if given too late, the nutritional content contained in breast milk is not sufficient for optimal and sustainable growth. It is recommended that complementary feeding be given at around 6 months of age.²⁴ Infants aged ≤ 4 months who are given complementary feed are associated with poverty which results in diets with inadequate nutrition and microbiologically insecure, leading to nutritional deficiencies and risk of exposure to pathogenic bacteria from unhygienic food, and affecting the gastrointestinal tract. The higher prevalence of infection and disease (diarrhea and fever) occurs in children who have been given complementary feeding earlier (≤ 4 months), so that it will eventually become stunted.²⁵ The frequency of complementary feed consumed by children is more closely related to the incidence of stunting than at first complementary feeding time.²⁴ The conclusion that affects the nutritional status of the child is not only the time at which complementary feed was first introduced but also the amount and balance of the food given is considered to affect the nutritional condition of children.

In interviews with mothers of children under five, it was found that complementary feed given at inappropriate times (aged <6 months or > 6 months) was 36.4% in the form of baby porridge (22.7%), bananas (7.9%), rice porridge (5.9%) and starch (2.3%). The lowest age to get complementary feed is 3 months. Mother of toddlers said that babies always cry fussy marked baby hungry, so given solid food. After being given solid food the baby becomes fussy. This is due to the lack of understanding of the mother about the procedure of giving complementary feed to infants.

Complementary feed should not be given too early, nor should it be given too late. In this study, there were 5.6% of infants given supplementary food at > 6 months of age. Delay in the provision of complementary feed will have an impact on not meeting the nutritional needs of children. The introduction of complementary feed for more than 8 months is a risk factor or anemia. Infants aged up to 6 months use iron reserves carried while still in the womb, after 6 months of age babies need iron from MP ASI. Because the need for iron is increasing.²⁶

This study shows mother's age is significantly related to stunting. Babies born to young mothers (aged <20 years) have a risk of experiencing delays in height growth. This may be related to the fact that young mothers (<20 years) do not have the experience and good knowledge in providing appropriate child care.⁸ Pregnant women at age > 35 increase the risk of stillbirth, premature birth, IUGR and chromosomal abnormalities.^{27,15}

Children of mothers younger than 19 years have an increased risk of stunting by 30-40% and fail to complete secondary school. Due to the lack of maternal experience regarding optimal feeding methods, and the lack of awareness about hygiene and health

care, children of young mothers in LMICs experienced increased mortality.¹⁵ The factor to consider is the mother's age while pregnant. Pregnant women aged less than 20 years do not have sufficient experience and knowledge to care for their pregnancy.^{8,15} While pregnant women 35 years or older tend not to be eager to care for their pregnancy. Older women (> 35 years old) experience decreased absorption of nutrients which will cause unbalanced food intake and cause malabsorption, therefore, nutritional needs in infants are not met. The quality of the mental condition and readiness of the mother during pregnancy affect the baby.¹⁵

Based on the results of this study found a relationship between maternal education and the incidence of stunting aged 25-36 months in Loano District, Purworejo Regency. Mothers who do not have formal education will be at risk of being stunted 3 times.¹⁷ The incidence of stunting for children born to uneducated mothers is 5 times higher than mothers with higher education. Children born to mothers with primary education are 3.6 times more likely to be stunted than mothers with high education.²² Maternal education was also significantly associated with child growth in children 24–59 months and an increase in maternal education since 2000 in South Ethiopia was associated with a reduction in the incidence of stunting for this age group.²⁸

An educated mother is better able to manage efficiently existing household resources. Even basic education can improve mothers' nutritional knowledge, which leads to healthy homes. Low education can also be linked to low socioeconomic status. Higher educational status is also associated with lower fertility rates which result in an appropriate birth spacing thereby reducing the number of children under five in the household which then leads to a reduction in the risk of child stunting.²² Mothers with education have better capacity in managing households in terms of maintaining adequate nutrition for children. This is very important for the success of a prevention program against child malnutrition.¹⁵

Based on the results of the multivariate analysis using logistic regression showed that the most dominant variable for the occurrence of stunting in toddlers aged 25-36 months in Loano Purworejo District was exclusive breastfeeding with OR 5.36. Exclusive breastfeeding is the dominant factor of stunting in Rwanda.²⁹ Exclusive breastfeeding is also the most dominant factor associated with stunting with OR 6.68 in Ethiopia.³⁰ Evidence in Indonesia which is a direct cause of the occurrence of stunting is including exclusive breastfeeding.³¹ The magnitude of the effect of exclusive breastfeeding on children's nutritional status, WHO recommends implementing interventions to increase breastfeeding during the first 6 months as a step to achieve the WHO Global Nutrition Targets 2025 regarding reducing the number of stunting in children under five years old.²²

CONCLUSION

Exclusive breastfeeding, the first complementary feeding time, mother's age and mother's education are predictors of stunting, while the duration of breastfeeding, maternal height, and maternal MUAC were not related to the incidence of stunting in children aged 25-36 months in the District Loano Purworejo. The most influencing factor for stunting in children aged 25-36 months in Loano district, Purworejo Regency is exclusive breastfeeding.

Efforts are needed to increase the coverage of exclusive breastfeeding, by increasing the quality and quantity of breastfeeding promotion for both pregnant and lactating mothers, as well as in the community and innovative efforts and support from various parties, both cross-program and cross-sector.

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