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## THE EFFECT OF EXCLUSIVE BREASTFEEDING AND DIARRHEA WITH STUNTING INCIDENCE

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### ABSTRACT

According to the 2020 Ministry of Health, stunting is a condition in which children have a relatively low length or height compared to their age, which could be measured by child anthropometry. The child was said stunted if he has a z-score  $< -2$  Standard Deviation (SD). The incidence of stunting could be caused by several factors such as child nutrition problems, social, economic conditions, infectious diseases, poor environmental sanitation, education, income, knowledge and others. The prevalence of stunting in Jambi Province will reach 22.4% in 2021, including Kerinci Regency which one of the contributors to stunting rates in Jambi Province. There were 10 stunting loci in Kerinci Regency including the working area of the Siulak Gedang Health Center with a total of 63 toddlers experiencing stunting in 2020. So the researchers are interested in finding relationships between several risk factors for stunting in the working area of the Siulak Gedang Health Center, Kerinci Regency in 2022.

This research method was quantitative with a case-control research design with a sample of 72 respondents, with a ratio of 1:1 (36 cases and 36 controls) with the criteria of mothers who have children aged 24-59 months. Data were obtained by conducting interviews using a questionnaire. The research was conducted from 9 May to 4 June 2022. Data were analyzed using univariate and bivariate methods using the chi-square test.

The results of this study indicate a relationship between diarrhea (p-value= 0.009 OR= 4.02 CI95%= 1.50-10.74). There is no relationship between exclusive breastfeeding (p-value= 0.637 OR= 0.72 CI95%= 0.28-1.81) with the incidence of stunting in toddlers.

**Keywords: Stunting, Exclusive Breastfeeding, Diarrhea**

## INTRODUCTION

Stunting (short) is a condition where a toddler has a length or height that is less when compared to the age of the child his age. This condition is measured by length or height that is

more than minus two standard deviations of the WHO child growth standard median. Stunting under five is a chronic nutritional problem caused by many factors such as socio-economic conditions, maternal nutrition during pregnancy, illness in infants, and lack of nutritional intake in infants. Stunted toddlers in the future will experience difficulties in achieving optimal physical and cognitive development (Kemenkes RI, 2018). Stunting receives greater attention compared to other nutritional statuses because apart from its higher prevalence, stunting also indicates something more serious than just short body size (Endang et al., 2021).

The incidence of stunting (short) under five is a major nutritional problem faced by Indonesia. Based on Nutrition Status Monitoring (NSM) data for the last three years, stunting has the highest prevalence compared to other nutritional problems such as undernutrition, underweight, and obesity. The prevalence of stunting in Indonesia in 2013 was 37.2%, this figure increased from 2010 with a prevalence of 35.6%, however, the prevalence of stunting decreased again in 2019, namely 27.67% with a target of 24.1% in 2020 (Kemenkes RI, 2021). Research conducted Kurniawati, (2020) with the title "Risk factors for stunting in toddlers in Kerinci district". Shows the results of the influence of family income on the incidence of stunting in toddlers.

Research conducted Maywita, (2018) with the title "risk factors causing stunting in toddlers aged 12–59 months in Kampong Baru Village, Lubuk Begalung District in 2015" the results show that there is a significant relationship between the level of education of the mother and the incidence of stunting in toddlers. The prevalence of stunting in Jambi province has decreased from 2018, namely 30.2% to 21% in 2019, but increased again in 2021 to 22.4%. (SSGI, 2021). Efforts to reduce the incidence of stunting must continue to be a concern for the government, given the achievement target that has not been met, namely the stunting incidence rate to fall to 16% in 2022 (Dinkes Prov. Jambi, 2022). The prevalence of stunting in Kerinci district in 2021 is 26.7%, which means that this figure is higher than the stunting incidence rate in Jambi province, which is 22.4% (SSGI, 2021).

Prevalence of intellectual toddlers in Indonesia tends to be static. The results of Basic Health Research in 2007 showed that the prevalence of toddlers in Indonesia was 36.8%. In 2010, there was a slight decrease to 35.6%. However, the prevalence of index children under five increased again in 2013, namely to 37.2%. Prevalence of toddlers surveyed will then be determined from the results of the 2018 Riskeisdas which will also be a measure of program success that has been pursued by the government (Kemenkes RI, 2018). the working area of the Siulak Puskesmas has a stunting prevalence rate of 4.1%, namely 63 cases out of 1540

toddlers, but out of 63 cases of toddlers there are only 36 toddlers aged 24-59 months who are in the Siulak Gedang Public Health Center work area (Dinkes Kab. Kerinci, 2019), so that research could be carried out by using a population of cases by using the criteria of age 24-59 months as a research sample. So that researchers were interested in conducting research based on the problems above, with the research title "The Effect of Exclusive Improving Breastfeeding and Diarrhea with Stunting Incidents" with a regional focus based on data by name by address stunting obtained from the Siulak Gedang Public Health Center, Kerinci Regency.

## METHOD

This research was a quantitative study that uses a casei-cointroleum index in which the sample cases in this study use a total sampling technique with a total of 36 cases with the criteria of mothers who have children aged 24-59 months and control using a ratio of 1: 1, namely 36 so that the total return on research is this is 72 reispontes. The purpose of this study was to find out the relationship between variable X (exclusive breastfeeding and incidence of diarrhea) and variable Y (incidence of stunting) in toddlers in the working area of the Siulak Gedang Public Health Center, Kerinci Regency by comparing the group of cases to the group of controls.

The analysis carried out in this study was bivariate analysis using the chi-square statistical test using the SPSS application. Data collection was carried out directly by interviewing respondents using a questionnaire instrument. This research was carried out in the working area of the The Siulak Gedang Public Health Center, Kerinci Regency, from May to June 2022.

## RESULTS

### Respondent Characteristics and Risk Factors

The results of the univariate analysis on the characteristics of the respondent and the risk factors for stunting are shown in the following table:

**Table 1. Characteristics of Respondent**

Variable	case		control		total	
	n	%	n	%	n	%
<b>Gender of Toddlers</b>						
Women	13	36.1	15	41.7	28	38.9
Man	23	63.9	21	58.3	44	61.1
<b>Toddler Age</b>						
<24 Months	1	2.8	0	0	1	1.4

24-36 Months	17	47.2	13	36.1	30	41.7
37-48 Months	12	33.3	16	44.4	28	38.9
49-60 Months	6	16.7	7	19.4	13	18.1
<b>Respondent's age</b>						
<20 Years	1	2.8	0	0	1	1.4
21-30 Years	11	30.6	18	50	29	40.3
31-40 Years	19	52.8	12	33.3	31	43.1
41-50 Years	5	13.9	6	16.7	11	15.3
<b>Household Income</b>						
Beautiful	11	30.6	14	38.9	25	34.7
Tall	25	69.4	22	61.1	47	65.3
<b>Father Education</b>						
Low	29	80.6	33	91.7	62	86.1
high	7	19.4	3	8.3	10	13.9
<b>Mother Education</b>						
Low	25	69.4	16	44.4	41	56.9
high	11	30.6	20	55.6	31	43.1
<b>Father's Employment Status</b>						
Doesn't work	10	27.8	17	47.2	27	37.5
Work	26	72.2	19	52.8	45	62.5
<b>Mother's Employment Status</b>						
Work	4	11.1	7	19.4	61	84.7
Doesn't work	32	88.9	29	80.6	11	15.3

Based on table 1 above, the distribution and frequency of the characteristics of the stunting risk factors in the work area of the The Siulak Gedang Public Health Center with a distribution of cases of 36 points and 36 points of control.

The gender of children under five in the group of cases, there were 13 women under five (36.1%) and men as many as 23 under five (63.9%). Meanwhile, in the co-ordinated group, there were 15 women under five (41.7%) and there were 21 under five men (58.3%). Overall, the number of male under-fives is more than female under-fives, namely 44 male under-fives (61.1%) and 28 female under-fives (38.9%) from a total of 36 cases and 36 control cases.

In the group of toddlers, the fewest cases were group of children aged <24 months, namely 1 toddler (2.8%), while the group with the most number of cases was group of 24-36 months, namely 17 toddlers (47.2%) out of a total of 36 toddlers. Meanwhile, in the koi-omposal, the least age group was the group aged <24 months, namely 0 toddlers, while the most number was group age 37-48 months, namely 16 children under five (44.4%) of a total of 36 children under five.

In the five-point group of respondents, the least number of cases were the group of <20 years of age, with 1 reis point or (2.8%) while most of the respondents were groups of 31-40

years, namely 19 points (52.8%). In the control group, the most were the group aged 21-30 years, namely 18 respondent (50%).

In the group of cases, households with low incomes were 11 rupees (30.6%) while households with high incomes were 25 rupees (69.4%) In the coingroup, households with low incomes were 14 rupees (38.9%), whereas households with high income are as many as 22 rupees (61.1%).

Fathers with high education were 29 people (80.6%) in the group of cases, while fathers with high education were 7 people (19.4%) from a total of 36 cases. Meanwhile, in the non-coordinated group, there were 33 people (91.7%) of fathers with high education, while 3 people (8.3%) of fathers with high education.

Mothers with high education were 25 people (69.4%) in the group of cases, while mothers with high education were 11 people (30.6%) from a total of 36 medals. Meanwhile, in the cointroile group, there were 16 mothers with high education (44.4%), and in the control group, women with high education were 20 people (55.6%). In the group of cases, fathers who did not work were 10 people (27.8%) and fathers who worked were 26 people (72.2%) from a total of 36 Reisponts. Meanwhile, in the non-working families, there were 17 working fathers (47.2%) and 19 working fathers (52.8%).

There were 32 working mothers (88.9%) and 4 working mothers (11.1%) out of a total of 36 respondents in the group of cases. Meanwhile, in the non-employed group, there were 29 working mothers (80.6%) and 7 working mothers (19.4%) out of a total of 36 reisponts.

**Table 2. Stunting Risk Factors**

Variable	case		control		total	
	n	%	n	%	n	%
<b>exclusive breastfeeding</b>						
No	17	47.2	20	55.6	37	51.4
Yes	19	52.8	16	44.4	35	48.6
<b>diarrhea</b>						
Yes	23	63.9	11	30.6	34	47.2
No	13	36.1	25	69.4	38	52.8

Based on table 2 above, the distribution and frequency characteristics of the risk factors for stunting in the The Siulak Gedang Public Health Center Work Area with a distribution of cases of 36 points and 36 points of control.

There were 19 toddlers (52.8%) who were exclusively breastfed and 17 toddlers (47.2%) who were not exclusively breastfed and 16 toddlers (44.4%) who were not exclusively breastfed and children who were not exclusively breastfed 20 toddlers

(55.6%) .

Toddlers with cases of diarrhea were 23 toddlers (63.9%) and toddlers without diarrhea were 13 toddlers (36.1%), while in the co-ordinated group of toddlers with diarrhea cases there were 11 toddlers (30.6%) and toddlers without diarrhea were 25 toddlers (69.4%).

The results of the bivariate analysis regarding the relationship between exclusive breastfeeding and the incidence of stunting in toddlers in the working area of the Siulak Gedang Public Health Center, Siulak Subdistrict, Kerinci Regency in 2022 can be seen in the following table:

**Table 3. Results of Bivariate Analysis of The Relationship Between Exclusive Breastfeeding and Stunting**

Exclusive breastfeeding	Stunting				Total		OR (CI 95%)	p-value
	case		control		n	%		
	n	%	n	%	n	%		
No	17	47.2	20	55.6	37	48.6	0.72	
Yes	19	52.8	16	44.4	35	51.4	(0.28-1.81)	0.637
<b>Total</b>	<b>36</b>	<b>100</b>	<b>36</b>	<b>100</b>	<b>72</b>	<b>100</b>		

Based on table 3 above, the results of statistical tests show a p-value of 0.637 (> 0.05) so it can be concluded that there is no significant relationship between exclusive breastfeeding and the incidence of stunting in toddlers in the working area of the Siulak Gedang Public Health Center, Siulak Subdistrict, Kerinci Regency, with the range of effect of OIR = 0.72 CI 95% = 0.28-1.81, meaning that exclusive breastfeeding is 0.72 times more at risk of experiencing stunting than babies who are not given exclusive breastfeeding.

The results of the bivariate analysis looking at the relationship between the incidence of diarrhea and the incidence of stunting in toddlers in the work area of the Siulak Gedang Public Health Center, Siulak Subdistrict, Kerinci Regency in 2022 can be seen in the following table:

**Table 4. Results of Bivariate Analysis of the Relationship of Diarrhea to Stunting**

diarrhea	Stunting				Total		OR (CI95%)	p-value
	case		control		n	%		
	n	%	n	%	n	%		
Yes	23	63.9	11	30.6	34	47.2	4.02	
No	13	36.1	25	69.4	38	52.8	(1.50-10.74)	<b>0.009*</b>
<b>Total</b>	<b>36</b>	<b>100</b>	<b>36</b>	<b>100</b>	<b>72</b>	<b>100</b>		

Based on table 4 above, it shows the results of statistical tests with a p-value of 0.009 ( $<0.05$ ) so it can be concluded that there was a significant relationship between the incidence of diarrhea and the incidence of stunting in toddlers in the working area of the Siulak Geidang Puskeimas, Siulak Subdistrict, Kerinci Regency, with The effect range of  $OiR = 4.02$  CI 95% = 1.50-10.74, meaning that babies with a history of diarrhea are 4.02 times more risk than babies who did not have a history of diarrhea.

## DISCUSSION

The results of this research were in line with the research conducted by (Domili et al., 2021) which shows that there was no significant relationship between exclusive breastfeeding and the incidence of stunting in toddlers, the authors explain that the problem of stunting was not only affected by exclusive breastfeeding, but many other factors, so that when provision of exclusive breastfeeding in infants has been carried out properly, it could be other factors that are more dominant in causing stunting in toddlers so that exclusive breastfeeding was not have a significant or significant effect on preventing stunting in toddlers. Research conducted by Novayanti et al., (2021) also stated that there was no significant relationship between exclusive breastfeeding and the incidence of stunting in toddlers.

Research conducted by Murtini *et al*, (2018) After statistical tests were carried out, it was shown that there was no significant relationship between exclusive breastfeeding and the incidence of stunting. He stated that in his research, exclusive breastfeeding does not have a high level of risk of stunting, but if exclusive breastfeeding is not given to babies, it actually increases the baby's risk of stunting, therefore, exclusive breastfeeding must still be carried out even though it does not show a significant effect. .

However, this not in line with the research conducted by Pratama, (2021) which shows the results of the statistical test  $p\text{-value} = 0.001$  so it was concluded that exclusive breastfeeding has a significant effect on the incidence of stunting in infants. This research shows that the majority of babies who experience stunting are babies who are not given exclusive breastfeeding by their mothers.

According to the research, the research results showed that there was no significant relationship between exclusive breastfeeding and the incidence of stunting because several other factors were not studied in this study, which factors were more dominant than exclusive breastfeeding. In addition, it could be caused by infectious disease factors caused by factors of poor environmental sanitation. Therefore, stunting cannot be prevented by simply paying



attention to one factor, but by paying attention to several factors out of several factors. So that prevention of stunting can be carried out optimally.

Even though in this study exclusive breastfeeding showed insignificant results between exclusive breastfeeding and the incidence of stunting, the researcher suggested that mothers should still provide exclusive breastfeeding to their babies, because babies who are not given exclusive breastfeeding are at risk of stunting, as has been discussed in supporting research above, that the incidence of stunting in babies who have been exclusively breastfed is caused by other, more dominant factors that were not examined in this study. Apart from that, children must also be given complementary foods that fulfill their nutrition at the age of 6-24 months, because stunting cannot be prevented from just one factor, mothers must also pay attention to good child nutrition.

The occurrence of diarrhea can cause long-term effects in the form of a height growth deficit. During the period of diarrhea experienced by toddlers, zinc minerals will also be lost in large quantities so that they need to be replaced to help heal diarrhea in children and also keep toddlers healthy in the following months. Where zinc supplementation is useful for reducing the duration and severity of diarrhea as well as avoiding the occurrence of diarrhea in the next 2-3 months which will have an impact on toddlers who experience stunting.

The results of this research are in line with the research conducted by Irawan et al, (2022) which shows the results of a relationship between diarrhea and the incidence of stunting in children, children who simultaneously experience diarrhea were at risk of experiencing stunting, this related to the impact of diarrhea experienced by children or infants causing children to experience malnutrition which is the cause of the stunting. There was a strong link between infection and malnutrition. Infection was a cause of malnutrition due to decreased co-consumption of food, decreased absorption of nutrients in the small intestine as well as increased catabolism of nutrients needed for tissue repair.

Research conducted by Lestari et al, (2021) stated the same thing that the occurrence of diarrhea was a risk factor for the occurrence of stunting as evidenced by the results of the analysis of the effect of diarrhea on the incidence of stunting with the outcome ( $p\text{-value} = 0.007 < \alpha 0.05$ ), which means that there was a significant relationship between diarrhea and the incidence of stunting. In line with the research conducted by Solin et al., (2019) The results showed that toddlers with frequent frequency as much as 93.3% of children with diarrhea experienced diarrhea in toddlers who experienced stunting with a very high category, while toddlers who simultaneously experienced diarrhea with normal category so that as



many as 6.7% of children were said not to be stunted.

However, this was not in line with the research conducted by Tatu et al., (2021) which states the opposite, that there was no significant relationship between diarrhea and the incidence of stunting in children, toddlers who rarely suffer from infectious diseases can experience stunting. This caused by stunting not only being affected by the frequency of infectious diseases but also being affected by the duration of the infectious disease and nutritional intake during the course of the infection. Many parents are very concerned about toddler eating patterns when toddlers are sick, something that is not done when toddlers are healthy because parents think only sick toddlers need nutritious nutritional intake.

This research yielded results that are consistent with the theory discussed in this study, that diarrhea has a significant relationship with the incidence of stunting, this is due to the fact that in the field there are still many problems with environmental sanitation which causes many babies to be infected with diarrhea. Prolonged diarrhea can cause malnutrition in infants so that the growth and balance of the baby can be hampered and cause stunting in babies. Researchers believe that mothers who have babies or toddlers can maintain the cleanliness of the environment where the child or baby lives, because environmental sanitation is a major factor in the occurrence of various infectious diseases, especially diarrhea which is a risk factor for stunting. With that said, the mother has already taken the first steps to prevent stunting for the baby in addition to other risk factors that the mother must also pay attention.

## CONCLUSION

The conclusion of this study is that there was a significant relationship between diarrhea and the incidence of stunting which is associated with the occurrence of malnutrition in children when children experience diarrhea, and there was no significant relationship between exclusive breastfeeding which is associated with several causative factors such as complementary feeding which can also affect occurrence of diarrhea.

## ABBREVIATIONS

WHO : *World Health Organization*; SD : Standard Deviation; NSM : Nutrition Status Monitoring

## COMPETING INTEREST

There is no conflict of interest in this research.

## AUTHORS' CONTRIBUTION

Muhammad Rifqi Azhary was the main researcher who selects the topic and develops the research design. Nada Amirah plays the role of analyzing data and compiling research articles.

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