

## Risk Factors For Stunting In Toddler

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### Abstract

*Stunting is stunted growth (low growth). Short toddlers are toddlers with nutritional status based on height according to their age (TB/U); the z-score value is less than -2 SD and very short if the z-score score is less than -3 SD. The objective of this study is to determine the factors associated with the incidence of stunting in toddlers aged 24-59 months. This research method applied an analytic survey with a cross-sectional approach. The samples in this study were toddlers aged 24-59 months, totaling 172 toddlers. The sampling technique used proportional stratified random sampling. The instruments used microtome and questionnaire. This study concludes that there is a relationship among LBW history, family economic status, maternal height, maternal education with the incidence of stunting toddlers, and there is no relationship between the accounts of exclusive breastfeeding and the prevalence of stunting toddlers. The history of LBW is a dominant factor related to the incidence of stunting of toddlers aged 24-59 months in Sidoluhur Village, Godean, Sleman.*

**Keywords:** *nutritional status, toddlers, Stunting.*

### INTRODUCTION

Stunting is stunted growth (low growth). Short toddlers are toddlers with nutritional status based on height according to their age (TB/U). The z-score is less than -2 SD and is very short if the z-score score is less than -3 SD (Kemenkes RI/ Ministry of Health, Republic of Indonesia, 2016). The occurrence of stunting in infants can cause prolonged effects, including poor health, increased risk of non-communicable diseases, poor cognitive and educational attainment achieved in childhood, as well as low efforts and productivity as adults (UNICEF, 2017). According to WHO (2017), around the world, there are 151 million children (22%) under the age of 5 years experiencing stunting. Short (stunting) prevalence in Indonesia in 2007 (36.8%), in 2010 (35.6%), in 2013 (37.2%) increased the incidence of stunting in the years 2010 to 2013. Public health problems considered as severe if the low prevalence is 30%-39% and dangerous if the low prevalence is  $\geq 40\%$  (Kemenkes, 2013). Meanwhile, data from the health profile of the Special Region of Yogyakarta (2017) show that the prevalence of stunting was as much as (13.86%). In line with the prevalence of the nutritional status of short and concise children under five, in Sleman Regency 2017, it has increased (0.18%) when compared to 2016 from (11.81%) to (11.99%) (Dinkes/Health Department of Sleman Regency, 2019). Based on the distribution of the prevalence of very short and short toddlers according to Puskesmas (Community Health Center) in Sleman Regency, the highest prevalence of stunting is in Puskesmas of Godean I which is (21.76%), and the lowest prevalence is at Puskesmas of Ngaglik which is II (4.47%) (Dinkes, Sleman District, 2019)

Based on the results of a preliminary study that was conducted at Puskesmas I Godean, it was found in the nutritional status monitoring data (PSG) of the number of children under five aged 24-59 months in the working area of Puskesmas I Godean as many as 1,072 children, then the number of children aged 24-59 months in the Sidoluhur Village totaling 303 children. Meanwhile, the number of short and very short toddlers in 2018 in the working area of Puskesmas I Godean were 188 children and quick and very short toddlers aged 24-59 in 2018 in Sidoluhur Village as many as 59 children. Low Birth Weight (LBW) is a baby weighing less than 2,500 grams and will cause the risk of mortality and impaired

growth and development of children, including the risk of being short if not appropriately handled. Also, the history of exclusive breastfeeding affects the incidence of stunting. For babies, breast milk is very influential in fulfilling its nutrition. Breast milk consumption also increases the baby's immune system in reducing the risk of infectious diseases (Kemenkes RI, 2016).

The level of education is very influential in changes in attitudes and healthy living behavior. The level of education, especially mothers, is related to childcare (Wiyono, 2016). Another factor that influences the incidence of stunting is the family's economic status. Based on research by Ni'mah and Nadhiroh (2015), family income is a factor related to the incidence of stunting in toddlers. The family's economic status influences the purchasing power of the family if the purchasing power of the family increases; the family's access to food will be better. Based on the results of research by Fitriahadi (2018), it obtained significant results between maternal height and the incidence of stunting. This research is in line with the statement by Priyono et al. (2015) that there is a relationship between maternal height and the incidence of stunting.

## RESEARCH METHOD

This type of research includes quantitative research with correlation design and using the cross-sectional approach. The sampling technique used a proportional stratified random sampling technique. The independent variables in this study were LBW history, history of exclusive breastfeeding, maternal education, maternal height, and family economic status. The dependent variable in this study is stunting. The measurement scale used a nominal range. The instrument used a questionnaire. The population in this study was 303 respondents who were children aged 24-59 months and a total sample of 172 respondents.

## RESULT

**Table 1. Respondents' Characteristics**

No	Respondents' Characteristics	Frequency	Percentage (%)
1.	Toddlers' age		
	a. 24-36 Months	65	37.8
	b. 37-48 Months	55	32.0
	c. 49-59 Months	52	30.2
2.	Toddlers' sex		
	a. Male	82	47.7
	b. Female	90	52.3
3.	Stunting		
	a. Stunting	34	19.8
	b. Normal	138	80.2
4.	LBW History		
	a. LBW	11	6.4
	b. Normal	161	93.6
5.	History of Exclusive Breastfeeding		
	a. Non-Exclusive Breastfeeding	53	30.8
	b. Exclusive Breastfeeding	119	69.2
6.	Maternal education		
	a. Low	55	32.0
	b. High	117	68.0
7.	Mothers' height		
	a. Short	20	11.6
	b. Normal	152	88.4
8.	Family Economy Status		
	a. Low	85	49.4
	b. High	87	50.6

Source: Primary Data (2019)

Based on table 1, it was found that most toddlers in the range of 24-36 months are 65 (37.8%) respondents. Based on the most sexes, it comprises of 90 (52.3%) respondents and 82 (47.7%) male respondents. Based on the stunting variable, the most normal category is 138 (80.2%), and the least in the stunting category is 34 (19.8%) respondents. Based on the LBW history variable, most toddlers with a standard weight history are 161 (93.6%), and the least toddlers with LBW history are 11 (6.4%). Based on the category of exclusive breastfeeding history, there are at most toddlers with a history of exclusive breastfeeding who are 119 (69.2%) respondents and at least not exclusive breastfeeding, who are 53 (30.8%) respondents. Based on the educational variables, it is found that the most highly educated are 117 (68.9%) respondents, and the least has low education consisting of 55 (32.0%) respondents. Based on maternal height, most are in the healthy category of 152 (88.2%) respondents and at least in the small group of 20 (11.6%) respondents.

**Table 2. Cross Distribution of LBW History with Stunting Incidence in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman**

LBW History	Stunting		Normal		Total		p-value
	F	%	F	%	F	%	
LBW (<2500 gram)	9	81.8	2	18.2	11	100	0.000
Normal (≥2500 gram)	25	15.5	136	84.5	161	100	
Total	34	19.8	138	80.2	172	100	

Source: Primary Data (2019)

Based on the results of the cross-distribution between the history of LBW and the incidence of stunting in table 2, it is known that infants who were not exclusively breastfed and suffer from stunting were as many as 9 (81.8%) toddlers, while infants who were solely breastfed experienced stunting as many as 25 (15.5%). Statistical test results using the chi-square obtained p-value ( $0.000 > 0.05$ ), then  $H_0$  is refused, and  $H_a$  is accepted, so it can be concluded that there is no relationship between the history of LBW and the incidence of stunting in toddlers.

**Table 3. Cross Distribution of Exclusive Breastfeeding History with Stunting Incidence in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman**

Exclusive Breastfeeding History	Stunting		Normal		Total		p-value
	F	%	F	%	F	%	
Non-Exclusive Breastfeeding	15	28.3	38	71.7	53	100	0.061
Exclusive Breastfeeding	19	16.0	100	84.0	119	100	
Total	34	19.8	138	80.3	172	100	

Source: Primary Data (2019)

Based on the results of the cross-distribution between the history of exclusive breastfeeding and the incidence of stunting in table 3, it is known that infants who were not exclusively breastfed suffer from stunting as many as 15 (28.3%) toddlers, while infants who were solely breastfed experienced stunting as many as 19 (16%). Statistical test results using the chi-square obtained p-value ( $0.061 > 0.05$ ), thus,  $H_0$  is accepted, and  $H_a$  is rejected, so it can be concluded that there is no relationship between the history of exclusive breastfeeding with the incidence of stunting in toddlers.

**Table 4. Cross Distribution of Maternal education with Stunting in Toddlers Age 24-59 Months in Sidoluhur Village, Godean, Sleman**

Mother's Education	Stunting		Normal		Total		<i>p-value</i>
	F	%	F	%	F	%	
Low ( $\leq$ SMP/Junior High School)	18	32.7	37	67.3	55	100	0.003
High ( $\geq$ SMA/Senior High School)	16	13.7	101	86.3	117	100	
Total	34	19.8	138	80.2	172	100	

Source: Primary Data (2019)

Based on the results of the cross-distribution between maternal education and the incidence of stunting in table 4, it is known that mothers with low education and having stunting toddlers were 18 (32.7%), while mothers with high knowledge and having stunting children were 16 (13.7%). Statistical test results using chi-square obtained p-value ( $0.003 < 0.05$ ), then  $H_0$  is rejected, and  $H_a$  is accepted, so it can be concluded that there is a relationship between maternal education and the incidence of stunting in infants.

**Table 5. Cross Distribution of Body Height of Mothers with Stunting Incidence in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman**

Maternal height	Stunting		Normal		Total		<i>p-value</i>
	F	%	F	%	F	%	
Short ( $< 150$ cm)	10	50.0	10	50.0	20	100	0,001
Normal ( $\geq 150$ cm)	24	15.8	128	84.2	152	100	
Total	34	19.8	138	80.2	172	100	

Source: Primary Data (2019)

Based on the results of the cross-distribution between maternal height and the occurrence of stunting in table 5 it is known that mothers who are short in stature have to stunt children as many as 10 (50%), while mothers whose standard height have stunting children are as many as 24 (15.8%). Statistical test results

using chi-square obtained p-value ( $0.001 < 0.05$ ), then  $H_0$  is rejected, and  $H_a$  is accepted, so it can be concluded that there is a relationship between maternal education and the incidence of stunting in infants.

**Table 6. Cross Distribution of Family Economic Status with Stunting in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman**

Family Economic Status	Stunting		Normal		Total		<i>p-value</i>
	F	%	F	%	F	%	
Low ( $< 1.701.000$ )	23	27.1	62	72.9	85	100	0.018
High ( $\geq 1.701.000$ )	11	12.6	76	87.4	87	100	
Total	34	19.8	138	80.2	172	100	

Source: Primary Data (2019)

Based on the results of the cross-distribution between the family's economic status and the incidence of stunting in table 6, it is known that families who have low financial condition and have stunting toddlers are 23 (27.1%), while families who have high economic status and have stunting children are 11 (12.6%). Statistical test results using chi-square obtained p-value ( $0.018 < 0.05$ ), thus,  $H_0$  is rejected, and  $H_a$  is accepted, so it can be concluded that there is a relationship between the economic status of the family and the incidence of stunting in toddlers.

**Table 7. Dominant factors associated with the incidence of stunting in children aged 24-59 months in the Village of Sidoluhur, Godean, Sleman**

Variable	Sig	OR	CI
LBW History	0.000	43.692	7.376 – 258.802
Maternal education	0.812	1.133	0.405-3.166
Family Economic Status	0.039	3.238	1.064-9.857
Maternal height	0.007	4.773	1.542-14.777

Based on table 7 above, the results of hypothesis testing show the variables that become the most dominant factors related to the incidence of stunting in children aged 24-59 months in Sidoluhur Village. In the working area of Puskesmas I Godean, the most dominant variable is a historical LBW variable by obtaining p-value 0.000 and OR value: 43.692 meaning that a toddler who has a history of LBW is 43.6 times stunted.

## DISCUSSION

### The Relationship between LBW History and Stunting Incidence in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman

The results of this study indicate that there are nine toddlers (81.8%) who have a history of LBW and experience stunting, and there are two toddlers (18.2%) who have an account of LBW and do not experience stunting. According to Par' i (2016), LBW is a baby born weighing less than 2,500 grams regardless of the pregnancy period. The growth of babies suffering from LBW will experience delays until the age of five and even teens.

Based on statistical test results between LBW history and stunting incidence, it obtained p-value results ( $0.000 < 0.05$ ). Hence, it can be concluded that there is a relationship between LBW history and stunting incidences in toddlers aged 24-59 months in Sidoluhur Village, Godean, Sleman. The results of this study are consistent with research conducted by Nasution (2013) that LBW since the womb has undergone intrauterine growth retardation and will continue until the next age after birth by experiencing growth and development slower than babies born normally and often fail to catch up with the level growth that should have been achieved after birth. This research is supported by the research of Lestari et al. (2018) that a history of LBW has a 12 times greater risk of stunting than babies with healthy birth weight. Moreover, it is also supported by research conducted by Supriyanto, et al. (2018) that there was a significant result between LBW and stunting, LBW infants had a six times greater risk of stunting than children of average weight.

In this study, as many as two toddlers (18.2%) who had a history of LBW did not experience stunting. It happened because the two toddlers had a high family economic status so that the child could experience growth well without lacking nutritional intake. Par' i (2016) explained that socioeconomic could affect nutritional status; someone who has a job will earn income that can be used to buy food for himself and his family. Better economic development will affect the level of food availability that will improve nutritional status, and in this study, it was found that the family's financial situation is related to the incidence of stunting in children aged 24-59 months in Sidoluhur Village, the working area of Puskesmas I Godean with a p-value ( $0.018 < 0.05$ ).

### **The Relationship between Exclusive Breastfeeding History and Stunting Incidence in Toddlers Age 24-59 Months in Sidoluhur Village, Godean, Sleman**

The results of this study indicate that 15 (28.3%) of respondents with a history of non-exclusive breastfeeding were stunted, and 38 (71.7%) of respondents with a history of not exclusively breastfeeding did not experience stunting. Statistical test results obtained a t-value of ( $0.061 > 0.05$ ), which means that statistically, there is no relationship between the history of exclusive breastfeeding and the incidence of stunting in infants aged 24-59 months in the Sidoluhur Village, Godean, Sleman.

The results of this study are in line with research conducted by Kejo et al. (2018) that exclusive breastfeeding is not a factor associated with the occurrence of stunting incidence, which can be seen from the p-value ( $0.3 > 0.05$ ). Another study conducted by Setiawan, et al. (2018) stated that the status of exclusive breastfeeding is not related to the incidence of stunting obtained p-value ( $0.464 > 0.05$ ) and confirmed by research conducted by Mardani et al. (2015) that exclusive breastfeeding is not related to the incidence of stunting of p-value ( $0.45 > 0.05$ ). It is caused by the state of stunting not only determined by factors of exclusive breastfeeding status but also related to other factors, which are LBW history, maternal education, maternal height, and family economic status.

### **The Relationship between Maternal Education and Stunting in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman**

The results of this study found 18 (32.7%) mothers with low education had stunting toddlers, and 37 (67.3%) mothers with low education did not have stunting toddlers. Based on statistical tests obtained p-value results ( $0.003 < 0.05$ ), it can be concluded that there is a relationship between maternal education and the incidence of stunting in children aged 24-59 months in Sidoluhur Village, Puskesmas I Godean Work Area.

According to Suparisari (2016), education, in a broad sense, covers all life processes and all forms of individual interaction with the environment, both formally and informally. The core of educational activities is the teaching and learning process. The results of the teaching and learning process are a set of behavioral changes. This study is in line with the research conducted by Fikrina (2017) that there is a significant relationship between maternal education and the incidence of stunting. Mothers who have in-

depth knowledge who are  $\leq$ SMP are at risk of having stunted children compared to mothers with high education  $\geq$ SMA.

Wiyono (2016) stated that institutional factors play an essential role in determining the quality of growth and development of children. The level of education is very influential in changes in attitudes and behavior in clean and healthy living. The level of education, especially mothers, is related to childcare. Formal education is one of the mothers' ways of obtaining necessary arrangements for behavior and action. Educated families will have the ability to take advantage of health care facilities so that the family is more accessible for nutrition.

Torlesse et al. (2016) found the results of research that maternal education is a significant factor with the incidence of stunting with a rate of p-value 0.001. In line with research by Manggala et al. (2018), maternal education is a significant factor for the stunting incidence in infants. Setiawan et al. (2018) stated that maternal education is the most dominant factor (OR 10.5) with the rate of stunting in children. Education level has an influence on health, one of which is nutritional status. Individuals who have a high level of education are more likely to know a healthy lifestyle and how to keep the body fit, which is reflected from the application of a healthy lifestyle such as consumption of a nutritious diet.

### **The Relationship between Maternal Height and Stunting Incidence in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman**

The results of this study found 10 (50%) respondents who were short had stunting toddlers, and 10 (50%) respondents who have average height had healthy toddlers. Based on statistical test results between maternal height and stunting, p-value results ( $0.001 < 0.05$ ) show that there is a relationship between maternal height and stunting in toddlers aged 24-59 in Sidoluhur Village, Godean, Sleman. Manggala supports this research et al. (2018) that maternal height is related to stunting as evidenced by the p-value ( $0.004 < 0.05$ ) and supported by Hapsari (2018) which stated that maternal height is a genetic expression, and is a hereditary factor to children as well as related to stunting incidence. This study is also in line with research by Kusumawati et al. (2017) that the dominant factor causing stunting is maternal height, children whose mothers are short (height  $< 150$  cm) have a risk of 2.28 times more stunting than those whose mothers are average height ( $\geq 150$  cm).

### **The Relationship between Family Economic Status and Stunting in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman**

The results of this study found 23 (27.1%) families who have a low economic status to have stunting children. Statistical test results between the financial situation of the family and stunting obtained the p-value ( $0.018 < 0.05$ ), it can be concluded that there is a relationship between the economic status of the family with the incidence of stunting in children aged 24-59 months in the Sidoluhur Village, Godean, Sleman. Par' i (2016) explained that socioeconomic could influence nutritional status. Someone who has a job will earn income that can be used to buy food for himself and his family. The better economic development will affect the level of food availability, which will improve nutritional status. This study is in line with research by Pacheco, et al. (2017), which obtained significant results between the economic situation of families and the incidence of stunting and is supported by research by Kusumawati et al. (2015) that low income can increase the risk of stunting three times greater. Low family income has an impact on the amount and quality of food consumed because of insufficient money to buy food. Rohmah (2017) confirmed that low economic status is associated with stunting. Someone who has a financial income less than the local district minimum wage is more at risk of being stunted.

### **Dominant Factors Related to Stunting in Toddlers Aged 24-59 Months in Sidoluhur Village, Godean, Sleman**

Based on the results of the bivariate analysis of the chi-square test, it is known that variables of LBW history, maternal education, maternal height, and family economic status are factors related to the incidence of stunting, whereas the history of exclusive breastfeeding is not a factor associated with the prevalence of stunting. Then, it proceeded to multivariate analysis, and it was found the results that the biggest dominant factor related to the incidence of stunting in children aged 24-59 months in the Sidoluhur Village, Godean, Sleman is a history of LBW with a p-value of 0.000 and an OR value: 43,629 which means toddlers who have a history of LBW have a chance of 43.6 times stunted.

This is in line with the research of Manggala et al. (2018) in multivariate analysis; it was found that LBW is a dominant factor in the occurrence of stunting. It is evidenced by the statistical results of p-value 0.047 and OR: 5.092 and supported by research by Nasution (2013) which stated that LBW since in the womb has experienced growth retardation intrauterine and will continue until the next age after birth that is experiencing growth and development slower than babies born normally and often fails to follow the level of growth that should be achieved at the age after birth. Another study by Lestari et al. (2018) showed that LBW history had a 12 times greater risk of stunting than babies with average birth weight.

Kramer (2015) stated that the malnutrition problem begins with slowing or retarding fetal growth known as IUGR (Intra-Uterine Growth Retardation). In developing countries, malnutrition in pre-pregnancy and pregnant women has an impact on the birth of a child who is IUGR and Low Birth Weight (LBW). In line with research by Supriyanto, et al. (2018), it obtained significant results between LBW and stunting incidence, and LBW was six times more likely to experience stunting than children who have average birth weight.

## CONCLUSION

Based on the results of the study, it can be concluded that: There is a relationship between LBW history, maternal education, maternal height, and the family's economic status with stunting incidence in toddlers aged 24-59 months. There is no relationship between the history of exclusive breastfeeding with the rate of stunting in children aged 24-59 months. The dominant factor related to the incidence of stunting in infants aged 24-59 months is the history of LBW with a p-value of 0.000 and an OR (odds ratio) value of 43.69.

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