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Determinants of Stunting Incidents in Dolok Tolong Village, Sumbul District, Dairi Regency in 2022

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Keywords

Exclusive breastfeeding, family income, education, height and parity

Abstract. Stunting is one of the problems currently being faced by Indonesia. Stunting is a problem of malnutrition caused by a lack of adequate intake over a long period of time which will cause difficulties in achieving optimal physical and cognitive development in the future, which is indicated by the value z-score Height/Length by Age less than -2SD. The incidence of stunting is influenced by various factors, namely history of exclusive breastfeeding, family income, maternal education, maternal height and parity. The general objective of this research is to determine the determinants of stunting events in Dolok Tolong Village, Sumbul District, Dairi Regency in 2022. The type of research used is observational comparative study research, the research method is a survey with a case control approach where research is carried out by comparing two groups of cases. and control group. The population in this study were all mothers who had toddlers who were not stunted and experienced stunting in Dolok Tolong Village. The population of children under five who are stunted is 67 people and 67 people who are not stunted. Based on the research results, it was found that there was a relationship between a history of exclusive breastfeeding and stunting (ρ-value = 0.000), there was a relationship between family income and stunting (ρ-value = 0.001), there was a relationship between maternal education and stunting (ρ-value = 0.029), there was a relationship between parity and stunting (ρ-value = 0.000), there was a relationship between maternal height and stunting (ρ-value = 0.000). The factor most associated with stunting in this study was maternal height, with Ods Ratio=5.9762. There is a need to increase health promotion and education to the public about the importance of good parenting patterns and fulfilling nutrition, especially in the first 1000 days of life, starting from when mothers are pregnant until children are 2 years old. Interventions during the first 1000 days of life are urgently needed to prevent stunting as a result of the intergenerational cycle of malnutrition.

1. INTRODUCTION

Stunting is one of the problems currently faced by Indonesia. Stunting is a problem of malnutrition caused by a lack of adequate intake over a long period of time which can cause difficulties in achieving optimal physical and cognitive development in the future. Stunting is also an illustration of an activity that has long been carried out by the community in consuming low quality nutrition. This low nutritional consumption can be caused by low maternal knowledge, inadequate levels of nutritional intake and a history of illness and birth weight (Setiawan, 2018).

Nutrition is an important factor in maintaining the immune system. Body cells will be able to function optimally if the fulfillment of nutritional needs is met properly. The immune system is a condition that the body needs to resist certain diseases, especially preventing pathogenic microorganisms from developing so as to ward off the bad effects that will occur on the body (Nawangwulan, 2020). Health development is an effort made by all components of society to increase awareness of healthy living. One way to improve health status is by improving the nutritional status of the community, especially for toddlers.

In infancy the development of language skills, creativity, social awareness, emotional, and intelligence runs very fast and is the basis for further development. Toddlers are among the groups most vulnerable to nutritional problems when viewed from the point of view of health and nutrition issues, whereas during this period toddlers experience relatively rapid cycles of growth and development. The impact of malnutrition will lead to vulnerability to various infectious diseases. Malnutrition can inhibit growth and development so that growth and development are not always ideal or are often called short stature. The World Health Organization (WHO) estimates that 165

million children under the age of 5 in the world are affected by malnutrition. One of them is the failure of linear growth or stunting.

Stunting will have an impact on the quality of human resources (HR). In the short term, stunting causes failure to thrive, barriers to cognitive and motor development, and suboptimal physical body size and metabolic disorders. In the long term, stunting causes a decrease in intellectual capacity. Disorders and functions of nerves and brain cells that are permanent and cause a decrease in the ability to absorb lessons at school and will affect their productivity as adults. In addition, stunting also increases the risk of non-communicable diseases such as diabetes mellitus, hypertension, coronary heart disease and stroke (Ministry of National Development Planning/Bappenas, 2018a).

Data from the 2021 Indonesian Nutritional Status Study (SSGI) shows that the national stunting rate has decreased by 1.6% every year. This decrease was obtained from 27.7% in 2019 to 24.4% in 2021. Even so, this figure is still above the standard tolerated by the World Health Organization (WHO), which is below 20%. The prevalence of stunting in North Sumatra Province is above the national figure, namely 25.8%. Likewise, the prevalence of stunting in Dairi Regency is around 34.2% (SSGI, 2021). Data from the Population and Family Planning Agency (BKKBN) states that 13 of the 33 districts/cities in North Sumatra have red status, meaning they have a stunting prevalence above 30%. Mandailing Natal with a stunting prevalence of 47.1% topped the number 2 ranking out of 246 regencies/cities in 12 priority provinces based on SSGI 2021 data. Meanwhile, Padanglawas, with a prevalence of 42%, is included in the top 10 areas with red status.

The red status, apart from being carried by Mandailing Natal and Padang Lawas, also includes Pakpak Bharat, South Nias, North Nias, Dairi, North Padang Lawas, Nias, Padangsidempuan City, Langkat, Batubara, North Labuan Batu and South Tapanuli. While those with yellow status or those with a prevalence of stunting in the range of 20 to 30 percent include Samosir, Simalungun, West Nias, Labuan Batu, South Labuhan Batu, North Tapanuli, Humbang Hasundutan, Gunung Sitoli City, Tanjung Balai City, Sibolga City, Central Tapanuli, Karo, Toba Samosir, and Binjai. To be precise, there are 14 areas with yellow status in North Sumatra. Green status areas that have a stunting prevalence in the range of 10 to 20 percent include 6 areas. The six consist of Serdang Bedagai, Medan City, Asahan, Tebing Tinggi City. Based on the North Sumatra Province Nutritional Status Monitoring Survey Report, in Dairi Regency the prevalence of nutritional status (PB/U) in children aged 0-23 months (Baduta) according to districts/cities in North Sumatra Province is 17.49% and the prevalence of nutritional status (BB /PB) in children aged 0-23 months (Baduta) are thin by 8.29% (Riskesdas, 2018).

Dairi Regency as one of the regions in North Sumatra, has a working area consisting of 15 Districts and 18 Health Centers. The number of children under five with severe nutritional status as of August 2021 is 158 children under five, while in 2020 there were 229 children under five. From the results of the analysis of measuring and weighing toddlers, the prevalence of stunting in Dairi Regency has decreased from previously 39.27% in 2019, and 18.35% in 2020, to 15.13% in 2021 based on the electronic nutrition recording and reporting system community-based (e-PPGBM). Based on the results of an initial survey conducted according to toddler data entry in the e-PPGBM application for August 2022, the prevalence of stunted toddlers (based on toddler length/height and age) at the Pegagan Julu II Health Center in Sumbul District is around 25.08. Dolok Tolong Village is one of the villages in the Pegagan Julu II Health Center area which contributes the highest stunted rate, namely 37.63%. In addition, in accordance with the Decree of the Dairi Regent Number 796/444/XI/2020 concerning Determination of Intervention Focus Locations, Implementing Regional Organizations and Description of Dairi Regency Integrated Stunting Reduction Activities for 2021-2024 shows that Dolok Tolong Village, which is in Sumbul District, is one of the stunting locus area in Dairi Regency.

The results of interviews with 10 mothers revealed that mothers of toddlers who have stunted toddlers (80%) on average have low education, lack knowledge about nutrition, low income levels, have more than 3 children and do not/do not provide breast milk. exclusive. Several previous studies have shown factors related to stunting. In previous research on the relationship between exclusive breastfeeding and reducing stunting in children aged 6 to 23 months in Sosor Lontung Village,

Siempat Nempu District, Dairi Regency in 2019, stunting occurred more frequently in children who did not receive exclusive breastfeeding compared to children who were given breast milk. Exclusive breastfeeding. Exclusive breastfeeding reduces the risk of stunting. On the other hand, children who are not exclusively breastfed have a greater chance of stunting, where out of 22 respondents, 50% are stunted. This is proven by the Chi-Square test results $p = 0.037$, which means that exclusive breastfeeding can influence the absence of stunting (0.037 = < 0.05. In other words,

Research conducted in Surabaya shows that families in the normal toddler group tend to have sufficient income (50%) compared to families of stunted toddlers (23.5%). The results of Chi Square analysis show that family income is a factor related to the incidence of stunting in toddlers (p=0.044) with an OR of 3.250 (Ni'mah and Nadhiroh, 2015). The mother's level of knowledge is one of the factors in meeting the nutritional needs of the family, especially children. Research conducted in Surabaya showed that mother's education was a factor related to the incidence of stunting in toddlers (p=0.029) with an OR of 3.378 ((Ni'mah and Nadhiroh, 2015). Mothers with multiple parities tend to have children who experience stunting, especially those with less economic conditions because they are limited in terms of providing adequate attention and food to all of their children. Research in Kendari in 2016 stated that parity was a risk factor for stunting (OR=3.25; 95% CI=1.428-8.305). Likewise, the mother's height is the determinant that has the greatest influence on the incidence of stunting (OR=2.4; 95% CI=1.131-5.371) (Palino & Majid, 2016). Therefore, it is very important to research further on the factors that contribute to the prevalence of stunting in the region, so that more effective intervention efforts can be designed and implemented to address this problem.

2. METHOD

The type of research used is observational comparative study research using survey research methods with a Case Control approach, where research is carried out by comparing two groups of cases and a control group. The case group consisted of 67 mothers who had stunted toddlers, while the control group consisted of 67 mothers who had non-stunting toddlers. This study was conducted in Dolok Tolong Village, which is one of the villages in the Pegagang Julu II Health Center area in Sumbul District, Dairi Regency. The selection of this location was based on the high prevalence of stunting in Dolok Tolong Village, which reached 37.63%, which makes it one of the areas with the highest stunting rate in Dairi Regency. This research involved all mothers who had toddlers who were stunted and who were not stunted in Dolok Tolong Village; There were 67 toddlers who experienced stunting, and the number of samples of mothers who experienced stunting in this study were 67 people. Thus, the number of control samples is the same as the population studied.

Method of collecting data

Primary data were obtained from questionnaires filled out by respondents, which included data on exclusive breastfeeding history, family income, mother's education, parity, and mother's height. Secondary data was obtained from searching documents or reports from Dolok Tolong Village and the Pegagang Julu II Health Center, Sumbul District, Dairi Regency. Tertiary data was obtained through literature searches, as well as from published journals and internet sources such as government regulations and laws.

Zaidar's (2021) research used a questionnaire that was tested for validity and reliability; The results of the reliability test show that the questionnaire is reliable with Crombach's alpha values ranging between 0.764 and 0.772. Descriptive data analysis involves the description of each variable which is tabulated to see the distribution of frequencies in the respondent's data. This involves the distribution of the mean, median, minimum, and maximum values. Distribute the results in text, tabular, or graphic format. Bivariate analysis was carried out with the aim of knowing how the variables studied interact with each other. Due to the scale of the ordinal independent variable data, this analysis was performed with the Chi Square test. With a 95% degree of confidence, decision making is considered to have a relationship if the p value <0.05 and Ho is rejected. How big the influence is between the independent variable and the dependent variable is known as multivariate. Because this research uses an ordinal scale for the dependent and independent variables,

Table1 Operational Definitions and Measurement Aspects

Variable	Operational definition	Tool* Measuring	Method* Measuring	Results Measuring	Measure Scale
Dependent					
stunt	Determining stunting in toddlers is done by measuring height with a microtoise with an accuracy of 0.1 cm. Furthermore, these toddlers will be compared for their height according to age and sex based on anthropometric standards (Permenkes No 20 of 2020). If the z score for height for a toddler's age is lower than -2 SD then the toddler is considered stunted, but if the toddler is greater than -2 SD to +3 SD, then the toddler is considered not stunted.	Microtoice with an accuracy of 0.1 cm	Measure Height	1. Stunting < -2 SD 2. Normal-2 SD to +3 SD	Ordinal
INDEPENDENT					
Breastfeeding	Exclusive breastfeeding is giving breast milk to babies from birth to 6 months of age without providing any additional food.	Questionnaire	Interview	1. Less, if Score (< 55%). 2. Enough, if Score (56%-75%). 3. Well, if Score (76% - 100%).	Ordinal
Family Income	Family income is the amount received by the family in return for the results of one month's hard work in the form of money to meet the family's daily needs based on the North Sumatra Province Drinking Wage, namely Rp. 2,522,609,-	Questionnaire	Interview	1. Low<Rp. 2,500. 000,- 2. Height ≥Rp. 2.500.000,-	Ordinal
Mother's Education	Maternal education is the level of formal education taken by mothers as a provision to be able to educate their children well and correctly.	Questionnaire	Interview	1. Low, if mother's education ≤ junior high school 2. High, if the mother's education > junior high school	Ordinal

Parity	Parity is the number of births in the family of mothers under five	Questionnaire	Interview	1. ≤ 3 children 2. > 3 children	Ordinal
Mother's Height	Mother's height, namely the height of the mother under five as measured using a height measuring device.	microtoise to the nearest 0.1 cm	Measure Height	1. Short (<150 cm) 2.Normal (≥150cm)	Ordinal

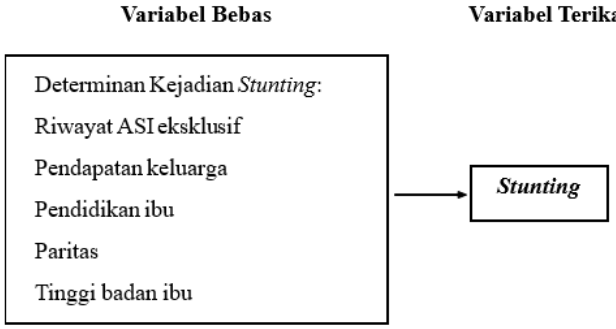

Figure 1. Research Conceptual Framework

The independent variables in this study consisted of history of exclusive breastfeeding, family income, mother's education, parity, mother's height, while the dependent variable was stunting. The hypothesis proposed in this research is:

1. There is a relationship between a history of exclusive breastfeeding and stunting in Dolok Tolong Village, Sumbul District, Dairi Regency in 2022.
2. There is a relationship between family income and stunting in Dolok Tolong Village, Sumbul District, Dairi Regency in 2022.
3. There is a relationship between maternal education and stunting in Dolok Tolong Village, Sumbul District, Dairi Regency in 2022.
4. There is a parity relationship with stunting in Dolok Tolong Village, Sumbul District, Dairi Regency in 2022.
5. There is a relationship between mother's height and stunting in Dolok Tolong Village, Sumbul District, Dairi Regency in 2022.

3. RESULTS AND DISCUSSION

Characteristics of Respondents

Respondent characteristics consist of mother's age, mother's occupation, and child's sex

Table 2. Frequency Distribution of Respondent Characteristics in Dolok Tolong Village (n=67)

No	Characteristics of Respondents	Case		Control	
		f	%	f	%
1	**Mother's age**				
	Early Adulthood (20-39 years)	60	89.6	65	97.0
	Middle Adult (> 40)	7	10.4	2	3.0
	Total	67	100.0	67	100.0
2	**Mother's job**				
	IRT	13	19.4	15	22.4
	Farmer	53	79.1	50	74.6
	civil servant	1	1.5	2	3.0
	Total	67	100.0	67	100.0
3	**Gender of Child**				
	Man	31	46.3	44	65.7
	Woman	36	53.7	23	34.3
	Total	67	100.0	67	100.0

Table 2 shows that the case group has the majority of respondent characteristics, with early adulthood at 89.6%, farmer occupation at 79.1%, and female gender at 53.7%. In contrast, the control group had the majority of respondents' characteristics, with early adulthood at 97.0%, farmer occupation at 74.6%, and male gender at 65.7%.

Table 3 Frequency Distribution of Exclusive Breastfeeding History in Case and Control Groups in Dolok Tolong Village (n=67)

Exclusive breastfeeding	Case		Control	
	f	%	f	%
Not enough	8	12.0	1	1.4
Enough	29	43.2	21	31.4
Good	30	44.8	45	67.2
Total	**67**	**100.0**	**67**	**100.0**

According to Table 3, the majority of respondents from the case group had a good history of exclusive breastfeeding, 44.8%, while the control group had a good history of exclusive breastfeeding, 67.2%.

Table 4. Frequency Distribution of Family Income in the Case and Control Groups in Dolok Tolong Village (n=67)

Family Income	Case		Control	
	f	%	f	%
Low	53	79.1	34	50.7
Tall	14	20.9	33	49.3
Total	**67**	**100.0**	**67**	**100.0**

Table 4 shows that the majority of respondents in the case group had a low income of 79.1% and a high income of 20.9%, while the control group had a high income of 50.7% and a low income of 49.3%.

Table 5. Frequency Distribution of Mother's Education in Dolok Tolong Village (n=67)

Mother's Education	Case		Control	
	f	%	f	%
Low	23	34.3	11	16.4
Tall	44	65.7	56	83.6
Total	**67**	**100.0**	**67**	**100.0**

Table 5 shows that 35.8% of respondents in the case group and 83.6% in the control group had higher education.

Table 6 Frequency Distribution of Maternal Parity in Dolok Tolong Village (n=67)

Parity	Case		Control	
	f	%	f	%
≤ 3 children	19	28.4	49	73.2
>3 children	48	71.6	18	26.8
Total	**67**	**100.0**	**67**	**100.0**

The majority of respondents in the case group had parity of more than 3 children, 71.6%, while the control group had parity of less than 3 children, 73.2%.

Table 7. Frequency Distribution of Maternal Height in Dolok Tolong Village (n=67)

Mother's Height	Case		Control	
	f	%	f	%
Short	54	90.3	3	2.2
Normal	13	9.7	64	97.8
Total	**67**	**100.0**	**67**	**100.0**

Table 7 shows that 90.3% of respondents in the case group have short height, while 97.8% of respondents in the control group have normal height.

A. Bivariate Analysis

Table 8 Relationship between history of exclusive breastfeeding and stunting in Dolok Tolong Village

Breastfeeding	Toddler height				Total		α	*ρ-value*
	stunt		Normal					
	F	%	f	%	f	%		
Not enough	8	12.0	1	1.4	9	6.7	0.05	0,000
Enough	29	43.2	21	31.4	50	37.3		
Good	30	44.8	45	67.2	75	56.0		
Total	**67**	**100.0**	**67**	**100.0**	**134**	**100.0**		

Of the 67 people who answered who had a history of exclusive breastfeeding, Table 8 shows that there were 44.8% of children with stunting and 67.2% of children with normal nutritional status. Based on chi square analysis, the p-value is 0.000 < α = 0.05, so it can be concluded that there is a relationship between the history of exclusive breastfeeding and stunting in Dolok Tolong Village.

Table 9 Relationship between Family Income and Stunting in Dolok Tolong Village

Family Income	Toddler height				Total		α	*ρ-value*
	stunt		Normal					
	F	%	f	%	f	%		
Low	53	79.1	34	50.7	87	64.9	0.05	0.001
Tall	14	20.9	33	49.3	47	35.1		
Total	**67**	**100.0**	**67**	**100.0**	**134**	**100.0**		

Table 9 shows that of the 67 respondents with low family income, there were 79.1% of children with stunting and 50.7% of children with normal nutritional status. Based on the chi-square analysis, the p-value is 0.001 < α = 0.05, so it can be concluded that there is a relationship between family income and stunting in Dolok Tolong Village.

Table 10 Relationship between Mother's Education and Stunting in Dolok Tolong Village

Mother's Education	Toddler height				Total		α	*ρ-value*
	stunt		Normal					
	F	%	f	%	f	%		
Low	23	34.4	11	16.4	34	25.3	0.05	0.029
Tall	44	65.6	56	83.6	100	74.7		
Total	67	100.0	67	100.0	134	100.0		

Table 10 shows that of the 67 respondents who received higher maternal education, there were 65.6% stunted children and 83.6% children with normal nutritional status. Based on chi square analysis, p-value 0.029 < α = 0.05, so it can be concluded that there is a relationship between maternal education and stunting in Dolok Tolong Village.

Table 11 Relationship between Parity and Stunting in Dolok Tolong Village

Parity	Toddler height				Total		α	*ρ-value*
	stunt		Normal					
	F	%	f	%	f	%		
≤ 3 children	19	28.4	49	73.2	68	50.7	0.05	0,000
>3 children	48	71.6	18	26.8	66	49.3		
Total	**67**	**100.0**	**67**	**100.0**	**134**	**100.0**		

Of the 67 respondents with parity of more than 3 children, Table 11 shows that 71.6% of the respondents have stunting and 26.8% have normal nutritional status. Based on quadratic analysis, the

p-value is 0.000 < α = 0.05, so it can be concluded that there is a relationship between parity and stunting in Dolok Tolong Village.

Table 12 Relationship between Maternal Height and Stunting in Dolok Tolong Village

Mother's Height	Toddler height				Total		α	*ρ-value*
	stunt		Normal					
	F	%	f	%	f	%		
Short	54	80.6	3	4.4	57	42.5	0.05	0,000
Normal	13	19.4	64	95.6	77	57.5		
Total	**67**	**100.0**	**67**	**100.0**	**134**	**100.0**		

Of the 67 people surveyed, short maternal height was 80.6% in the stunting group and 4.4% in the normal group, according to Table 12. Based on chi square analysis, a p-value of 0.000 < α = 0.05 was obtained, so it can be concluded that there is a relationship between maternal height and stunting in Dolok Tolong Village.

Selection of candidate variables

The selection of candidates included in the multivariate analysis was through selection in the bivariate analysis which had a p value <0.25.

Table 13 Model Feasibility Test Results

N	Variable	P-value	Information
1	History of exclusive breastfeeding	0,000	Eligible to Enter the Logistic Regression Model
2	Mother's education	0.001	Eligible to Enter the Logistic Regression Model
3	Family Income	0.029	Eligible to Enter the Logistic Regression Model
4	Parity	0,000	Worthy of Entering the Model Logistic Regression Worthy of Entering the Model
5	Mother's Height	0,000	Logistic Regression

Table 14. Logistic Regression Test Results

	B	df	Sig.	OR	95.0%CI	
					Lower	Upper
Breastfeeding	-0.457	1	0.393	0.633	0.222	1,807
Family Income	-0.692	1	0.263	0.501	0.149	1,682
Mother's Education	-1,059	1	0.189	0.347	0.072	1,681
Mother Parity	0.966	1	0.094	2,627	0.849	8,125
Mother's Height	4,090	1	0,000	5,976	1,399	25,528

Table 14 shows that the most significant variable related to stunting in Dolok Tolong Village is maternal height (p-value 0.005 < α = 0.05), with an Ods ratio (Exp. B) of 5.976, which indicates that mothers with low height have 5.9 times more stunted children than mothers of normal height.

Discussion

The Relationship between a History of Exclusive Breastfeeding and Stunting in the Village of Dolok Tolong The results of research in Dolok Tolong Village show a relationship between a history of exclusive breastfeeding and stunting (ρ-value = 0.000). This is shown by the fact that the majority of mothers with stunted toddlers have a history of adequate exclusive breastfeeding, 44.8%, while mothers with normal toddlers have a good history of exclusive breastfeeding, 67.2%. This shows that the risk of stunting increases if exclusive breastfeeding is given in minimal quantities and replaced with exclusive breastfeeding.(Renyoet et al., 2016).

The results of a study conducted by Khoirun and Nadhiroh (2015) showed a relationship between exclusive breastfeeding and the incidence of stunting (p-value = 0.025), which showed that toddlers who did not receive exclusive breastfeeding during the first six months were more likely to experience stunting as much as 88.2% . The same research was also conducted by Handayani in 2019 found a relationship between exclusive breastfeeding and the incidence of stunting in toddlers in the United States. (Handayani et al., 2019).

This is also in line with research conducted in 2019 in Sosor Lontung Village, Siempat Nempu District, Dairi Regency, which found that children who did not receive exclusive breastfeeding experienced stunting more often than children who received exclusive breastfeeding. Of the 22 people who answered, half experienced stunting. Chi-Square test results p = 0.037 indicate that exclusive breastfeeding can influence the absence of stunting (0.037 = 0.05). In other words, exclusive breastfeeding reduces the possibility of stunting.

One way to prevent stunting in toddlers is to provide attention and support to mothers who can breastfeed exclusively. This can be done from the time the mother is pregnant to the exclusive breastfeeding program by providing clear information so that the mother can understand and understand it. In addition, family members are educated about the importance of exclusive breastfeeding for toddlers. This is done so that this program can be successful for the child's health and allows the baby to grow and develop well (Sulistyoningsih, 2020).

Exclusive breastfeeding is very important for the growth and development of toddlers, especially when they grow taller. This is because breast milk has a higher calcium content than formula milk which is sold freely in the community. Breast milk also helps absorb calcium better than formula milk. Likewise, the nutritional content of breast milk is very good so that it can meet nutritional needs for growth and development.

Providing exclusive breast milk to babies until they are six months old is one of the special actions in the First 1000 Days of Life. Compared with other populations, babies who start breastfeeding early and receive exclusive breast milk have higher IQs. Therefore, the country's competitiveness will be increased by encouraging early and exclusive breastfeeding. Babies who only receive breast milk from birth to the age of six months have the guarantee to have the best health status throughout their lives until adulthood and parents. Babies are protected from respiratory infections, diarrhea and other dangerous diseases by exclusive breastfeeding. Breastfeeding also fulfills all the needs for healthy growth and optimal brain development (BKKBN, 2017).

Relationship between family income and stunting. Stunting in Dolok Tolong Village.

The results of research in the village of Dolok Tolong show a relationship between family income and stunting (ρ-value = 0.001). This can be seen from the fact that mothers with stunted toddlers have a low income of 79.1% and mothers with normal toddlers have a high income of 49.3%. In addition, Nadhiroh's 2015 research found a relationship between family income and stunting (ρ-value = 0.044). In addition, research conducted by Maulidah in 2019 shows that there is a relationship between stunting and economic status. This shows that families with low economic status are 4.8 times more likely to have stunted children compared to families with high economic status. Families with high incomes may be better able to meet their food needs. On the other hand, families with limited income may be less able to meet their needs, especially those related to nutrition (Kristianti, 2015). Therefore, the level of family income affects the incidence of malnutrition in people whose income is below the Minimum Wage.

In this research, it can be assumed that there is a relationship between the level of stunting and family income. One of the obstacles for low-income families is that they cannot afford the necessary food ingredients. Therefore, the lack of family income affects the purchasing power of families for food, which has an impact on the nutritional status of children, both stunted and normal. This is especially true for toddlers because they need a lot of nutrition for their growth and development.

The Relationship between Mother's Education and Stunting in Dolok Tolong Village.

The results of research in Dolok Tolong Village show a relationship between mother's education and toddler stunting (ρ-value = 0.029). This is shown by the fact that the majority of mothers with stunted toddlers have a high education level of 65.6 percent and mothers with normal toddlers have a high education level of 83.6 percent. A study conducted by Khoirun (2015) showed that maternal education was a factor related to the incidence of toddler stunting (ρ-value = 0.029).

A person's knowledge, attitudes, and actions can be influenced by their level of education. Poor mother education can affect how children are raised and cared for, and how they select and serve their food. Mothers who do not receive adequate education, among other things, will face difficulties understanding information about proper nutrition, which increases the possibility of their children experiencing stunting (Atikah, 2014).

Mothers who have higher education have broader knowledge about how to care for children and keep their environment clean (El Taguri et al., 2009). Mothers who are highly educated are better able to make decisions that will improve the health and nutrition of their children (Suhardjo, 2003). In addition, the mother's education level influences how easily nutritional knowledge is provided to the mother. This can be used as a basis for determining the most appropriate extension approach. For the benefit of family nutrition, education is needed so that someone, especially mothers, is more aware of nutritional problems and can take immediate action (Suhardjo, 2003).

In this study, it can be assumed that there is a relationship between stunting and the mother's education level. This has an impact on the mother's ability to choose and provide food for her child. Mother's nutritional knowledge can help improve the nutritional status of toddlers by providing the right ingredients and menus for them. Among other things, mothers who do not receive adequate education will face difficulties absorbing information about proper nutrition, which increases the risk of stunting in their children. Someone with a high level of education is easier to absorb and practice knowledge in everyday life.

The Relationship between Parity and Stunting in Dolok Tolong Village

The research results show that there is a relationship between parity and stunting. Stunting in Dolok Tolong Village (ρ-value = 0.000) This can be seen from the fact that the majority of mothers with stunted toddlers have parity of more than three children, as much as 71.6%, and mothers with normal toddlers have parity of less than three children, as much as 73.2%. A study conducted by Palino and Majid (2016) found that toddlers with mothers with multiple parities had a 3.25 times greater risk of experiencing stunting (ρ-value = 0.0029).

Parity contributes indirectly to stunting because it is closely related to parenting patterns and meeting children's nutritional needs, especially in inadequate economic situations. Children born to mothers with parity tend to have a higher tendency to experience unhealthy parenting and not receive the necessary amount of nutrition during their growth period. Children with many siblings can experience growth delays due to a lot of competition at home for nutritional resources (Sulistyoningsih, 2020).

Too many children not only make life more difficult to take care of, but also not enough to create a calm atmosphere at home. A family environment that is always contentious will disturb the peace of mind, and this will directly reduce the desire to eat of other family members who are too sensitive to unpleasant conditions. If there are many family members and the family income is low, equitable distribution of food is less guaranteed because family members do not meet their nutritional needs, making them vulnerable to disease (Dalimunthe, 2015).

Children who are growing, especially during a period of rapid growth such as those aged 1-2 years, really need stimulation and attention for their brain development. They also need adequate nutrition for their physical and mental growth. Because the burden borne by parents increases with the number of children they have, children born later tend to experience growth and development problems (Candra, 2013). In this study, it can be assumed that mothers with parity have a greater tendency to have children with stunting. Families with many children, especially those with less economic resources, will not be able to provide enough attention and food for all their children.

Relationship between maternal height and stunting in Dolok Tolong Village

The results of the study showed that there was a correlation between the height of the mother in Dolok Tolong Village and stunting (ρ-value = 0.000). This can be seen from the fact that the majority of mothers with normal toddlers have a normal height of 95.6 percent, while mothers with stunting have a short height of 80.6%, according to research by Narsikhah (2012). In addition, research in Cambodia shows that there is a correlation between stunting and maternal height (Downs et al., 2013).

Mothers with short height are more at risk of having stunted children if one or both parents have short height due to pathological conditions or genes that carry the trait of being short. Inheriting a gene that carries this short trait can cause children under five to grow up short or stunted (Downs et al., 2013). The results of this study can show that children under five whose mothers are short are more at risk (Downs et al., 2013). The mother's nutritional status is indicated by her short height. Mothers with short height have a higher risk of having stunted children. This can occur because one or both parents grow shorter due to a pathological condition.

Many factors, both internal and external, influence parents' height. Internal factors such as genetics, while external factors such as disease and nutritional intake from an early age. Genetic factors are factors that cannot be changed, while external factors are factors that can be changed. This means that if parents are short because the genes on their chromosomes carry the trait of shortness and are passed on to their offspring, stunting is difficult to treat. However, if the parents are short due to illness or inadequate nutritional intake from an early age, this should not affect the height of the child or their offspring. Children can still have normal height if they are not exposed to other risk factors.

Variables Most Associated with Stunting Incidents in Dolok Tolong Village

The results of multivariate analysis showed that maternal height was the determinant factor with the greatest influence on the incidence of stunting, with an OR of 5.976 and a 95% confidence interval between 1.399 and 25.528. This result is in line with Palino's study (2017), where the mother's height has the greatest influence on the incidence of stunting with an OR of 2.4. In addition, Margawati's research (2012) found that maternal height under 150 cm was the most influential factor in the incidence of stunting in toddlers aged 24-36 months at the Dasan Agung Community Health Center, with an OR of 10.31 and a 95% confidence interval between 1, 93-55.02.

Maternal height is a risk factor for stunting. One of the genetic factors that is passed from parent to child is the mother's height. Genetic factors are the key to achieving the final results of a child's growth and development process. The genetic instructions contained within the fertilized egg make it possible to determine the quality and quantity of growth. According to Soetjiningsih (2014), this is in line with the opinion of Supariasa (2012) who states that height is a type of genetic expression and is a component that is passed on to children and is related to stunting. Children with short parents, either one or both, are at greater risk of stunting than children with parents of normal height.

Maternal height before pregnancy indicates nutritional status and environmental exposure from fetus to adult life. Maternal height is also related to uterine volume and inhibits fetal growth (Svefors et al., 2016). The fetus before birth is protected by the uterus. Normally, the uterus will enlarge following gestational age to allow the growth of a larger fetus. Factors such as height and weight, family history, race or ethnicity can cause the uterus to appear smaller.

A condition of fetal growth that is less than normal, a deviation from or a decrease in the fetal growth pattern which is characterized by the size and weight of the fetus being less than the gestational age (IUGR). The main symptom of IUGR is the size and weight of the fetus that is less than the gestational age. Estimated body length and weight, as well as head circumference measurements, are included in these measurements. The mother's height before pregnancy is one of the reasons for this intrauterine growth restriction.

Mothers who are short in height can experience unhealthy pregnancy outcomes, such as low birth weight. Babies with LBW are at risk of experiencing growth disorders during childhood, adolescence and adulthood, and are at risk of giving birth to the next generation who are

malnourished. Short children will occur between generations if this problem is not corrected (WHO, 2009).

Additionally, shorter mothers are more susceptible to obstructed labor or cesarean delivery. One of the problems associated with obstructed labor is a woman's shorter and narrower pelvis, which causes the baby's head (i.e. cephalopelvic imbalance) or shoulders to be obstructed. Cortical bone deposition is influenced by growth hormone, which can also stimulate growth and increase in height. To support growth and prevent stunting or growth failure in the next generation, this must be balanced with adequate nutritional intake. During the first thousand days of life, from pregnancy to two-year-old toddler, nutrition is important.

To prevent stunting, the government improves maternal health, such as giving pregnant women blood supplement tablets of at least ninety tablets during pregnancy, giving pregnant women additional food, fulfilling nutrition, giving birth with an expert doctor or midwife, IMD (Early Initiation of Breastfeeding), exclusive breastfeeding for babies up to six months of age, complementary breast milk for babies from six months to two years of age, das vaccinations. Young women are expected to give birth to children who are not stunted, so it is very important for them to fulfill their nutritional needs by consuming Blood Supplement Tablets and maintaining a balanced diet. .

According to research conducted by Ozaltin, Emre, et al. (2010), research originating from 109 Demographic and Health Surveys conducted in 54 countries shows that maternal height is the main factor that inhibits intrauterine growth, low birth weight, and the incidence of stunting. Studies in Egypt found that children born to mothers with a height of less than 150 cm were more at risk of experiencing stunting (Zottarelli LK, et al., 2007).

4. CONCLUSION

Based on research in Dolok Tolong Village, Dairi Regency, the majority of stunted children are women whose mothers are aged 20-39 years and work as farmers. There is a significant relationship between exclusive breastfeeding, family income, maternal education, maternal parity, and maternal height and the incidence of stunting, with ρ-values of 0.000 respectively; 0.001; 0.029; 0,000; and 0.000. Of all these factors, maternal height has the strongest correlation with the incidence of stunting, with an Odds Ratio of 5.976, which indicates that mothers with low height have a 5.9 times greater chance of having a stunted child compared to mothers of normal height.

REFERENCES

Adair, L.S, & Guilkey, D.K, 1997, Age Specific determinant of *stunting* in Filipino children, *The Journal Of Nutrition*, 127, 314-320 Diakes dari The Journal Of Nutrition database

Adriani M, Kartika V, 2013, *Pola Asuh Makan pada Balita dengan Status Gizi Kurang di Jawa Timur, Jawa Tengah, dan Kalimantan Tengah Tahun 2011*, Bulletin Penelitian Sistem Kesehatan 16(2): 185-193

Agusto, S,M. 2016, *Stunting* in children under five years old is still a health problem is the western Brazillian Amazon : a population based study in Assis Brazil, Acre Brazil. *Jurnal Ilmiah*

Almatsier, 2009, *Prinsip Dasar Ilmu Gizi*, Jakarta, Gramedia Pustaka Utama

Antisipasi Generasi *Stunting* Guna Mencapai Indonesia Emas 2045 (BKKBN, 2021)

Aprianto, D, 2013, *Perbedaan Pola Asuh Makan pada Berbagai Tingkatan Posyandu terhadap Tingkat Konsumsi Energi dan Protein*, Malang, Universitas Brawijaya Malang

Atikah R, 2018, Buku Ajar Gizi 1000 Hari Pertama Kehidupan, Program Studi Kesehatan Masyarakat Fakultas Kedokteran Universitas Lambung Mangkurat

Aryu Candra, 2020, Epidemiologi *Stunting*, Semarang, Fakultas Kedokteran Universitas Diponegoro

Atikah R, Fahrini Y, 2015, Riwayat Berat Badan Lahir dengan Kejadian *Stunting* pada Anak Usia di Bawah Dua Tahun. *Jurnal Kesehatan Masyarakat Nasional*

Balitbangkes, 2018, *Hasil Riset Kesehatan Dasar* 2017, Jakarta, Kemenkes RI

Bishwakarma, R, 2011, *Spatial Inequality In Children Nutrition In Nepal : Implications Of Regional Context and Individual Household Composition* (Disertasi University Of Maryland, College Park, United Stated) Diakses dari http://hdl.handle.net/1903/11683

Deepak S, Sweta S, Pradeep S, 2016, Pembatasan Pertumbuhan Intrauterin: Aspek Antenatal dan Postnatal,

Engle PL, Menon,P, Haddad, L, 1997 Care and Nutrition: *Concepts and Measurement.* Washington DC: International Food Policy Research Institute

Green, L.W, Lewis, F,M. 1986, Measurement and Evaluation in Health Company Education and Health Promotion, Mayfield Publishing, California

Ikeda, N, Yuki, I & Shibuya, K. 2013 Determinats of reduced child *stunting* in Cambodia: Analisys of pooled data from there demographic and health survey, bulletin of the *WHO*, 91,341-349. Doi http://dx doi .org/ 10.2471/BLT.12. 113381.

Kemenkes RI, 2018, *Buletin Jendela Data dan Informasi Kesehatan*, Jakarta, Pusat Data dan Informasi

Kementerian Keuangan, 2018, *Penurunan Angka Stunting*, Jakarta, Kemenkeu

Khairun, 2020, Pedoman Asupan dan Asuhan 1000 Hari Pertama Kehidupan, Bandar Lampung

Kristianti, D. Suriadi. Parjo 2013, Hubungan antara Karakteristik Pekerjaan Ibu Dengan Status Gizi Anak Usia 4 – 6 Tahun di TK Salomo Pontianak, *Jurnal Publikasi Mahasiswa Keperawatan FK UNTAN*, vol 3, no 1, (http://jurnal. Untan.ac.id/index.php/jmkeperawatanFK/ article/view/3804/3807, diakses 5 April 2023

Meilysari, F, & Isnawati, 2014, Faktor Risiko Kejadian *Stunting* pada Balita Usia 12 bulan di Desa Purwokerto Kecamatan Patebon, Kabupaten Kendal, *Journal Of Nutrition College,*3(2), 16-25, Diakses dari http://www,ejournal S1.undip.ac,id

Mexitalia, 2011, Air Susu Ibu dan Menyusui, Buku Ajar Nutrisi Pediatrik dan Penyakit Metabolik, Edisi 1 hal 77-95, Jakarta, IDAI

Millenium Challenge Account Indonesia (MCA Indonesia), 2015, *Stunting dan Masa Depan Indonesia,* Jakarta

Mitra, Nurlisis, Uci R, 2022, Remaja Sebagai Agen Perubahan dalam Pencegahan *Stunting,* Bandung

Nayu I, 2013, Determinants Ofreduced child *stunting* in Cambodia: analysis of pooled data from three Demographic and health surveys, *Jurnal Ilmiah*

Neufeld LM, Haas JD, Grajeda R, 2004, Changes in maternal weight from the first to second trimester of prednancy are associated with fetal growth and infant length at birth. *Am J Chin Nutr* 79(4) : 646-652

Ni'mah K, & Nadhiroh, R,S, 2015, Faktor yang berhubungan dengan Kejadian *Stunting* Pada Balita, Surabaya, *Media gizi Indonesia* Vol 10.No.1 Januari-Juni 2015, hal 13-19

Notoatmojo, S, 2003, *Prinsip-Ptrinsip Dasar Ilmu Keseahatan Masyarakat*, Jakarta, Rineka Cipta

Palino, L,I, Madjid, R & Ainurafiq, 2017, Determinan Kejadian *Stunting* Pada Balita Usia 12-59 Bulan di Wilayah Kerja Puskesmas Puuwatu Kota Kendari Tahun 2016, *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat* Vol.2/No.6/Mei 2017.

Paudel R, Pradhan B, Wagle, R.R, Pahari, D.P & Otta, S.R, 2012, Risk Factors For *Stunting* Among Children, A Community Based Cased Control Study InNepal, *Kathmandu University Medical Jurnal*, 10(3), 18-24

Peraturan Presiden RI Nomor 72 Tahun 2021 tentang *Percepatan Penurunan Stunting* (Lembaran Negara Republik Indonesia Tahun 2021 Nomor 172)

Pernila, 2016, Stunted at 10 Years Linear Growth Trajectories and *Stunting* From Birth to Pre-Adolelescence in s rural Bangladeshi Cohort; *Jurnal Ilmiah*

Politeknik Kesehatan Kemenkes Semarang Jurusan Gizi, 2019, Buku Saku Gizi 1000 Hari Pertama Kehidupan, Semarang

Pormes, E.W, Rompas, S, Ismanto, Y.A, 2014, *Hubungan Pengetahuan Orang Tua Tentang Gizi dengan Stunting pada Anak Usia 4-5 Tahun di TK Malaekat Pelindung* Manado, PSIK FK Unsrat, email:wellempormes@gmail.com

Rochmah, M.A, 2017, Faktor-Faktor yang berhubungan dengan *Stunting* pada Balita Usia24-59 Bulan

Rocjati, 2003, Skrining Antenatal Pada Ibu Hamil, *Jurnal Ilmiah,* Surabaya, Universitas Airlangga,

Stunting di Sumatra Utara Memprihatinkan, Data Badan Kependudukan dan Keluarga Berencana (BKKBN, 2022)

UNICEF, 2013, *Improving Child Nutrition, the Achievable Imperative For Global Progress*, New York, United Nations Children's Fund

UNICEF, 2012, *Ringkasan Kajian Gizi Oktober 2012*, Jakarta, UNICEF Indonesia

Wahyudi, B.F, Sriyono, Indarwati,R, 2015, *Analisis Faktor yang berkaitan dengan Kasus Gizi Buruk pada Balita,* Surabaya Fakultas Keperawatan Unair, Email: venom. nyasar@gmail.com

WHO, 2022, *Nutrition Landscape Information System (NLIS) Country Profile Indicators: Interprestation Guide*, Geneva, World Health Organization

WHO, 2014, *WHA Global Nutrition Targets 2025: Stunting Policy Brief*, Geneva, World Health Organization

100 Kabupaten/Kota Prioritas untuk intervensi anak kerdil (*Stunting*), Tim Percepatan Penanggulangan Kemiskinan (Sesneg, 2017)