The Influence of Parenting Patterns, Diarrhea Diseases and Infections on the Incidence of Stunting Toddlers in Poor Families in Medan City

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Abstract

Inadequate nutrition, both in terms of quality and quantity, and recurrent childhood illnesses can cause stunting over time, particularly in low-income or impoverished households. In order to determine how parenting styles affect toddler stunting in low-income Medan City families, this study will examine how these behaviors relate to breastfeeding, complementary feeding, food preparation, environmental hygiene and sanitation practices, taking care of sick children, and infectious diseases that include diarrhea and acute respiratory infections. The case-control methodology was employed in this study. The Medan City region served as the study's site from November 2022 to December 2023. There were 364 people in the study sample. By comparing the number of samples in the case group and control group 35 samples in the case group and 70 samples in the control group the study sample consisted of 105 children from low-income families. The cluster sampling approach was used to carry out the sampling procedure. Utilizing an interview-style questionnaire, data were gathered. By measuring children's heights with a toddler height meter, the occurrence of stunting in children was discovered. Primary data were gathered using questionnaires, and secondary data were gathered using information from Child Identity Card books. Data analysis using logistic regression for multivariate analysis, chi-square test for bivariate analysis, and descriptive univariate analysis. use SPSS software version 16.0 for data processing. The study demonstrated a strong relationship between breastfeeding and complementary feeding (p-value 0.006) as well as environmental sanitation hygiene practices (p-value = 0.017) and the occurrence of stunting in toddlers from impoverished households. The dominant factor influencing the incidence of stunting in Medan City is the factor of breastfeeding and complementary feeding that is not good has a risk of 3.473 times experiencing stunting compared to children with good breastfeeding and complementary feeding.

Keywords: Parenting, Poor Family, Stunting, Toddler

INTRODUCTION

One of the Sustainable Development Goals (SDGs) that is part of the second SDG, which is to achieve food security and eradicate hunger and all kinds of malnutrition by 2030, is stunting (Haskas, 2020). The Indonesian Ministry of Health defines stunting as the incapacity of children under five to grow as a result of chronic malnutrition (Kemenkes RI, 2020). For body length or height relative to age, toddlers who are short or stunted have a z-score value of less than -2 standard deviations, and for very short (severely stunted) toddlers, less than -3 standard deviations (Maro et al., 2023).

Stunting is influenced by direct factors such as low birth weight , infectious diseases such as acute respiratory infections, intestinal infections (diarrhea), food consumption. Meanwhile, indirect factors such as poor parenting health services in the form of incomplete

immunization status, as well as family characteristics (Shodikin et al., 2023). Diarrhea is a risk factor for stunting which is caused by the duration of the diarrhea lasting one to two days, thus affecting the child's appetite. Diarrhea is an infectious disease characterized by a change in the shape of the stool which becomes soft, the frequency of defecation increases, and is accompanied by vomiting, resulting in a lack of fluids in the sufferer's body or severe dehydration (Solin et al., 2019; Lusiani et al., 2021).

Acute respiratory tract infection is an infectious disease that causes morbidity and death from infectious diseases in the world. There are actually both manifestations of acute respiratory infections: upper and lower respiratory tract infections. Lower respiratory tract infections such as pneumonia and bronchiolitis are the main contributors to deaths due to acute respiratory infections (Maro et al., 2023). Children who have a history of acute respiratory infections are usually characterized by symptoms of cough, including specifically colds and fever, this situation will disturb the child's appetite (Noorhasanah et al., 2020).

Repeated infections have been shown to cause disruptions in the digestive tract, malnutrition risk, and growth hormone production in children (Alifariki et al., 2020). Several studies have explored the factors that cause stunting in children, with stunting being associated with environmental conditions (Budge et al., 2019). Stunting is linked to demographic factors of parents, especially mothers (Murugan et al., 2018). Poor maternal parenting relationships have a high risk of causing stunting in children (Noorhasanah et al., 2020). In line with Nurmalasari et al., (2020) studies show a connection between the prevalence of stunting and poor household income. When it comes to the amount and quality of food, income is the most important aspect (French et al., 2019).

Data on stunting prevalence in Medan city fell from 25.4% to 21.6% in 2022. The stunting prevalence target in Indonesia in 2024 is 14%. According to data from the Indonesian Nutrition Status Survey in 2022, the percentage of stunted children with acute respiratory infections aged 6 -11 months has increased to 29% from 26.4% in 2021 and diarrhea has decreased to 9% from 11.1% in 2021 (Dinkes Kota Medan, 2021). Poor parenting patterns in the family are one of the causes of nutritional problems. The ability of the family to give time, attention, and support to one another is a component of parenting styles (Noorhasanah et al., 2020).

Data from a parenting pattern survey conducted on 30 poor families in the city of Medan through interviews showed that the proportion of family parenting patterns that were poor in terms of child care was around 20%, exclusive breastfeeding was around 35% and provision of breastfeeding complementary foods, around 22%, was not good. food preparation

around 23%, hygiene and environmental sanitation practices around 31%. This is caused by various factors such as lack of family information about good parenting patterns, caregivers who have low knowledge and low family income.

Based on this description, researchers are interested in conducting further research on "Parenting Patterns, Diarrhea and acute respiratory infection on the incidence of Stunting Toddlers in Poor Families in Medan City". The purpose of this study is to examine the relationship between the incidence of stunting in toddlers from low-income families in the city of Medan and parenting styles, such as providing breast milk and breastfeeding complementary foods, food preparation, environmental hygiene and sanitation practices, caring for children when sick, and acute respiratory infections and diarrheal disease.

METHOD

This study is an analytic study with a case control approach. This study was conducted in the Medan City area from November 2022 to December 2023. The population of this study were all toddlers aged 0 to 59 months of stunting location from poor families in Medan City, totaling 364 people.

The sample was calculated from the Lameshow formula based on the Indonesian Nutritional Status Study p2 = 0.15 with a ratio of 1:2. The minimum sample size can be calculated using the following formula:

$$n = \frac{|z1\text{-}\alpha/2\sqrt{2P(1\text{-}P)} + z1\text{-}\beta\sqrt{P1\,(1\text{-}P1) + P2\,(1\text{-}P2)}|^2}{(P1\text{-}P2)^2}$$

Information:
n = Minimum sample size
α = Level of significance (0.05) with z1-α/2 = 1.96
ß = Research power (80%) with z1-β = 0.84
OR=the magnitude of the odds ratio in previous research or preliminary research=4.67
P2 = proportion of exposed subjects in the non-disease group = 0.15
P1 = proportion of exposed subjects in the group with disease = 0.45

$$n = \frac{|1{,}96\sqrt{2(0{,}3)(1\text{-}0{,}3)} + 0{,}84\sqrt{0{,}45\,(1\text{-}0{,}45) + 0{,}15\,(1\text{-}0{,}15)}|^2}{(0{,}45\text{-}0{,}15)^2}$$

$$n = 34 \approx 35$$

The samples obtained were 35 case groups, namely stunted toddlers in accordance with the Medan City stunting data locus and 70 control groups, namely non-stunted toddlers who lived in areas near where stunted toddlers lived. Thus, the total number of samples used was 105.

The type of data in this data collection used primary data, namely using questionnaires and secondary data through the respondent's Child Identity Card book, from the Medan City Health Office and related Social Services in the study area.

The sampling technique used the cluster sampling method using a gradual cluster, namely determining 30% of the selected sub-districts using a simple random method from 21 sub-districts, namely seven sub-districts.

Univariate, bivariate, and multivariate analysis were employed in data analysis. The odds ratio (OR) test was used in this study to identify the risk factors for stunting. Data analysis needs were fulfilled by employing univariate analysis for description, bivariate analysis using chi-square test, and multivariate analysis utilizing logistic regression test. Data processing analysis was performed using SPSS software application version 16.0. Health ethics approval for this study has been acquired under the number 009/KEPK/UNPRI/I/2024.

RESULTS

Table 1. Characteristics of Toddlers in the Case (Stunting) and Control (Not Stunting) Groups of Toddlers from Poor Families in Medan City in 2023

Toddlers	Case		Control	
	n=35	%	n=70	%
Age				
0-24 months	7	20	9	12,9
>24-36 months	7	20	22	31,4
>36-59 months	21	60	39	55,7
Gender				
Male	14	40	30	42,9
Female	21	60	40	57,1

Table 1. Characteristics of under-fives in this study based on age and gender. Most of the study samples were aged above 36-59 months with a percentage of 60% in the case group and 55.7% in the control group. The proportion was greater in females with a percentage in the case group of 60% and the control group of 57.1%

Table 2. Distribution of Mothers of Toddlers in the Case (Stunting) and Control (Not Stunting) Groups of Toddlers from Poor Families in Medan City in 2023

Toddler Mother	Case		Control	
	n=35	%	n=70	%
Mother's last education				
elementary school	8	22,9	13	18,6
Junior High School	16	45,7	27	38,6
Senior High School	11	31,4	30	42,9
Mother's Job				
Housewife	27	77,1	56	80,0
Working Mother	8	22,9	14	20,0
Family Income				
Less than the city minimum wage	25	71,4	21	30,0
More equal to the city's minimum wage	10	28,6	49	70,0

Table 2. Characteristics of Mothers of Toddlers states that of the 105 respondents from poor families in Medan City in 2023, the percentage of the case group where the majority of the mother's education was junior high school was 45.7%, while in the control group the majority group was senior high school at 42.9%. The majority of mothers in the case group were housewives at 77.1%, while in the control group the majority were also women at 80%. The percentage of monthly family income in the case group is predominantly smaller than the Regency/City minimum wage of 71.4%, while in the control group the majority is smaller than the Regency/City minimum wage of 30%.

Table 3. The Relationship between Parenting Patterns and the Incident of Stunting Toddlers in Poor Families in Medan City

Parenting Dimension	Case		Control		OR	p-value
	n=35	%	n=70	%	(CI 95%)	
Providing breast milk and breastfeeding complementary foods						
Good	13	37.1	50	71.4	4.321	0.001
Not good	22	62.9	20	28.6	(1.791-9.995)	
Food Preparation and storage						
Good	16	45.7	38	54.3	1.410	0.407
Not good	19	54.3	32	45.7	(0.625-3.184)	
Practice Hygiene and sanitation						
Good	13	37.1	48	68.6	3.692	0.002
Not good	22	62.8	22	31.4	(1.576-8.058)	
Care for Toddlers in Health Conditions						
Good	14	40.0	42	60.0	3.750	0.053
Not good	21	60.0	28	40.0	(0.483-5.171)	

According to Table 3. The significance test results (p-value 0.001) suggest a link between nursing, breast milk-complementary diets, and the frequency of stunting in toddlers from low-income households in Medan City. The probability result is smaller than the 5% significance level (0.001 <0.005). Toddlers in low-income households in Medan City are four

times more likely to have stunting in toddlers with a poor history of nursing and supplemental feeding, according to the Odds Ratio (OR) = 4.321 (95% CI = 1.791-9.995).

There is no significant association between food preparation and storage and the frequency of stunting in impoverished families in Medan City, as indicated by the results of the significance test (p-value 0.407).

The significance test results for environmental hygiene and sanitation practices showed a link between these factors and the frequency of stunting in low-income families in Medan City (p=0.02). Then the Odds Ratio (OR) value = 3.692 (95% CI = 1.576-8.058) was obtained, meaning that toddlers with a history of poor environmental hygiene and sanitation practices were at risk of 3 times experiencing stunting in poor families in Medan City.

Sick child care, from the significance test results (p=value 0.053), this means there is no significant relationship between sick child care and the incidence of stunting in poor families in Medan City.

Table 4. Relationship between Diarrhea and the Incidence of Stunting in Toddlers in Poor Families in Medan City

Diarrhea Disease	Case		Control		OR (95% CI)	p-value
	n=35	%	n=70	%		
No Diarrhea	16	45.7	36	51.4	0.305 (0.557-2.837)	0.581
Diarrhea	19	54.3	34	48.6		

Based on Table 4. it can be seen that there is no relationship between the results of the study showed that diarrheal disease, from the results of the significance test (p=value 0.581), the probability result is greater than the 5% significance level (0.001 > 0.005), meaning that there is no significant relationship between diarrheal disease and the incidence of stunting in poor families in Medan City.

Table 5. Chi Square Test Results of the Effect of Acute Respiratory Infection on the Incidence of Stunting Toddlers in Poor Families in Medan City

Acute Respiratory Infection Disease	Case		Control		OR (95% CI)	p-value
	n=35	%	n=70	%		
No Acute Respiratory Infection	15	42.9	37	52.9	1.495 (0.660-3.383)	0.334
Acute Respiratory Infection	20	57.1	33	47.1		

Based on Table 5. Acute respiratory infections, from the significance test results (p=value 0.334), Acute respiratory infections and the prevalence of stunting in low-income households in Medan City do not significantly correlate, according to the probability value, which is higher than the 5% significance level (0.001 > 0.005).

Table 6. Logistic Regression Test Results on the Effect of Parenting Patterns on the Incidence of Stunting Toddlers in Poor Families in Medan City

Parenting Dimension	Coefficient	P-value	OR	95% CI
Step 1 Providing breast milk and complementary foods	1,358	0,004	4,208	1,558-10,306
Food Preparation and storage	-0,115	0,811	0,891	0,346-2,293
Practice Hygiene and sanitation	1,113	0,019	3,045	1,198-3,738
Toddler Care	0,923	0,054	2,517	0,985-6,430
Diarrhea	-0,046	0,922	0,955	0,380-2,403
Acute Respiratory Infections	0,600	0,217	1,649	0,654-4,161
Step 2 Providing breast milk and complementary foods	1,224	0,006	3,473	1,424-8,471
Practice Hygiene and sanitation	7,082	0,017	2,950	1,209-7,197

Based on Table 6, The characteristics that had the most correlation with the incidence of stunting among children under five from low-income households in Medan City were breastfeeding, complementary feeding, and cleanliness behaviors, according to the findings. This indicates that children who receive inadequate nursing and complementary feeding are at 3.473 times higher risk of stunting than children who receive adequate breastfeeding and food.

DISCUSSION

The relationship between breastfeeding and breastfeeding complementary foods on the incidence of stunted toddlers in poor families in Medan City

The study's results show a connection between providing extra food and nursing, and the occurrence of stunted growth in young children from low-income households in Medan. The findings of this study are consistent with studies done on toddlers in the Kedungtuban Community Health Center's service region who were between the ages of 24 and 59 months. According to the study, children who were not breastfed exclusively for the first six months of their lives were 5.54 times more likely to suffer from stunting (Nisa, 2020).

This research, along with other studies, indicates a strong correlation between the prevalence of stunting in toddlers in the Sidomulyo Inpatient Health Center, Pekanbaru, and exclusive breastfeeding. They say that children are fussy, with early breastfeeding complementary foods given, parents think the child will be calm and can sleep soundly (Fitri & Ernita, 2019). Other research findings indicate that feeding practices have an impact on the nutritional status of children between 6 and 24 months old. The variety and sufficiency of food ingredients available for family use are severely restricted (Wantina et al., 2017). Another study concluded that nutritional parenting patterns influence the incidence of stunting (Shodikin et

al., 2023). Additional studies indicate a connection between the prevalence of stunting in children between the ages of 24 and 59 months in the Mangasa Health Center Working Area, Makassar City in 2020, and exclusive breastfeeding (Saadong et al., 2021).

The parenting style of providing breast milk and complementary foods in this study is related to the incidence of stunting because breast milk is not flowing smoothly. Apart from that, some mothers work so they don't give breast milk to the baby but instead give the baby formula milk, the mother gives birth in the hospital, the mother has not had time to breastfeed her baby and has been given formula milk from the hospital on the grounds that the baby's mother cannot breastfeed because she is still sick after the caesarean section. So that the nutritional needs of breast milk that babies really need are not met, which has a big impact on the baby's growth and development.

The Relationship between Food Preparation and Storage and the Incident of Stunting Toddlers in Poor Families in Medan City

The study's results suggest that there is no correlation between the prevalence of stunting in low-income households in Medan City and the handling and storage of food. The study findings align with previous research, showing that the intervention group had a higher proportion of women with strong knowledge and positive parenting practices compared to the control group (Naulia et al., 2021). Several studies have stated that most of the parenting patterns used by mothers for stunting toddlers are inappropriate, with mothers not paying attention to the nutritional needs of toddlers (Bella et al., 2020; Wibowo et al., 2023).

Stunted toddlers in the Sumbang II Community Health Center Work Area in this study displayed inadequate parenting habits related to food distribution, preparation, and storage, despite their low nutritional requirements (Widianti et al., 2023). Lack of family education regarding stunting and balanced nutrition in children is the root cause of stunting (Rahmadiyah et al., 2023). Based on research Laili et al., (2021), the parents' food is the primary factor determining the incidence of stunting in this study.

The Relationship between Environmental Hygiene and Sanitation Practices and the Incident of Stunting Toddlers in Poor Families in Medan City

The study shows a significant between the occurrence of stunting in young children from low-income households in Medan City and the level of environmental cleanliness and sanitation practices. The findings of this investigation are consistent with those by Melani et al., (2023), Research demonstrates a clear connection between sanitary standards and the occurrence of stunting in children aged 24 to 59 months. In the Sokka posyandu in the coastal region of Bumi Anyar Village, Bangkalan Regency, mothers who keep an eye on their kids'

hygiene or cleanliness would have a good impact on their kids' nutritional status (Aisah et al., 2019).

This research is also strengthened by research conducted by Khairiyah et al., (2020), which concluded that hand hygiene and the incidence of stunting have a significant relationship, which is one of the major risk factors in toddlers. become obstructed. Respondents who have poor clean water supply sanitation have a 2.705 times greater chance of experiencing stunting compared to respondents who have good clean water supply sanitation (Nisa et al., 2021). The research results show that respondents who practice poor personal hygiene have babies with more or less nutritional status in poor families (Sartika et al., 2021).

Most mothers wash their hands with water but do not use soap due to economic factors and the availability of good soap, specifically cleaning their hands with soap and running water prior to and following meals. The behavior of mothers who always cut the nails of toddlers who answered correctly was 71.4% in the case group and 84.3% in the control group. Based on the results of interviews with mothers who do not cut their children's nails regularly, they explained that mothers often forget to cut their children's nails so that their children's nails are long and dirty.

The Relationship between Child Care in Seeking Treatment and the Incidence of Stunting Toddlers in Poor Families in Medan City

The incidence of stunting in toddlers from low-income households in Medan City is unrelated to the availability of child care when seeking treatment, according to the analysis of research findings. The likelihood of stunting is unrelated to child care because, in the event that a child becomes ill, the mother takes them to the closest health facility right away. If the child does not get better after two to three days, they are then taken to the closest health facility; the health facility and the home are relatively close to one another, and there are reasonably priced transportation options available to take sick children to appointments so they can receive the best care possible.

The study's results align with earlier research suggesting there is no correlation between The study's results align with previous research on parenting styles, indicating no correlation between parental upbringing approaches and the occurrence of stunting at SDI Taqwiyatul Wathon (Aisyah et al., 2019). The nutritional status of children aged 6-24 months is significantly impacted by health service practices, according to recently published research, with a p-value of 0.008 and an odds ratio (OR) of 7.408 (Sartika et al., 2021).

Hayyudini (2017), Stunting incidence is not significantly correlated with health service practices, according to research conducted in Semarang City. The Social Security

Administration Program's existence can enhance healthcare in rural areas (Fadyllah et al., 2021).

The Relationship between Diarrhea and Stunting in Toddlers in Poor Families in Medan City

The study analysis's findings indicate that there is no correlation between the prevalence of stunting in toddlers from low-income families in Medan City and diarrhea (p value=0.922). This study found no significant correlation between the incidence of stunting and a history of diarrhea, because diarrhea in children tends to be treated quickly and the duration of diarrhea is not too long, two to three days before the child recovers from diarrhea, but there could be a risk in the stunting group if children suffer from diarrhea for a long period of time and repeatedly than those who are not stunted.

This is not in line with research by Ihsan et al., (2020), which shows that the duration of diarrhea in days has a direct effect on stunting in toddlers. As well as the levels of E.coli in clean water sources and the quality of unsanitary latrines have an indirect effect through the duration of diarrhea on stunting (Budge et al., 2019).

Based on additional research showing a statistically significant relationship between the frequency of acute respiratory infections and stunting. Toddlers who have had diarrhea in the past are 2.2 times more likely to experience growth retardation than children who have never experienced it (Himawati et al., 2020). This study is consistent with other studies Nasrin et al., (2023), that a relationship exists regarding diarrhea and stunting. Toddlers who have diarrhea are more likely to stunt than those who have not experienced diarrhea in the previous two weeks (Lusiani et al., 2021).

The Relationship between Acute Respiratory Infection and the Incident of Stunting Toddlers in Poor Families in Medan City

Research investigation indicates that there is no correlation between the occurrence of stunting in toddlers from low-income families and Acute Respiratory Infection. Because pediatric acute respiratory infection disease is usually easily treated and does not result in a decline in nutritional status because the illness can heal itself rather quickly, the association between a history of acute respiratory infection and the incidence of stunting was deemed insignificant in this study.

The study's findings are consistent with research demonstrating that the incidence of stunting at the Rumbia Community Health Center and Acute Respiratory Infection do not

significantly correlate (OR=0.4). This is possible because upper respiratory infections are common infections and are easily transmitted to children (Usman et al., 2021). Acute respiratory infection significantly affects the occurrence of stunting, as indicated by earlier investigations. Inflammation from infections throws off the body's immune system and metabolism. In addition to consuming too little food because of a decreased appetite (Himawati et al., 2020).

The Acute Respiratory Infection duration variable shows that children who experience stunting often contract infectious diseases in the last 6 months (Lusiani et al., 2021). This research is in line with Arini et al., (2020), stating that the findings indicate a connection between stunting and infectious disorders, specifically acute respiratory infections. Based on previous research conducted by Maro et al., (2023), stated that one of the factors causing stunting in children is Acute Respiratory Infection infections which have a significant impact on reducing nutritional status in children both from body weight and height for age.

CONCLUSION

Supplying breast milk, introducing supplemental foods, and maintaining environmental cleanliness and sanitation practices are closely linked to the occurrence of stunting in young children from impoverished households in Medan City. Parenting practices that include both breast milk and complementary foods reduce the incidence of stunting by 3.473 times compared to parenting practices that only give breast milk and complementary foods.

In Medan City, where parenting styles are strongly correlated with the incidence of stunting, it is hoped that parents, particularly mothers or caregivers, will be more intensive in their child-rearing to prevent an increase in the prevalence of stunting, particularly in low-income families. stunting in young children from low-income Medan City homes. Children's height development is greatly influenced by parental efforts to provide breast milk and supplemental nutrients, prepare and store food, maintain good hygiene, and get health care.

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