

Influence of Nutritional Intake and Exclusive Breastfeeding History on the Incidence of Stunting in Children Aged 12-24 Months in Deli Serdang Regency

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ABSTRACT

This research chose children aged 12-24 months as the sample because they are in a critical period of physical and cognitive growth, vulnerable to stunting due to inadequate nutritional intake. Other research shows that inadequate nutritional intake at 6-24 months of age can affect brain development and a child's future intelligence. It is important to monitor the nutritional intake and nutritional status of children aged 12-24 months to reduce the risk of stunting and its negative impact on cognitive development. Additionally, at this age, exclusive breastfeeding plays a crucial role in child growth, and this research can help understand the relationship between exclusive breastfeeding, nutritional intake, and stunting in children aged 12-24 months.

INTRODUCTION

Stunting is a chronic nutritional deficiency in children, characterized by shorter height compared to age and gender standards. It occurs due to insufficient nutritional intake, affecting physical and brain development and potentially harming future education and economy. Stunting is often unnoticed by the community. (Hasbullah et al., 2021). In 2020, around 149.2 million children under the age of five experienced stunting, with a global prevalence of approximately 22 percent. In Indonesia, Cambodia, and Myanmar, stunting prevalence is high, exceeding the WHO standard of 20 percent. In Indonesia alone, approximately 32 percent of 556 million children suffer from stunting. (Hasbullah et al., 2021; Mutiarasari et al., 2021; World Health Organization, 2021). The prevalence of stunting in North Sumatra Province in 2018 was 32.39 percent, then decreased to 30.11 percent in 2019. In 2022, the prevalence of stunting in this province decreased to 21.1 percent. Stunting prevention is focused on 15 regencies/cities, including South Nias, Nias, Mandailing Natal, North Padang Lawas, and others (SSGI, 2018).

Research in Deli Serdang Regency is important because, despite the decline in stunting prevalence from 2019 to 2021, the figures increased again in 2022. This location has lowland district distribution with high stunting rates, which needs to be the focus of stunting reduction efforts. This study will help understand the factors affecting the high rate of stunting in Deli Serdang Regency and provide input for more effective stunting prevention policies and programs, with the hope of reducing stunting rates in the region and nationwide (e-ppgbm, 2023). Based on e-ppgbm data as of May 30, 2023, there were 424 children experiencing stunting aged 12-24 months. It was also found that Pantai Labu District, Pagar Merbau District, Beringin District, and Galang District had the most children suffering from stunting, totaling 195 in these four districts. The data indicates a stunting problem in these areas, especially in the 12-24 months age group.

This research chose children aged 12-24 months as the sample because they are in a critical period of physical and cognitive growth, vulnerable to stunting due to inadequate nutritional intake. Other research shows that inadequate nutritional intake at 6-24 months of age can affect brain development and a child's future intelligence. It is important to monitor the nutritional intake and nutritional status of children aged 12-24 months to reduce the risk of stunting and its negative impact on cognitive development. Additionally, at this age, exclusive breastfeeding plays a crucial role in child growth, and this research can help understand the relationship between exclusive breastfeeding, nutritional intake, and stunting in children aged 12-24 months. Exclusive breastfeeding offers many benefits to infants, such as complete nutrition, improved immunity, stable mental and emotional intelligence, protection against infectious diseases, and protection against allergies due to its antibody content. Research in Nepal shows that exclusive breastfeeding for six months can reduce the risk of stunting in children aged 0-23 months. Increasing the practice of exclusive breastfeeding for six months is crucial in preventing stunting, especially from gastrointestinal infections.

However, in Indonesia, exclusive breastfeeding coverage is still low due to a lack of public awareness of its importance, the practice of introducing supplementary foods before six months of age, and inadequate nutrition in breastfeeding mothers. (Mufdillah, 2017; Tiwari, 2014; WHO, 2013; Riskesdas, 2018). Micronutrient intake, such as vitamins and minerals, is crucial for child growth and development. Deficiencies in substances like calcium can lead to stunting because they play a role in the immune system, protein synthesis, nerve function, and nutrient absorption. Studies show that a lack of calcium is associated with stunting in children. Research in Glagahombo Village shows that children with low calcium intake have a 5,400 times higher risk of experiencing stunting. These findings align with other research showing a significant relationship between insufficient calcium intake and the risk of stunting. (Wati, 2021; Ferani, 2019).

Data from a preliminary survey in Deli Serdang Regency, specifically in Percut Sei Tuan District in 2022, with 70 toddler samples, showed that 47.1 percent of toddlers experienced stunting. The average daily micronutrient intake was less than recommended, with no children meeting their daily calcium requirements. Toddlers in Deli Serdang Regency tend to have a habit of consuming snacks and fast food, such as instant noodles, snacks, pastries, and sugary drinks, as a substitute for healthy meals. The relationship between stunting and nutritional intake deficiencies such as calcium and exclusive breastfeeding is highly relevant in the case of toddlers in Deli Serdang Regency. Further research is needed to analyze the impact of these factors on the incidence of stunting in the region. Therefore, the research problem statement is: "How do nutritional intake and exclusive breastfeeding affect the incidence of stunting in children aged 12-24 months in Deli Serdang Regency?"

LITERATURE REVIEW

Stunting is a chronic nutritional deficiency in children, characterized by shorter height compared to age and gender standards. It occurs due to insufficient nutritional intake, affecting physical and brain development and potentially harming future education and economy. Stunting is often unnoticed by the community. (Hasbullah et al., 2021). In 2020, around 149.2 million children under the age of five experienced stunting, with a global prevalence of approximately 22 percent.

METHODOLOGY

The study employs a quantitative method with a case-control design in Deli Serdang Regency. Seven districts were selected based on the level of stunting: four with the highest levels and three with the lowest levels. The population consists of children aged 12-24 months in Deli Serdang Regency (62,966 children). The case population includes stunted children in the four highest districts (195 children), while the control population consists of non-stunted children in the three lowest districts (2,371 children). There are 90 case and 90 control samples, totaling 180 children with a 1:1 ratio. Primary data were collected through interviews and height measurements. Secondary data were obtained from the Deli Serdang Regency Health Office. Data collection

instruments include interview guidelines and an infantometer with a precision of 0.1 cm. The data cover child characteristics, exclusive breastfeeding history, and calcium intake.

RESEARCH RESULT AND DISCUSSION

The incidence of stunting. There are two observed categories: first, the Stunting category, which includes 90 children (50 percent) experiencing stunting. Stunting is a condition in which a child's physical growth is hindered, and they do not reach the expected height for their age. Second, there is the Not Stunting category, which also includes 90 children (50 percent) who are not experiencing stunting. Children in this group have physical growth that is appropriate for their age. It can be seen that the percentage of children experiencing stunting is the same as the percentage not experiencing stunting, with each being 50 percent.

Table.1 Distribution of stunting incidence in children aged 12-24 months in Deli Serdang Regency

Stunting Incidence	N	Percentage
Not Stunted	90	50
Stunted	90	50

Gender. Table two lists 93 male children and 87 female children. The percentages presented in the table depict the proportion of each gender in the sample. Specifically, 51.7 percent of the total population in the sample are males, while the remaining 48.3 percent are females. As a result, this table provides an overview of the gender distribution in the sample based on the number of children, with the majority being males (51.7 percent) and the rest being females (48.3 percent).

Table.2 Distribution of Child Gender in Deli Serdang Regency

Gender	N	Percentage
Male	93	51,7
Female	87	48,3

Child Age. There are two age groups of children in this sample. The first group consists of children under 18 months old, totaling 67 children (37.2 percent). Meanwhile, the second group includes children over 18 months old, comprising 113 children (62.8 percent). The majority of children in the sample are over 18 months old (62.8 percent), while a small portion is under 18 months old (37.2 percent).

Table.3 Distribution of Child Ages in Deli Serdang Regency

Ages	N	Percentage
Less than 18 Months	67	37,2
More than 18 Months	113	62,8

In the calcium category, there are two intake categories, namely "sufficient" and "insufficient." From the data, approximately 50.6 percent of children have sufficient calcium intake, while 49.4 percent have insufficient calcium intake.

Table.4 Categories of micronutrient intake for children aged 12-24 months in Deli Serdang Regency

Adequacy Level of Nutrient Intake	N	Percentage
Calcium		
Insufficient	89	49,4
Sufficient	91	50,6

From the data presented, we can see that in the group with sufficient calcium intake, approximately 68.8 percent experienced stunting, while 31.2 percent did not experience stunting. On the other hand, in the group with insufficient calcium intake, about 32.2 percent experienced stunting, while 67.8 percent did not experience stunting.

Table.5 Distribution of stunting incidences based on calcium nutritional intake level

Variabel	Stunting Incidences			
	Stunted		Not Stunted	
	n	%	n	%
Calcium				
Insufficient	28	31,2	61	67,8
Sufficient	62	68,8	29	32,2

The information regarding the relationship between the adequacy of calcium and the incidence of stunting in children aged 12-24 months in Deli Serdang Regency. The data in this table can be used to examine the correlation between calcium adequacy and the incidence of stunting in children aged 12-24 months in Deli Serdang Regency.

Table.6 Contingency of calcium adequacy levels and the incidence of stunting in children aged 12-24 months in Deli Serdang Regency

Calcium Adequacy Level	Stunting Incidences			<i>p</i>
	Stunted	Not Stunted		
Insufficient	28	61	89	0.001
Sufficient	62	29	91	

This study reveals the relationship between calcium adequacy and stunting in children aged 12-24 months in Deli Serdang Regency. There is a significant difference in the incidence of stunting between the group with sufficient calcium intake and those with insufficient intake. The group with sufficient calcium intake has more children experiencing stunting (62 children) than those who are not stunted (29 children). In the group with insufficient calcium intake, only 28 children are stunted, while 61 children are not stunted. The results show strong statistical significance (p -value = 0.001) in the relationship between calcium adequacy and the incidence of stunting in this region.

Factors influencing calcium adequacy in children in Deli Serdang Regency involve the community's understanding and knowledge of the importance of calcium, the availability of calcium-rich foods, and family eating habits. Other studies, such as those conducted by Andriansyah (2022) and Sari et al. (2016), also support the relationship between calcium intake and the incidence of stunting. Dairy products, fish, and seafood play a significant role in children's calcium intake. However, stunted children tend to have lower calcium intake from milk. These findings emphasize the importance of adequate calcium intake in children's diets for optimal growth and development. It is essential to ensure that daily meals provide all the necessary nutrients for normal bodily functions and have an energy balance suitable for children's needs.

Exclusive breastfeeding. Two categories were observed regarding the practice of exclusive breastfeeding. First, there is the "Yes" category, which includes 90 children (50 percent) who received exclusive breastfeeding. This means that each child in this group only received breast milk as their primary source of nutrition, without receiving any additional food or drinks. Second, there is the "No" category, which also includes 90 children (50 percent) who did not receive exclusive breastfeeding. In this group, children received additional food or drinks besides breast milk. This table illustrates the practice of exclusive breastfeeding in this research sample, where the percentage of children receiving exclusive breastfeeding is equal to the percentage of those not receiving it, with each accounting for 50 percent.

Table.7 Distribution of Exclusive Breastfeeding Practices in Deli Serdang Regency

Exclusive Breastfeeding	N	Percentage
No	90	50
Yes	90	50

History of Exclusive Breastfeeding on the Incidence of Stunting. The table presenting the distribution of stunting based on exclusive breastfeeding practices includes the number of children experiencing stunting and those who do not, related to whether they received exclusive breastfeeding or not. In the "Yes" category for exclusive breastfeeding, there are 48 children (26.7 percent) who experienced stunting and 42 children (23.3 percent) who did not experience stunting. Meanwhile, in the "No" category for exclusive breastfeeding, there are

42 children (23.3 percent) who experienced stunting and 48 children (26.7 percent) who did not experience stunting. Overall, there are 90 children (50 percent) who received exclusive breastfeeding, and another 90 children (50 percent) who did not receive exclusive breastfeeding.

Table.8 Distribution of Stunting Incidence Based on Exclusive Breastfeeding

Variabel	Stunting Incidences			
	Stunted		Not Stunted	
	n	%	n	%
Exclusive Breastfeeding				
No	42		48	
Yes	48		42	

The results of the chi-square test were used as an evaluation tool to identify the influence of nutritional intake and exclusive breastfeeding history on the incidence of stunting in the population of children aged 12 to 24 months in Deli Serdang Regency. In this framework, there are several variables that can be tested to assess their correlation with stunting incidence. These variables include carbohydrate, protein, fat, calcium, zinc, vitamin A, and vitamin D intake, as well as the practice of exclusive breastfeeding for the children in the research sample. Information about the relationship between exclusive breastfeeding and the incidence of stunting in children aged 12-24 months in Deli Serdang Regency. The data in this table can be used to examine the correlation between exclusive breastfeeding and stunting incidence in children aged 12-24 months in Deli Serdang Regency.

Table.9 Contingency of Exclusive Breastfeeding and the Incidence of Stunting in Children Aged 12-24 Months in Deli Serdang Regency

Exclusive Breastfeeding	Stunting Incidences		Total	<i>p-value</i>
	Stunted	Not Stunted		
Tidak	42	48	90	0.228
Ya	48	42	90	

This table includes the number of children who experienced stunting and those who did not, based on exclusive breastfeeding, along with the p-value measuring the statistical significance of the relationship. In the group of children receiving exclusive breastfeeding, there were 48 stunted children and 42 non-stunted children. In the group that did not receive exclusive breastfeeding, there were 42 stunted children and 48 non-stunted children.

This study concludes that there is no significant relationship between the practice of exclusive breastfeeding and the incidence of stunting in children. This result is consistent with several other studies that also did not find a significant relationship, such as the research conducted by Husna (2023) in Sabang, Luh Hery (2021) in Banjarmasin, and Hadi (2022) in Banjarmasin. However, there are studies like Azriful et al. (2018) in Majene and Husna (2022) in Nagan Raya that show a significant relationship between exclusive breastfeeding and stunting in toddlers. Research by Pengan et al. (2016) in Central Sulawesi and Indrawati (2016) in Gunungkidul also support this relationship. Overall, the results of this study align with some other research that yields similar outcomes, but there are also studies that produce different results.

CONCLUSIONS AND RECOMMENDATIONS

This study reveals that there is a significant relationship between calcium nutrient intake and the incidence of stunting in children aged 12-24 months in Deli Serdang District, with a very strong level of statistical significance, i.e., $p=0.001$. On the other hand, this study did not find a significant influence between the history of exclusive breastfeeding and the incidence of stunting in children aged 12-24 months in Deli Serdang District, with a statistical significance level of $p=0.228$. Despite the many health benefits of exclusive breastfeeding, in the context of this research, this practice does not have a significant impact on the incidence of stunting in the studied child population. Thus, the research findings emphasize the importance of adequate calcium intake as a more relevant factor in preventing stunting in children aged 12-24 months in this region.

ADVANCED RESEARCH

Still doing further research to find out more about Influence of Nutritional Intake and Exclusive Breastfeeding History on the Incidence of Stunting in Children Aged 12-24 Months in Deli Serdang Regency

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