

The Relationship between exclusive breastfeeding history and nutritional status of toddlers on the incidence of stunting in toddlers

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ABSTRACT

Background: Stunting is a chronic nutritional problem that impacts the physical growth, cognitive development, and health of children in the future. In 2023, Indonesia still had a high rate of stunting at 21.5%, which is higher than the national goal of 14%. In Bengkulu Province, the prevalence of stunting reached 20.2%, while in North Bengkulu Regency it was 8.7%. One of the areas with a high stunting rate is the Kemumu Health Center, where stunting cases were recorded in 120 toddlers (10.56%) in 2024. Factors that affect the incidence of stunting include the history of exclusive breastfeeding and the nutritional status of toddlers.

Objectives: To determine the relationship between exclusive breastfeeding history and nutritional status of toddlers with stunting incidence.

Methods: This type of study is a retrospective case-control design. This research was conducted in July 2025. The population of this study is all toddlers whose data were recorded in the register of the Kemu Health Center's integrated health post (Posyandu). The sample used was 238 toddlers (119 stunted, 119 not stunted) with a simple random sampling technique. The data were analyzed using chi-square.

Results: There was a correlation between exclusive breastfeeding history ($p=0,000$; $OR=8,066$) and Nutritional Status of Toddlers ($p=0,008$) with the incidence of stunting. Toddlers who do not get exclusive breastfeeding are eight times more likely to experience stunting.

Conclusions: There is a relationship between the history of exclusive breastfeeding and the nutritional status of toddlers with the incidence of stunting in toddlers aged 6-59 months at the Kemu Health Center. It is recommended that to solve the stunting problem, it is essential to provide nutritional information corresponding to the specific needs of toddlers.

KEYWORDS: exclusive breastfeeding; nutritional status; stunting

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INTRODUCTION

Stunting is a persistent issue of chronic malnutrition that arises from prolonged inadequate nutritional intake, often resulting from feeding practices that do not align with the necessary nutritional requirements. Stunting can originate in the womb and may only become evident when the child reaches the age of two. The incidence of stunting and other forms of malnutrition in 1,000 HPK not only inhibits physical growth and increases vulnerability to disease but also poses a significant threat to cognitive development. This, in turn, can adversely impact the intelligence and productivity of children as they grow into adulthood (1). In 2022, it was estimated that approximately 148.1 million children worldwide, all under the age of five, experienced stunting. The data indicates that nutritional problems remain prevalent and significantly affect the growth and development of children. Furthermore, over 21.3% of stunted children live in Asia, whereas approximately 30% are found in Africa (2).

Indonesia holds the status of having the highest prevalence of stunting in Southeast Asia, with a rate of 31%. The Philippines follows in the second place, while Myanmar ranks third. At present, approximately 26.4% of children under the age of five in the Southeast Asian region are affected by stunting. According to data derived from the Indonesian Nutrition Status Survey (SSGI) and the Indonesian Health

Survey (SKI), the prevalence of stunting in Indonesia has shown a notable decline over the past five years. It decreased from 30.8% in 2018 to 27.7% in 2019, further dropping to 26.9% in 2020. In 2021, the prevalence was recorded at 24.4%, followed by a reduction to 21.6% in 2022. By 2023, the prevalence of stunting reached 21.5% (2,3).

In Bengkulu Province, the prevalence of stunting exhibited an irregular trend over the years: it was recorded at 22.1% in 2021, decreased to 19.8% in 2022, and then rose again to 20.2% in 2023. The prevalence of stunting in Bengkulu Province has risen compared to the previous year and continues to fall short of the target determined by the National Team for the Acceleration of Stunting Reduction, which aims for a rate of 14% during the period of 2020-2024 (3). According to the data collected through the Community-Based Nutrition Recording and Reporting Electronic Application (EPPGBM), North Bengkulu province recorded the highest prevalence of stunting in 2022 at 9.0%. In 2023, North Bengkulu fell to the second place, with a prevalence rising to 12.3%. However, in the second quarter of 2024, North Bengkulu is projected to regain the top position, showing a decrease in prevalence to 8.7%. The most significant rise in stunting cases was observed in various health center areas, with the D6 Ketahun Health Center reporting the highest rate at 16.29%. This was followed by the Kemumu Health Center at 10.56% and the

Sebelat Health Center at 6.62% (4). The phenomenon of stunting in toddlers significantly affects children's growth and development, influencing both their physical and cognitive abilities. The stunting experienced by school-age children can seriously hinder their capacity to understand lessons at school, ultimately influencing their academic performance. In addition, it poses potential repercussions for their immune system development. Chronic malnutrition in stunted children can weaken their immune systems, which makes them less capable of combating infections and, as a result, more vulnerable to recurring illnesses. One of the symptoms of stunting is a shorter height compared to the average height for the same age group. Furthermore, the weight of toddlers can not only fail to increase but also show a tendency to decrease (5,1).

Stunting arises from a multitude of factors, with one of the primary causes being exclusive breastfeeding. Exclusive breastfeeding fulfills the nutritional requirements of infants while lowering the likelihood of infectious diseases and mortality among them. Infants who are not exclusively breastfed face a greater danger of experiencing diarrhea and various infectious diseases. These health problems can negatively affect the child's growth and development, including a heightened likelihood of stunting (6).

Research conducted at the Surian Health Center indicated a correlation

between exclusive breastfeeding and the incidence of stunting. This factor contributes to stunting in toddlers within the Surian Health Center's work area, primarily due to insufficient exclusive breastfeeding. Such inadequacy leads to weakened immunity in children, making them more vulnerable to diseases. When a toddler suffers from an illness, the body's energy is redirected to combat the infection rather than support growth, which can result in stunted development for the child (7).

The research conducted at the Selopampang Health Center in Temanggung Regency revealed a correlation between exclusive breastfeeding and the incidence of stunting. The findings from a questionnaire completed by mothers of children under five indicate that one contributing factor to stunting in many of the toddlers involved in this study is the practice of breastfeeding in addition to their first intake of formula milk, water, and tea water before the age of six months (8).

Nutritional status refers to the condition of the body as influenced by food intake and the utilization of nutrients within the body. The nutritional status serves as an important indicator of the overall health of individuals across all age groups, including children, adolescents, adults, and the elderly, reflecting the impact of nutritional intake on bodily functions. The classification of nutritional status encompasses three distinct conditions, such as undernourished status, normal nutrition, and overnutrition

(9). The research conducted at the Kaliwates Jember Health Center showed a significant relationship between nutritional status and the incidence of stunting in toddlers, with a p-value of 0.04, indicating statistical significance ($p < 0.05$). The quality of nutritional status profoundly impacts the growth and development of children. Children under the age of five who have poor nutritional status are more likely to experience stunting compared to their peers with normal nutritional status(10). Research conducted at the Jantiasih Health Center demonstrated a correlation between nutritional status and the incidence of stunting. Researchers at the Jantiasih Health Center have found that the family's role in the lives of toddlers involves a dynamic process of interaction between parents and their children. The interactions encompass the involvement of parents in establishing daily practices, including parenting behaviors, hygiene routines, and the utilization of health services (11).

MATERIALS AND METHODS

This research used a retrospective case-control design, conducted out in April 2024. The study population included all children listed in the integrated health posts (*Posyandu*) register at the Kemumu Public Health Center. The study involved a total of 238 respondents, comprising 119 individuals in the case group and 119 in the control group. These participants were selected through a simple random sampling

method. The analysis of the data was conducted utilizing the Chi-Square test. This study applies a technique known as probability sampling, with a focus on simple random sampling. Researchers use random sampling when they consider the population to be homogeneous based on a specific characteristic, allowing for the sample to be selected randomly. In random sampling, every individual has an equal opportunity to be selected for inclusion in the research sample. The author used simple random sampling due to the homogeneity of the population in this study.

RESULTS AND DISCUSSION

RESULTS

Univariate Analysis

A univariate analysis was applied to examine the relationship between the independent variables, which include Exclusive Breastfeeding History and Nutritional Status of Toddlers, and the dependent variable (stunting) as shown in the following **Table 1**.

Table 1 shows that among the 238 respondents, a majority, accounting for 50.8%, have a history of not practicing Exclusive Breastfeeding, with 121 respondents falling into this category. In the assessment of the Nutritional Status of Toddlers, data from 238 respondents indicate that a significant majority, specifically 79%, or 188 respondents, exhibit Good Nutritional Status. The study sample comprises 238 toddlers, with an

Table 1. Exclusive breastfeeding history, nutritional status of toddlers and stunting incidence at UPTD Kemumu Health Center North Bengkulu

Variable	Frequency (F)	Percentage (%)
Exclusive Breastfeeding History		
Not Exclusive Breast Milk	121	50.8
Exclusive Breast Milk	117	49.2
Status of Nutrition News		
Malnutrition	30	12.6
Good Nutrition	188	79
Over Nutrition	20	8.4
Stunting Incidence		
Stunting	119	50
Not Stunting	119	50

Table 2. The Relationship between exclusive breast milk history and the incidence of stunting in toddlers at the UPTD Kemumu Health Center, North Bengkulu

Exclusive Breast Milk	Stunting				Total		p value	OR
	Stunting		No Stunting					
	F	%	F	%	F	%		
Exclusive Breast Milk	89	74.8	32	26.9	121	50.8	0	8.066
Exclusive Breast Milk	30	25.2	87	73.1	117	49.2		
Total	119	100	119	100	238	100		

equal distribution of 119 toddlers experiencing stunting (50%) and 119 toddlers who are not stunted (50%).

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toddlers who are not stunted (50%).

Bivariate Analysis

The analysis of bivariate relationships was conducted to explore the relationships between the independent variables namely, the history of exclusive breastfeeding and the nutritional status of toddlers and the dependent variable, which is stunting. The findings are presented in the **Table 2**.

Table 2 indicates the relationship between the incidence of stunting at the North Bengkulu Kemumu Health Center and the history of exclusive breastfeeding. Among the 119 respondents identified as stunted, a significant majority, specifically

Table 3. The relationship between nutritional status of toddlers and the incidence of stunting in toddlers at the UPTD of the Kemu Health Center, North Bengkulu

Nutritional Status	Stunting				Total		<i>p value</i>
	Stunting		No Stunting				
	F	%	F	%	F	%	
Malnutrition	23	19.3	7	5.9	30	12.6	0.008
Good Nutrition	87	73.1	101	84.9	188	79	
Over Nutrition	9	7.6	11	9.2	20	8.4	
Total	119	100	119	100	238	100	

74.8%, did not engage in exclusive breastfeeding. Ho was rejected while Ha was accepted based on the results of the Chi-square statistical test (with continuity correction), which indicated a p-value of 0.000, or a p-value less than 0.05, demonstrating statistical significance. The findings indicate that, at the UPTD of the North Kemumu Bengkulu Health Center in 2024, there exists a correlation between exclusive breastfeeding and the incidence of stunting. Furthermore, an odds ratio of 8.066 was determined, indicating that toddlers who do not receive exclusive breastfeeding are at an increased risk of experiencing stunting, 8,066 times more so than those who are exclusively breastfed.

Table 3 illustrates the incidence of stunting at the North Bengkulu Kemumu Health Center, organized according to the nutritional status of toddlers. Among the 119 respondents identified as stunted, a modest proportion (19.3%) exhibited Undernourished Status, with a p-value of 0.008, indicating statistical significance ($p < 0.05$). This indicates that there is a relationship between the nutritional status of

toddlers and the incidence of stunting at the UPTD Kemumu Bengkulu Utara Health Center.

DISCUSSION

The Relationship between Exclusive Breast Milk History and the Incidence of Stunting in Toddlers at the UPTD Kemu Health Center, North Bengkulu

Exclusive breastfeeding is one of the main factors in stunting prevention. This is in line with the theory of the direct cause of stunting, namely maternal factors. Mothers who are knowledgeable and apply exclusive breastfeeding from the baby birth to the age of 6 months will be better able to meet the optimal nutritional needs of toddlers. Conversely, low maternal education and knowledge of nutrition can lead to incorrect feeding practices, such as giving formula milk, tea water, or supplements before the baby is 6 months old (12). Supported by research conducted at the Selopampang Health Center, Temanggung Regency, shows a relationship between exclusive breastfeeding and stunting, where children who do not receive exclusive breastfeeding

are more likely to experience stunting(8).

Stunting prevention that can be done in toddlers is by providing adequate nutrition so that toddlers can grow and develop optimally. One factor that can influence nutritional needs in toddlers is exclusive breastfeeding during the first 6 months of life (13). Exclusive breastfeeding plays a crucial role in preventing stunting. This aligns with the theory that identifies maternal factors as a direct cause of stunting. Mothers who possess knowledge and practice exclusive breastfeeding from birth to six months are more likely to effectively fulfill the optimal nutritional requirements of their toddlers. On the other hand, a lack of maternal education and understanding of nutrition can result in inappropriate feeding practices, including the first intake of formula milk, tea water, or supplements prior to the baby reaching 6 months of age (12).

Research conducted at the Selopampang Health Center in Temanggung Regency indicates a correlation between exclusive breastfeeding and stunting. The findings suggest that children who do not receive exclusive breastfeeding are at a higher risk of experiencing stunting (8). Preventing stunting in toddlers involves ensuring that they receive adequate nutrition, which is essential for their optimal growth and development. One factor that can affect the nutritional requirements of toddlers is the practice of exclusive breastfeeding for their

first 6 months of life (13). This study focuses on research from the Sungai Kapih Health Center, which identified a significant correlation between the history of exclusive breastfeeding and the incidence of stunting in toddlers aged 24 to 60 months, indicated by a $p < 0.001$ value (14). In the same vein, research conducted in East Nusa Tenggara, Indonesia, indicates that exclusive breastfeeding is crucial in safeguarding children against stunting, particularly among low-income families. Research indicates that children who are exclusively breastfed demonstrate a reduced risk of stunting when compared to those who are not exclusively breastfed(15). (**Table 1**)

Children who get direct care from their biological mothers are less likely to experience stunting compared to those cared for by other family members. This concern arises from the observation that children who are directly cared for by their mothers tend to receive exclusive breastfeeding more consistently. Nonetheless, factors such as inadequate maternal education, time constraints and the notion that breast milk production can insufficiently pose challenges to the practice of exclusive breastfeeding (15). Research conducted in East Nusa Tenggara, Indonesia, has discovered prevalent misconceptions within the community. Notably, there is a belief that colostrum is detrimental and should therefore be discarded, as well as the notion that complementary feeding must start at the

age of 2 to 3 months. The practice of giving complementary feeding in addition to breastfeeding (MP-ASI) prematurely can increase the risk of stunting, as an infant's digestive system is not adequately prepared to process foods beyond breast milk(15). Exclusive breastfeeding plays a crucial role in promoting the linear growth of children. Breast milk provides essential energy, protein, fat, carbohydrates, and micronutrients, including vitamins and minerals, in proportions that are specifically tailored to meet the developmental needs of infants during their first six months of life. Moreover, breast milk is rich in antibodies and immunological components that serve to safeguard infants against infectious diseases.

Children who do not receive exclusive breastfeeding are typically introduced to supplementary foods or beverages at an earlier stage, which are often not hygienically prepared. This practice heightens the risk of infections, particularly diarrhea and acute respiratory infections (ARI). Recurrent infections can disrupt the absorption of nutrients, elevate energy requirements, and ultimately lead to growth retardation, commonly referred to as stunting. This aligns with the statement from the World Health Organization (2023), which emphasizes that exclusive breastfeeding for the first six months is an effective strategy for reducing the incidence of stunting. The World Health Organization advises that infants should receive breast

milk right after birth, with exclusive breastfeeding recommended for the initial six months of life. Following this period, it is suggested that babies be introduced to nutritionally balanced complementary foods while continuing to breastfeed until they reach two years of age or beyond. When exclusive breastfeeding is not practiced optimally, the likelihood of stunting may rise, particularly if it is not complemented by appropriate complementary feeding.

The research conducted in the nearby area of the Banjar I Health Center presented findings from a study involving 34 toddlers diagnosed with stunting. Notably, 8 of these toddlers continued to experience stunting despite having received exclusive breastfeeding. The analysis of statistical tests indicated that there was no significant association between a history of exclusive breastfeeding and the incidence of stunting ($p = 0.536$; $p > 0.05$). This study indicates that while exclusive breastfeeding plays a role in preventing stunting, it is not the sole factor. Other influential elements include maternal nutritional status, the quality of complementary feeding, economic conditions, and environmental health factors (16). (Table 2)

The Relationship Between Nutritional Status of Toddlers and the Incidence of Stunting in Toddlers at the UPTD of the Kemu Health Center, North Bengkulu

The nutritional status of toddlers is an important indicator to assess the growth

and development of children. The nutritional status of toddlers is determined by comparing body weight to height/height (BB/TB) based on anthropometric standards set by the Ministry of Health (2020). Toddlers with normal nutritional status have optimal growth and development opportunities, while toddlers with poor nutritional status are at high risk of experiencing linear growth retardation or stunting.

The nutritional status of toddlers serves as a crucial indicator for evaluating the growth and development of children. The nutritional status of toddlers is assessed by comparing their body weight to height (BB/TB), which is consistent with the anthropometric standards established by the Ministry of Health in 2020. Toddlers who maintain a normal nutritional status are afforded the best chances for optimal growth and development. In contrast, those with inadequate nutrition face a significant risk of linear growth retardation or stunting.

This study aligns with research conducted in Bandar Lampung, which identifies several determinants of nutritional status in toddlers. These determinants encompass nutritional intake, exclusive breastfeeding, immunization status, history of infectious diseases, socioeconomic conditions, birth weight history, and the number of children living in the family. The research further established that toddlers suffering from undernutrition, if not provided with prompt intervention, face a heightened

risk of developing severe wasting. Over time, this malnutrition may result in stunting among children. This indicates that malnutrition is a significant factor contributing to the development of stunting in toddlers (17).

This study's findings are further reinforced by research conducted at the Kaliwates Health Center in Jember. Among the 82 toddlers aged 24 to 72 months who were studied, it was found that 32% of those who were stunted also exhibited signs of undernourishment. The analysis conducted with the chi-square test resulted in a p-value of 0.04 (less than 0.05), indicating a significant relationship between the nutritional status of toddlers and the incidence of stunting. The research indicates that most stunted toddlers fall within the undernutrition category, whereas a minor proportion of stunted toddlers are classified as overnourished or obese (10).

This aligns with the research conducted in the working area of the Jatiasih Health Center in Bekasi. In a study involving a cross-sectional design with 173 toddlers aged 24 to 59 months, researchers discovered a significant relationship between nutritional status and the prevention of stunting ($p=0.001$). Further, it was found that toddlers with inadequate nutritional status were 4.048 times more likely to experience stunting compared to their counterparts under five years of age who had good nutritional status. This finding reinforces the significant impact of

nutritional status on height in relation to age (11). Research conducted at Posyandu Sabulmil in Lakmaras Village, South Lamaknen District, Belu Regency, East Nusa Tenggara, indicates a significant relationship between the nutritional status of toddlers and the incidence of stunting. The findings from the study, which involved a sample of 40 toddlers aged 2 to 4 years, indicated that a significant majority of the toddlers (62.5%) fell into the undernutrition category, while over half (55%) were identified as experiencing stunting in the short category. The analysis conducted with the Chi-Square test produced a $p = 0.000$ (< 0.05), which is less than the threshold of 0.05. This indicates that there is a significant relationship between nutritional status and the incidence of stunting (18). (Table 3)

Based on research conducted at the East City Health Center, this study emphasizes the significant impact of nutritional status on the growth and development of toddlers. Insufficient energy and protein consumption over an extended period can lead to children facing growth failure, often manifested as a reduced height or stunting. Toddlers who maintain a normal nutritional status are less likely to experience stunting, as their nutritional requirements are adequately fulfilled to support their growth and development(19). Research conducted at the East City Health Center documented instances in which toddlers, despite having a normal nutritional

status, still faced challenges with stunting. This indicates that, in addition to nutritional status, various other factors contribute, including a brief birth history and genetic influences (19).

CONCLUSION AND RECOMMENDATION

There is a significant relationship between the history of exclusive breastfeeding and the incidence of stunting in toddlers, indicated by a p -value of 0.000 (p -value < 0.05). Furthermore, a notable correlation exists between the nutritional status of toddlers and the incidence of stunting, indicated by a p -value of 0.008 (p -value < 0.05). Community health centers (*Puskesmas*) are expected to improve promotional and preventive efforts related to stunting prevention through exclusive breastfeeding programs and the monitoring of toddlers' nutritional status. Achieving this goal involves educating pregnant and breastfeeding mothers on the importance of exclusive breastfeeding during the initial six months, conducting regular nutritional assessments through integrated health posts (*Posyandu*), and providing specialized support for malnourished toddlers or those at risk of stunting.

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