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Association of Infectious Diseases and Low Birth Weight with Stunting among Toddlers

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ABSTRACT :

Background: Stunting is a chronic nutritional problem that remains a major public health challenge in Indonesia. Various factors may contribute to the occurrence of stunting, including a history of infectious diseases and low birth weight (LBW). This study aimed to analyze the relationship between a history of infectious diseases and LBW with the incidence of stunting among toddlers. **Methods**: This study employed a quantitative design with a cross-sectional approach. A total of 72 toddlers were selected using a purposive sampling technique in the working area of the Southeast Pontianak Community Health Center, Pontianak District. Data were collected through interviews using a questionnaire that had been tested for validity and reliability. Data analysis was conducted using univariate and bivariate analyses with the Chi-square test. **Results:** The results showed a significant relationship between a history of infectious diseases and the incidence of stunting (p = 0.03; OR = 2.9; 95% CI: 1.05–8.165). Toddlers with a history of infectious diseases had a 2.9 times greater risk of experiencing stunting compared with those without such a history. However, no significant relationship was found between low birth weight and stunting (p = 0.78; OR = 1.2; 95% CI: 0.32–2.35). **Conclusion:** A history of infectious diseases is a significant factor associated with stunting among toddlers. Therefore, stunting prevention efforts should focus on controlling infectious diseases, improving environmental sanitation, and strengthening maternal and child health services.

Keywords: infectious diseases, low birth weight, stunting

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1. INTRODUCTION

Stunting is a chronic nutritional problem that remains a major public health challenge, particularly in developing countries. Stunting is defined as a condition of growth failure in children resulting from chronic malnutrition, characterized by a height-for-age measurement that is more than two standard deviations below the median of the child growth standards established by the World Health Organization (WHO) (1). his condition reflects the cumulative impact of long-term nutritional deficiencies, recurrent infectious diseases, and unfavorable environmental conditions that affect child growth, particularly during the first 1,000 days of life, which begins from pregnancy until the child reaches two years of age (2).

According to the latest data from the WHO, in 2022 there were 148.1 million children (22.3%) worldwide who experienced stunting. The majority of global stunting cases occurred in Asia, while 43% of stunted children were found in Africa. Globally, more than one in five children under the age of five experience stunting, indicating that millions of children are unable to reach their optimal growth potential (2). Based on the results of the Indonesian

Nutritional Status Survey (SSGI) in 2024, the prevalence of stunting among toddlers in Indonesia was reported to be 19.8%. This figure shows a decrease compared to the previous year, which was 21.5% in 2023, representing a decline of approximately 1.7 percentage points (3). In absolute numbers, this prevalence is equivalent to approximately 4.48 million toddlers experiencing stunting in Indonesia. This decline indicates that various interventions implemented by the government and multiple sectors have had a positive impact on accelerating stunting reduction efforts. Nevertheless, stunting remains a significant public health challenge that requires continuous and sustainable interventions(4).

Nutritional problems in children can affect their quality of life in both the short and long term (3). Chronic malnutrition during the early stages of life can hinder the development of brain structure and function, which play an important role in learning processes, memory, and cognitive abilities in children (5). Several studies have shown that children who experience stunting are at a higher risk of developmental delays in cognitive function, language ability, and academic performance compared to children with normal nutritional status. Stunting is also associated with delays in overall child development, including social and emotional development. Children who experience stunting are more likely to experience developmental delays during early childhood, which may affect their social adaptability and school readiness (6). Furthermore, stunting may lead to suboptimal physical growth and impaired motor development due to prolonged nutritional deficiencies (7). Individuals who experienced stunting during childhood tend to have lower educational attainment, limited cognitive abilities, and reduced work productivity compared with those who did not experience stunting (8).

The prevention and control of stunting have become important priorities in efforts to improve public health and community well-being. Preventing stunting requires a comprehensive and sustainable approach. Interventions should not only focus on fulfilling children's nutritional needs but also include improvements in maternal health, environmental sanitation, access to health services, and education regarding appropriate infant and young child feeding practices. Through integrated and coordinated efforts, it is expected that the prevalence of stunting can be reduced so that children are able to grow and develop optimally and reach their full potential. The occurrence of stunting is influenced by various multifactorial determinants. In general, the causes of stunting can be categorized into direct and indirect factors. Direct factors include inadequate nutritional intake and recurrent infectious diseases in children. Infectious diseases such as diarrhea and respiratory infections can worsen a child’s nutritional status by increasing energy requirements while simultaneously decreasing appetite and impairing nutrient absorption. In addition, maternal nutritional status during pregnancy plays a crucial role in determining fetal growth. Mothers who experience chronic energy deficiency or anemia during pregnancy are at risk of giving birth to infants with low birth weight, which can subsequently increase the risk of stunting in children (1).

Meanwhile, indirect factors include various conditions related to family and socioeconomic environments. These factors include low maternal education, limited access to health services, poor environmental sanitation, and inappropriate infant and young child feeding practices (2). Other contributing factors include difficulties in accessing adequate food supplies (9). Mothers with limited knowledge about nutrition and child care practices are reported to be up to ten times more likely to have children who experience stunting compared with mothers who possess adequate knowledge (10).

Previous studies have shown that a history of infectious diseases among toddlers is significantly associated with the incidence of stunting. Children who frequently experience infectious diseases have a higher risk of developing stunting compared with those without such a history. Several studies reported that toddlers with a history of infectious diseases have approximately three times greater odds of experiencing stunting than those without infections (11) (12). In contrast, some studies reported that mid-upper arm circumference and a history of anemia during pregnancy were not proven to be risk factors. These findings emphasize the importance of maternal health and adequate nutritional intake during the early stages of a child’s life. Another study found that although 85.6% of stunted toddlers had a birth weight greater than 2500 grams, there was still a significant association between birth weight and the incidence of stunting in children ($p = 0.001$). Children born with a birth weight of less than 2500 grams had a 3.3 times higher risk (95% CI: 1.6–6.186) of experiencing stunting compared with children born with normal birth weight (13).

Although many studies have examined factors associated with stunting among toddlers, most research has focused primarily on general nutritional factors such as dietary intake, maternal nutritional status, and infectious diseases. Some studies have also highlighted the role of socioeconomic conditions, environmental sanitation, and maternal education as important determinants of stunting (2) (1). However, the findings indicate that the causes of stunting are multifactorial and may vary across regions.

In Indonesia, the prevalence of stunting remains a considerable public health problem, although it has shown a decreasing trend in recent years. Based on the 2024 Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting among toddlers in Indonesia remains relatively high at 19.8%, indicating that stunting prevention continues to be a priority in national health development programs (3). Based on these conditions, there is still a research gap related to the identification of factors associated with stunting among toddlers at the community or regional level. This study is expected to provide a clearer and more comprehensive understanding of the factors influencing stunting incidence. Therefore, research on factors associated with stunting in Pontianak City is important to obtain more specific and contextual information that can serve as a basis for planning effective stunting prevention programs.

2. METHOD

This study employed a quantitative observational design with a cross-sectional approach to analyze the relationship between several risk factors, namely parenting patterns, history of infectious diseases, and low birth weight (LBW), and the incidence of stunting among toddlers. The sample consisted of 72 toddlers who were selected using a purposive sampling technique. The study was conducted in the working area of the Southeast Pontianak Community Health Center, Pontianak District. The sample consisted of 72 toddlers who were selected using a purposive sampling technique. The study was conducted in the working area of the Southeast Pontianak Community Health Center, Pontianak District. Data were collected through interviews using a structured questionnaire that had been tested for validity and reliability. The data analysis consisted of univariate and bivariate analyses. Univariate analysis was performed to describe the distribution of each variable using frequency distributions, while bivariate analysis was conducted using the Chi-square test to examine the relationship between the independent variables and the incidence of stunting. This study had undergone ethical review and received Ethical Clearance approval with the number: 158/II.I.AU.U/KET.ETIK/XI/2025. Prior to data collection, informed consent was obtained from all respondents, and the researchers ensured that ethical principles were maintained throughout the research process.

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1 Analysis Univariate

Based on univariate data analysis, the research results were obtained as written in Table 1 below.

Table 1. Overview of respondent characteristics

Variables	n=72	
	f	%
Gender		
Male	32	44.4
Female	40	55.6
Stunting Status		
Stunted	49	68.1
Not stunted	23	31.9
Age category		
Infant	9	12.5
Toddler	63	87.5
History of infectious disease		
Yes	22	30.6

No	50	69.4
Birth weight		
Low birth weight	33	45.8
Normal	39	54.2

Source: Primary data 2025

The characteristics of respondents presented in Table 1 show that the majority of the respondents were female, accounting for 40 children (55.6%), while 32 children (44.4%) were male. Based on age category, most respondents were classified as toddlers, with 63 children (87.5%), whereas 9 children (12.5%) were infants. Regarding nutritional status, the majority of children were classified as stunted, totaling 49 respondents (68.1%), while 23 respondents (31.9%) were not stunted. In terms of health history, 22 toddlers (30.6%) had experienced infectious diseases, whereas 50 toddlers (69.4%) had no history of infectious diseases. Regarding nutritional status, the majority of children were classified as stunted, totaling 49 respondents (68.1%), while 23 respondents (31.9%) were not stunted. In terms of health history, 22 toddlers (30.6%) had experienced infectious diseases, whereas 50 toddlers (69.4%) had no history of infectious diseases. Furthermore, based on birth weight, 33 toddlers (45.8%) were born with low birth weight, while 39 toddlers (54.2%) had normal birth weight. Furthermore, based on birth weight, 33 toddlers (45.8%) were born with low birth weight, while 39 toddlers (54.2%) had normal birth weight.

3.1.2 Bivariate Analysis

Bivariate analysis was conducted to examine the relationship between a history of infectious diseases and low birth weight (LBW) with the incidence of stunting using the Chi-square test. Based on the data analysis, the research findings are presented in Table 2.

Table 2. Association of infectious diseases and low birth weight with stunting among toddlers

Variable	Stunting status				p	OR	95%CI
	Stunting		No stunting				
	f	%	f	%			
History of Infectious disease							
Yes	32	44.4	9	12.5	0.03	2.9	1.05-8.165
No	17	23.6	14	19.4			
Birth Weight							
Low birth weight	23	31.9	10	13.9	0.78	1.2	0.32-2.35
Normal	26	36.1	13	18.1			

Source: Primary data 2025

The results showed that among respondents with a history of infectious diseases, 32 children (44.4%) were classified as stunted and 9 children (12.5%) were not stunted. Meanwhile, among respondents without a history of infectious diseases, 17 children (23.6%) were classified as stunted and 14 children (19.4%) were not stunted. The statistical analysis indicated a significant relationship between a history of infectious diseases and the incidence of stunting ($p = 0.03$; $p < 0.05$). The odds ratio (OR) was 2.9 (95% CI: 1.05–8.165), indicating that children with a history of infectious diseases had 2.9 times higher odds of experiencing stunting compared with children who did not have a history of infectious diseases.

The results also showed that among respondents with low birth weight, 23 children (31.9%) were classified as stunted and 10 children (13.9%) were not stunted. Meanwhile, among respondents with normal birth weight, 26 children (36.1%) were classified as stunted and 13 children (18.1%) were not stunted. The statistical analysis showed that there was no significant relationship between birth weight and the incidence of stunting ($p = 0.78$; $p > 0.05$). The estimated odds ratio was 1.2 (95% CI: 0.32–2.35), indicating that children with low birth weight had 1.2 times higher odds of experiencing stunting compared with those with normal birth weight; however, this association was not statistically significant.

3.2 Discussion

The results of this study showed a significant relationship between a history of infectious diseases and the incidence of stunting among toddlers. This finding indicates that toddlers who had a history of infectious diseases had 2.9 times higher odds of experiencing stunting compared with those who did not have such a history. These findings suggest that infectious diseases are an important factor contributing to growth disturbances in children. Biologically, infectious diseases may affect child growth through several mechanisms, including decreased appetite, increased energy requirements, and impaired nutrient absorption in the digestive tract. Recurrent infections such as diarrhea, acute respiratory infections (ARI), and parasitic infections can lead to malabsorption of nutrients and chronic inflammation, which may ultimately inhibit linear growth in children (14). This condition may prevent children's nutritional needs from being adequately met, thereby increasing the risk of stunting in the long term.

The results of this study are consistent with several previous studies indicating that a history of infectious diseases is an important risk factor for the incidence of stunting in children. Previous research has shown that infectious diseases such as diarrhea and acute respiratory infections (ARI) have a significant relationship with stunting among toddlers (15). In addition, other studies have reported that children who frequently experience infectious diseases have a higher risk of growth disturbances compared with children who do not experience infections (16). This occurs because infections may worsen a child’s nutritional status by increasing metabolic demands and reducing nutritional intake during illness.

These findings are also supported by previous studies indicating that infectious diseases in children are among the contributing factors to chronic nutritional problems, including stunting. Such studies explain that recurrent infections can aggravate existing nutritional deficiencies, thereby affecting children’s linear growth. Therefore, efforts to prevent infectious diseases through improved environmental sanitation, complete immunization coverage, and better access to health services are important strategies for stunting prevention (17).

In contrast, the results of this study showed that there was no significant relationship between low birth weight (LBW) and the incidence of stunting. Although children with a history of LBW had 1.2 times higher odds of experiencing stunting, this association was not statistically significant. The absence of a significant relationship between LBW and stunting in this study may be influenced by environmental and postnatal care factors that affect child growth. Infants born with low birth weight may still experience catch-up growth if they receive adequate nutritional intake, appropriate feeding practices, and optimal health care during their growth period. Therefore, postnatal factors such as adequate nutrition, exclusive breastfeeding, and the prevention of infectious diseases may play an important role in improving the growth of children born with low birth weight (18).

However, several other studies have reported that low birth weight (LBW) remains an important risk factor for the incidence of stunting. Infants with low birth weight generally have limited nutritional reserves and slower growth compared with infants born with normal birth weight, which increases their risk of experiencing growth disturbances during toddlerhood (19). Low birth weight is considered one of the factors that plays an important role in the occurrence of stunting in children. Previous studies have shown that LBW is a major factor associated with the incidence of stunting among children aged 12–23 months in Indonesia ($p = 0.001$) (20). Infants born with low birth weight have limited nutritional reserves and slower growth from the early stages of life, which increases the risk of impaired linear growth during infancy(1). he results of other studies also indicate that children with a history of LBW are more likely to experience stunting compared with children born with normal birth weight(21) (22). Therefore, although this study did not find a statistically significant relationship between LBW and the incidence of stunting, LBW should still be considered as a potential determinant in the occurrence of stunting among toddlers.

The findings of this study also indicate that a history of infectious diseases is an important factor associated with the incidence of stunting among toddlers. Recurrent infections can worsen a child’s nutritional status through several mechanisms, including decreased appetite, increased metabolic demands, and impaired absorption of nutrients required for optimal growth. These conditions may lead to a sustained deficit of energy and essential nutrients, thereby inhibiting children's linear growth. On the other hand, low birth weight in this study did not

show a significant association with stunting. This finding suggests that postnatal factors such as adequate nutritional intake, exclusive breastfeeding practices, parenting patterns, and access to health services may influence child growth and enable catch-up growth among infants born with low birth weight. Therefore, stunting prevention efforts should be implemented comprehensively through integrated nutritional interventions, infectious disease control, improved environmental sanitation, and strengthened maternal and child health services.

4. CONCLUSION

The results of this study indicate a significant relationship between a history of infectious diseases and the incidence of stunting among toddlers (p = 0.03; OR = 2.9; 95% CI: 1.05–8.165). Toddlers who had a history of infectious diseases were almost three times more likely to experience stunting compared with those who did not have such a history. In contrast, low birth weight (LBW) did not show a statistically significant relationship with the incidence of stunting in this study (p = 0.78; OR = 1.2; 95% CI: 0.32–2.35). These findings indicate that children's health conditions, particularly a history of infectious diseases, play an important role in growth disturbances among toddlers. Therefore, stunting prevention efforts should be carried out comprehensively through the control of infectious diseases, improvement of environmental sanitation, and strengthening of maternal and child health services.

5. SUGGESTION

Future researchers are encouraged to expand the study variables by including environmental factors such as sanitation conditions and access to clean water. In addition, the use of a longitudinal or cohort study design is recommended to observe the development of stunting over a longer period of time. This approach may provide stronger evidence regarding the causal relationship between infectious diseases and stunting. Furthermore, future studies should incorporate multivariate analysis to control for potential confounding variables, such as family socioeconomic status, in order to improve the generalizability of the research findings.

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7. REFERENCES

1. World Health Organization. *Child growth standards and the identification of stunting*. Geneva: WHO; 2024.
2. UNICEF, World Health Organization, World Bank. *Levels and trends in child malnutrition: UNICEF/WHO/World Bank joint child malnutrition estimates – 2023 edition*. New York: UNICEF; 2023.
3. Kementerian Kesehatan Republik Indonesia. *Hasil Survei Status Gizi Indonesia (SSGI) 2024*. Jakarta: Kementerian Kesehatan RI; 2025. Available from: https://www.kemkes.go.id
4. Kementerian Koordinator Bidang Pembangunan Manusia dan Kebudayaan Republik Indonesia. *Prevalensi stunting tahun 2024 turun menjadi 19,8 persen*. Jakarta: Kemenko PMK; 2025. Available from: https://www.kemenkopmk.go.id
5. Sideropoulos V, Draper A, Munoz-Chereau B, Ang L, Dockrell J. Childhood stunting and cognitive development: A meta-analysis. J Glob Health. 2025;15: 04257. doi:10.7189/jogh.15.04257
6. *E* Jeong J, Franchett E, Ramos de Oliveira CV, Rehmani K, Yousafzai AK. Early childhood development and stunting in low- and middle-income countries. JAMA Netw Open. 2025;8(1): 2462263. doi:10.1001/jamanetworkopen.2024.62263
7. Manggala AK, Kenwa KWM, Kenwa MML, Sakti AAGDPJ, Sawitri AAS. Risk factors of stunting in children aged 24–59 months. Paediatr Indones. 2018;58(5):205-212. doi:10.14238/pi58.5.2018.205-212
8. Lestari E, Siregar A, Hidayat AK, Yusuf AA. Childhood stunting and adult cognitive outcomes: Evidence from Indonesia. PLoS One. 2024;19(5): 0295380. doi: 10.1371/journal.pone.0295380

9. Rosha BC, Susilowati A, Amaliah N, Permanasari Y. Penyebab langsung dan tidak langsung stunting di lima kelurahan di Kecamatan Bogor Tengah. Bul Penelit Kesehat. 2019;47(3):169-182. doi:10.22435/bpk.v47i3.2264
10. Ramdhani A, Handayani H, Setiawan AS. Hubungan pengetahuan ibu dengan kejadian stunting. Semin Nas Kesehat. 2020;2(1):28-35.
11. Yulnefia, Sutia M. Hubungan riwayat penyakit infeksi dengan kejadian stunting pada balita usia 24–36 bulan di wilayah kerja Puskesmas Tambang Kabupaten Kampar. Jambi Med J. 2022;10(1):154-163. doi:10.22437/jmj.v10i1.10410
12. Amalina A, Ratnawati LY, Bumi C. Hubungan riwayat diare dan infeksi saluran pernapasan akut dengan kejadian stunting pada balita. J Midwifery. 2023;11(2):112-118.
13. Anggraini ND. Analisis faktor risiko kejadian stunting pada anak usia 12–59 bulan di Provinsi Nusa Tenggara Barat. Med Technol Public Health J. 2019;3(1):86-93. doi:10.33086/mtphj.v3i1.649
14. Prendergast AJ, Humphrey JH. The stunting syndrome in developing countries. Paediatr Int Child Health. 2019;39(4):239-247. doi:10.1080/20469047.2019.1604790
15. Suratri MAL, Indriasih E, Warouw TS, et al. The relationship between infectious diseases and stunting among toddlers in Indonesia. Iran J Nurs Midwifery Res. 2025;30(6):745-752. doi: 10.4103/ijnmr.ijnmr_214_24
16. Ijaiya MA, Anjorin S, Uthman OA. Quantifying the increased risk of illness in malnourished children: A global meta-analysis. Glob Health Res Policy. 2024; 9: 29. doi:10.1186/s41256-024-00329-1
17. Jokhu LA, Syauqy A. Determinants of concurrent wasting and stunting among children aged 6–23 months in Indonesia. Nutrition. 2024;122: 112357. doi: 10.1016/j.nut.2024.112357
18. Victora CG, Christian P, Vidaletti LP, et al. Revisiting maternal and child undernutrition in low- and middle-income countries: Variable progress towards an unfinished agenda. Lancet. 2021;397(10282):1388-1399. doi:10.1016/S0140-6736(21)00394-9
19. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet. 2021;382(9890):427-451. doi:10.1016/S0140-6736(13)60937
20. Ayastami A, Sari K, Rahmawati D. Determinants of stunting among children aged 12–23 months in Indonesia. J Public Health Res. 2022;11(3):227-234. doi:10.4081/jphr.2022.2273
21. Titaley CR, Ariawan I, Hapsari D, Muasyaroh A, Dibley MJ. Determinants of the stunting of children under two years old in Indonesia: A multilevel analysis of the 2013 Indonesia Basic Health Survey. Nutrients. 2019;11(5):1106. doi:10.3390/nu11051106
22. Beal T, Tumilowicz A, Sutrisna A, Izwardy D, Neufeld LM. A review of child stunting determinants in Indonesia. Matern Child Nutr. 2018;14(S4):12617. doi:10.1111/mcn.12617

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