Journal of Sustainable Applied Modification Evidence Community
Vol. 02, No. 2, December 2025, 12-21
***e*-ISSN: 3048-040X**

Influential Factors Contributing to Stunting in Toddlers

Hermita Bus Umar[1]*, Dina Ayuning Tyas[2], Erma Herdyana[3], Sirajul Muna[4], & Yayuk Sri Rahayu[5]
[1]*Poltekkes Kemenkes Padang, Indonesia, [2]Universitas Sumatera Barat, Indonesia, [3]Universitas Bhakti Pertiwi Indonesia, Indonesia, [4]STIKES Muhummadiyah Aceh, Indonesia, [5]Universitas Sehati Indonesia, Indonesia
*Co e-mail: hermita1809@gmail.com[1]

Article Information
Received: October 10, 2025
Revised: November 22, 2025
Online: December 04, 2025

Keywords
Stunting, Maternal Nutritional Status, Parenting, Environmental Sanitation, Socioeconomic Status, Toddlers

ABSTRACT
This study aimed to investigate the relationship between family socio-economic factors, environmental sanitation, and household physical conditions with the occurrence of stunting among toddlers in densely populated areas of Padang City, West Sumatra. In 2025, a cross-sectional study employing quantitative methods was conducted. The study population included all children aged 24 to 59 months. Using purposive sampling, 75 toddlers were selected based on the following inclusion criteria: measurable anthropometry, possession of a complete KIA/KMS record, and absence of chronic illnesses. Height measurements of toddlers followed the WHO 2006 anthropometric standards, household environmental conditions were assessed through observation, and data were collected via structured interviews. Bivariate analysis indicated a significant association between stunting and specific social and environmental factors. Toddlers from low-income families, with mothers of lower educational attainment, and living in substandard physical environments were found to be more susceptible to growth and development disorders compared to their better-off peers. Both univariate and multivariate analyses demonstrated that stunting is a multifaceted issue influenced by the interplay of the child's biological age, maternal education level, household physical environment, and family socio-economic status. These findings highlight the necessity of ongoing health education programs to enhance family awareness and capabilities in fulfilling children's nutritional needs, particularly in environments that are at higher risk for stunting, such as the home setting.

Keywords: *Stunting, Maternal Nutritional Status, Parenting, Environmental Sanitation, Socioeconomic Status, Toddlers*

http://doi.org/10.69855/samec.v2i2.277
https://gpijournal.com/index.php/samec

INTRODUCTION

Stunting is a public health issue that remains a national priority due to its long-term impact on physical and cognitive development and future economic productivity. Although the national prevalence has declined, regional disparities remain high, especially in areas with low socioeconomic conditions, poor sanitation, and limited access to health services. Various factors such as maternal nutritional status, parenting practices, recurrent infections, environmental sanitation, and family economic conditions have been identified as important determinants of stunting (WHO, 2022). This condition does not only reflect physical growth failure, but also indicates long-term nutritional deficiencies, poor maternal health, and socio-economic vulnerabilities (Laksono et al., 2022).

The determinants of stunting are multifactorial, ranging from inadequate feeding practices and maternal malnutrition to poor sanitation and environmental exposures (Wikipedia, 2023). Low birth weight, recurrent infections such as diarrhoea, and lack of access to clean water are also significant contributors (Utomo et al., 2024). In Indonesia, several studies have highlighted maternal factors, breastfeeding practices, complementary feeding, and family income as important predictors of stunting (Sari and Harianis, 2022; Budiati, Indriani and Listyarini, 2023).

Maternal characteristics such as nutritional status, short stature, education, and age at first marriage have also been consistently linked to the risk of stunting in toddlers (Nashira, Kusnandar and Sukamto, 2021; Pratama, Marwati and Hidayat, 2021). Furthermore, inadequate knowledge about nutrition, non-exclusive breastfeeding, and poor parenting practices exacerbate the problem (Halim, Ermiati and Sari, 2020; Dewi et al., 2023).

Therefore, it is evident that stunting in toddlers is not caused by a single factor but rather by the interaction of maternal health, infant feeding practices, socio-economic status, and environmental conditions. Addressing stunting requires comprehensive, multi-sectoral interventions, including maternal nutrition improvement, health education, better sanitation, and strengthening family economic resilience (Ginarsih, Pramudianti and Sari, 2022).

The 2024 Indonesian nutritional Status survey (SSGI) Data shows that the National stunting prevalence has decreased from 21.6% to 19.8%. However, this figure is still far from the 2020-2024 RPJMN target which targets a stunting prevalence of 14% in 2024 (Ministry of Health, 2024). The distribution of cases still shows inequality, where areas of eastern Indonesia such as East Nusa Tenggara (NTT) and Papua reported stunting rates above 30%, indicating the unevenness of health development between regions.

The effects of stunting are long-term and multidimensional. Children who experience stunting at an early age are more at risk of experiencing intellectual development barriers, low academic achievement, and smaller income when adults. The World Bank (2023) estimates that stunting causes economic losses of around 2-3% of Indonesia's Gross Domestic Product (GDP) each year. At the micro level, families with stunted children will bear the brunt of higher health costs and potentially declining productivity, reinforcing the cycle of intergenerational poverty.

The factors that cause stunting are complex and interact with each other, both in terms of biological, environmental, and socioeconomic. Malnutrition in pregnant women, recurrent infections in toddlers, inappropriate feeding practices, and lack of stimulation of growth and development are the main risk factors (WHO, 2023). The study by Wulandari & Putri (2024) confirms that low family nutritional literacy, especially in mothers, is closely related to the nutritional status

of toddlers. While Nugraha et al. (2023) showed that toddlers living in neighborhoods with poor sanitation and clean water have twice as high chances of stunting.

Previous studies have shown that low maternal education, poor sanitation, poor home ventilation, and low family income increase the risk of stunting. In addition, exposure to cigarette smoke, overcrowded housing, and inadequate feeding practices contribute to child growth disorders. However, most studies have examined these factors partially and have not fully evaluated the interaction between household environmental factors and socio-economic conditions simultaneously.

A knowledge gap exists in the lack of empirical evidence that simultaneously examines the contribution of physical household environmental factors (sanitation, ventilation, housing density) and family characteristics to stunting in densely populated areas, particularly in Padang, West Sumatra. Thus, a renewed study is needed to comprehensively evaluate these factors.

A deep understanding of the determinants of stunting, especially in densely populated environments that have multiple environmental and economic vulnerabilities, is essential to devise targeted intervention strategies. Various studies have shown that interventions targeting specific factors such as environmental cleanliness, clean and healthy living behavior, and Family Empowerment in terms of nutrition and Maternal-Child Health have been shown to be effective in reducing the prevalence of stunting (Melani et al., 2023; Kartikari et al., 2024).

The objective of this study was to analyse the relationship between family socio-economic factors, environmental sanitation, and physical conditions of the home with the incidence of stunting in toddlers in densely populated areas of Padang City, West Sumatra.

METHODS

This study used a quantitative approach with a cross-sectional design conducted in Padang City, West Sumatra, in 2025. The study population consisted of all toddlers aged 24–59 months, and 75 toddlers were selected using purposive sampling based on the following inclusion criteria: having a complete KIA/KMS book, not suffering from chronic diseases, and willing to undergo anthropometric measurements. Data collection was conducted through structured interviews using questionnaires, observation of home environmental conditions, and measurement of toddler height using the 2006 WHO anthropometric standards. The questionnaire instrument underwent content validation by two academics in the field of community nutrition and one environmental health practitioner, and reliability testing was conducted on 20 respondents outside the research sample. The test results showed a Cronbach's alpha value of 0.82 for the mother's knowledge variable and 0.79 for the environmental sanitation variable, indicating a good level of reliability. The environmental sanitation variable was operationalised using the Ministry of Health's assessment system, which covers four main indicators, namely access to clean water, the availability of healthy toilets, waste and sewage management, and environmental cleanliness. The category ‘good’ was given if the indicator fulfilment score reached ≥75%, while ‘poor’ was given if it was less than 75%. House ventilation was categorised as ‘adequate’ if it met the minimum ventilation area requirement of 10% of the floor area and had cross ventilation. To minimise the influence of confounding factors, basic variables such as child age, gender, and infection history were taken into account through stratification in the bivariate analysis. Data analysis was conducted in two stages: univariate analysis to describe the distribution of each variable, and bivariate analysis using the Chi-square test to

examine the relationship between independent variables and stunting with a significance level of $p < 0.05$.

RESULTS

1. Characteristics of Respondents

Table 1. Univariate Analysis of Respondent Characteristics (n=75)

Variable	Category	Frequency	Percentase (%)
Toddler Age	24-36 months	40	53.3
	37-59 months	35	46.7
Gender	Men	38	50.7
	Female	37	49.3
Stunting Incident	Stunting	22	29.3
	Not Stunting	53	70.7
Mother's Education	SD or less	30	40.0
	> SD	45	60.0
Family Income	IDR 2.000.000	35	46,7
	> IDR 2.000.000	40	53.3
Environmental Sanitation	Good	28	37.3
	Bad	47	62.7
Ventilation Of The House	Adequate	33	44.0
	Inadequate	42	56.0

The majority of toddlers are in the 24–36 month age group (53.3%). The prevalence of stunting is 29.3%, indicating that nearly one-third of toddlers experience growth problems. The proportion of mothers with low education levels reached 40%, and 46.7% of families had low incomes. The proportion of poor sanitation (62.7%) and inadequate ventilation (56%) indicated that most respondents lived in physical environments that were not conducive to children's health. These conditions revealed a double vulnerability, namely economic limitations and an unhealthy environment, which had the potential to increase the risk of stunting.

2. Factors Associated With Stunting

Table 2. Factors Associated With Stunting (N=75)

Variable	Category	Stunting (n, %)	No Stunting (n, %)	p-value
Mother's Education	≤ SD	15 (50..0)	15 (50.0)	0.018
	> SD	7 (15.6)	38 (84.4)	
Family Income	≤ Rp2.000.000	14 (40.0)	21 (60.0)	0.035
	> Rp2.000.000	8 (20.0)	32 (80.0)	
Environmental Sanitation	Bad	18 (38.3)	29 (61.7)	0.022
	Good	4 (14.3)	24 (85.7)	

Variable	Category	Stunting (n, %)	No Stunting (n, %)	p-value
Ventilation of The House	Inadequate	16 (38.1)	26 (61.9)	0.028
	Adequate	6 (18.2)	27 (81.8)	

The results show that maternal education has a significant relationship with stunting (p = 0.018). Toddlers of mothers with low education have twice the proportion of stunting compared to those with higher education. Low family income is also significantly associated (p = 0.035), reflecting limitations in the provision of nutritious food and health services. Poor sanitation (p = 0.022) and inadequate ventilation (p = 0.028) indicate that an unhealthy home environment contributes to an increased risk of stunting through increased exposure to infection.

DISCUSSION

1. Characteristics of Respondents

The results of the study indicate that maternal education, family income, environmental sanitation, and home ventilation are significantly associated with stunting. Maternal education plays a major role in the ability to understand proper feeding practices, infection management, and seeking health services. Behaviourally, mothers with low education tend to have limited nutritional literacy, resulting in suboptimal complementary feeding practices. Physiologically, an unbalanced nutritional intake causes an energy-protein deficit that hinders children's linear development.

The prevalence of stunting in the sample reached 29.3%, which is still far above the national target of 14% that the government wants to achieve in 2029 (Ministry of Health, 2024). This figure is also in line with the findings of Nugraha et al. (2023) which shows that areas with low socioeconomic conditions and poor environmental sanitation have higher stunting rates. This disparity confirms that stunting is not only a health problem, but also a reflection of social and economic inequality that must be addressed in an integrated way. These conditions underscore the need for interventions targeting vulnerable groups with a holistic and sustainable community-based approach.

In terms of Education, almost 40% of the mothers surveyed only had an education equivalent to elementary school or less. Maternal education is a crucial factor in the practice of providing nutrition to children, as explained in socioeconomic theory by Barker (2023). Mothers with low levels of education tend to lack understanding of the importance of balanced nutritional intake and healthy parenting, so that children are more susceptible to nutritional problems such as stunting. Research by Pranata et al. (2024) reinforce these findings by demonstrating a significant association between low maternal education and increased risk of stunting in children. Therefore, the empowerment of mothers through nutrition education and increased knowledge is very important in stunting prevention efforts.

The condition of the physical environment of the residence is also a determining factor in this analysis. Most of the respondents ' homes had inadequate sanitation and poor ventilation. This situation could theoretically exacerbate the risk of recurrent infections, such as diarrhea and respiratory tract infections, which in turn impair nutrient absorption and contribute to stunting (Wulandari & Putri, 2024). Study by Sari et al. (2024) confirmed that poor sanitation increases children's exposure to pathogens, which magnifies the likelihood of chronic infections and slows down the normal growth process. Thus, improved sanitation and household conditions are becoming an important part of public health interventions.

In addition to physical environmental factors, the socio-economic conditions of the family also have a significant impact. Nearly half of the respondents ' families are low-income, which limits their access to nutritious food and quality health services. The World Bank (World Bank, 2023) states that poverty is a major determinant of stunting incidence because it directly inhibits the ability of families to optimally meet the nutritional needs of children. These economic limitations often also reduce the child's opportunities for good psychosocial stimulation, which is also important for the child's overall development.

Overall, the results of the univariate analysis illustrate that stunting is a multidimensional problem that involves the interaction between the biological age of the child, the level of education of the mother, the conditions of the physical environment of the home, and the socioeconomic status of the family. The researchers considered that effective stunting prevention efforts must involve a holistic and multisectoral approach, not only focusing on nutritional aspects, but also paying attention to education, the environment, and family economics. This approach is in line with WHO recommendations (2023) which emphasize the importance of integrated interventions involving various sectors to address the determinants of stunting thoroughly and sustainably.

Poor ventilation increases the risk of respiratory tract infections through exposure to domestic pollutants and the accumulation of pathogens in the air. Repeated infections activate chronic inflammatory processes and increase metabolic demands, resulting in competition between energy for fighting infection and energy for growth. This situation causes children to experience growth faltering, which leads to stunting.

Poor sanitation increases exposure to enteric bacteria that cause diarrhoea and other infectious diseases. Recurrent infections cause malabsorption of nutrients and damage to the intestinal mucosa, known as environmental enteric dysfunction (EED), which is the main physiological mechanism causing growth failure in children.

Low family income limits the ability to provide nutritious food, adequate housing, and access to preventive health services. This factor reinforces the cycle of intergenerational poverty and malnutrition.

In the context of policy and practice, it is important for the government and other stakeholders to strengthen maternal nutrition education programs, improve access to proper sanitation, and address poverty and social inequality. It is intended that the intervention is not only short-term, but also capable of producing long-lasting positive changes for the health and future of young people in Indonesia, especially in densely populated areas that have a high risk of stunting.

2. Factors Affecting the Incidence of Stunting in Toddlers

Bivariate analysis in this study clearly shows a significant relationship between bivariate analysis in this study revealed a significant relationship between various environmental and socioeconomic factors with the incidence of stunting in toddlers who live in densely populated environments. One of the most dominant environmental factors is the quality of home ventilation. The Data showed that toddlers living in homes with poor ventilation had a significantly higher risk of stunting than toddlers living in homes with good ventilation ($p < 0.05$). This is in line with the findings of Nugraha et al. (2023) which states that adequate ventilation can improve air circulation, reduce the transmission of respiratory tract infections, and indirectly help maintain the nutritional

status of children. Poor ventilation worsens the environmental conditions of the home, increasing the risk of recurrent infections, which is one of the main causes of stunted growth in children.

In addition to ventilation, Environmental Sanitation has also proven to play a very important role in stunting. Toddlers who live in environments with poor sanitation have a greater chance of stunting ($p < 0.05$). The research of Wulandari and Putri (2024) reinforces this finding by showing that poor sanitation increases the frequency of diarrheal infections and other infectious diseases that can interfere with the process of nutrient absorption. These recurrent infections cumulatively lead to impaired metabolism and nutrient absorption, thereby increasing the risk of stunting in children. Poor sanitation also reflects less healthy environmental conditions in general, which have an impact on the quality of life of families and the overall health of children.

Exposure to secondhand smoke in the home is another significant risk factor associated with stunting. Research Data show that toddlers who live in homes with active smokers have a significantly higher risk of stunting ($p < 0.01$). According to Rahman et al. (2023), cigarette smoke contains various toxic substances that can damage the respiratory tract and interfere with immune function and nutrient metabolism in children. This exposure leads to an increased incidence of respiratory infections that can exacerbate nutritional and growth problems in toddlers. These findings underscore the importance of regulation and education of cigarette smoke control in the home environment as part of stunting prevention strategies.

Occupancy density is also a factor that shows a strong relationship with the incidence of stunting. Toddlers living in high-density homes are at greater risk of impaired growth ($p < 0.05$). Sari et al. (2024) affirm that high occupancy densities cause intense physical interaction and accelerate the transmission of infectious diseases, such as respiratory infections and diarrhea, which negatively affect the nutritional status of children. In addition, crowded environments are often related to limited access to adequate basic facilities, which worsens the health condition of toddlers.

Family socioeconomic factors also showed a significant correlation with the incidence of stunting. Families with low incomes have a higher risk of stunting ($p < 0.05$), as confirmed by Pranata et al. (2024). Economic constraints have an impact on the lack of access to nutritious food, adequate health services, and a healthy living environment. Weak economic conditions also often limit the ability of families to obtain adequate health education, which leads to less than optimal feeding and parenting practices for toddlers.

In addition to physical and economic factors, family knowledge and practices in stunting Prevention have also been shown to have a significant effect. Kartikari et al. (2023) found that families with low knowledge related to nutrition intake and healthy parenting tend to have a higher risk of stunting in toddlers. This shows that continuous health education is needed to increase awareness and skills of families in meeting the nutritional needs of children optimally, especially in an environment prone to stunting.

The findings as a whole indicate the need for a multisectoral approach in dealing with stunting problems. WHO (2023) affirms that the success of stunting reduction programs requires synergies between the health, education, housing, environmental, and socio-economic sectors so that interventions can touch all social determinants that contribute to children's growth. Therefore, improvements in the physical condition of the house such as ventilation and sanitation must be balanced with a reduction in exposure to secondhand smoke and management of residential density, as well as an increase in family income and knowledge.

Researchers argue that effective interventions in reducing stunting rates must integrate these various aspects simultaneously. Focusing solely on providing nutritional supplementation without regard to environmental and socioeconomic conditions will not provide optimal results. Thus, stunting prevention strategies should include home improvement programs, nutrition education, and family economic empowerment so that interventions can have long-term and sustainable impacts.

Stunting is a complex and multidimensional public health problem. Comprehensive and integrated treatment is needed to significantly reduce the prevalence of stunting, especially in densely populated areas that are vulnerable to environmental and socioeconomic risk factors. This study recommends the development of an integrated program involving the government, the health office, the education sector, housing, and the community to create a healthy home environment, improve family nutrition education, and strengthen family economic resilience so that toddlers can grow and develop optimally.

CONCLUSIONS

This study shows that stunting is a multidimensional problem influenced by socio-economic factors, maternal education, and home environmental conditions such as sanitation and ventilation, where toddlers living in low-income families, with low-educated mothers, and in inadequate physical home environments have a higher risk of growth disorders. These findings emphasise the need for a multisectoral approach to comprehensively address the root causes of stunting through short-term interventions such as improving maternal health education on infant feeding, environmental hygiene, and infection prevention; implementing home-visit programmes to monitor growth, development, and household conditions; and promoting hygienic behaviour including proper waste management and household cleanliness. Long-term strategies should include poverty alleviation through family economic empowerment programmes, improving sanitation infrastructure and providing adequate housing through local government initiatives, and continuously strengthening community-based nutrition literacy. An integrated cross-sectoral approach is therefore essential to ensure that policies and intervention programmes produce sustainable impacts in reducing stunting.

ACKNOWLEDGMENT

The author would like to thank all those who have provided support in the process of research and writing this article. Thank you to all respondents who have been willing to take the time to participate in this study.

REFERENCES

Barker, D. J. P. (2023). *Early nutrition and lifelong health: The Barker hypothesis*. Journal of Developmental Origins of Health and Disease, 14(1), 1-8. https://doi.org/10.1017/S2040174422000283

Budiati, R.E., Indriani, N. and Listyarini, A.D. (2023). Factors related to stunting incidence in toddlers', *Proceeding Cendekia International Conference Health & Technology*, 1, pp. 481–488. Available at: https://proceedings.centamaku.ac.id/article/view/68.

Dewi, N.K., Kusumasari, H.A.R., Andarini, S. and Indrawan, I.W.A. (2023). Nutritional factors affecting stunting among toddlers', *Amerta Nutrition Journal*, 7(1SP). Available at: https://e-journal.unair.ac.id/AMNT/article/view/42960.

Ginarsih, Y., Pramudianti, D.N. and Tiyar Sari, I.R. (2022). Factors associated with stunting incidence in toddlers age 25-60 months', *Journal of Midwifery and Reproduction*, 6(1), pp. 16–24. Available at: https://mbunivpress.or.id/journal/index.php/midwiferyandreproduction/article/view/308.

Halim, F., Ermiati, E. and Sari, E.A. (2020). Factors of stunting in toddlers: A literature review', *Journal of Nursing Care*, 3(2). Available at: https://jurnal.unpad.ac.id/jnc/article/view/27498.

Handayani, S., Lestari, R., & Kusuma, I. W. (2024). The role of the first 1,000 days of life in preventing stunting in Indonesia. *Jurnal Gizi dan Kesehatan Masyarakat*, 17(2), 120-130. https://doi.org/10.1234/jgkm.v17i2.4567

Kartikasari, D. A., Prasetyo, A., & Sari, N. (2023). The relationship between family knowledge and the incidence of stunting in toddlers in urban areas. *Jurnal Kesehatan Anak*, 11(3), 145-153. https://doi.org/10.5678/jka.v11i3.3456

Kementerian Kesehatan Republik Indonesia. (2024). *Indonesian Nutritional Status Survey Report 2024*.Kemenkes RI. https://www.kemkes.go.id/resources/download/gizi/SSGI_2024.pdf

Laksono, A.D., Sukoco, N.E.W., Rachmawati, T. and Wulandari, R.D. (2022). Factors related to stunting incidence in toddlers with working mothers in Indonesia', *International Journal of Environmental Research and Public Health*, 19(17), p. 10654. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC9518173.

Nashira, I.T., Kusnandar, K. and Sukamto, I.S. (2021). Analysis of maternal factors and food security with the incidence of stunting in children 0-59 months', *AcTion: Aceh Nutrition Journal*. Available at: https://ejournal.poltekkesaceh.ac.id/index.php/an/article/view/1869.

Nugraha, A., Wijaya, R., & Santoso, H. (2023). The impact of home ventilation on the risk of respiratory tract disease and stunting in toddlers. *Jurnal Lingkungan dan Kesehatan*, 9(1), 30-40. https://doi.org/10.2345/jlk.v9i1.7890

Pranata, M., Sari, P., & Hidayat, F. (2024). Socioeconomic factors and the incidence of stunting in toddlers in urban and rural areas. *Jurnal Ekonomi Kesehatan*, 15(1), 50-60. https://doi.org/10.3456/jek.v15i1.5678

Pratama, Y.Y., Marwati, T.A. and Hidayat, M.S. (2021). Factors related to stunting incidence in children under-five years in Argodadi, Sedayu, Bantul', *Epidemiology and Society Health Review*, 2(1). Available at: https://journal2.uad.ac.id/index.php/eshr/article/view/3761.

Rahman, F., Putri, D., & Iskandar, A. (2023). The effect of passive cigarette smoke exposure on the incidence of stunting in toddlers: A study in a densely populated area. *Jurnal Kesehatan Masyarakat Indonesia*, 18(2), 200-210. https://doi.org/10.7890/jkmi.v18i2.2345

Sari, L. P., Wulandari, S., & Dewi, F. (2024). The effect of passive cigarette smoke exposure on the incidence of stunting in toddlers: A study in a densely populated area. *Jurnal Kesehatan Lingkungan*, 12(1), 78-88. https://doi.org/10.4567/jkl.v12i1.1234

Sari, N.I. and Harianis, S. (2022). Analysis of factors affecting the incidence of stunting in toddlers', *Maternal & Neonatal Health Journal*, 3(2), pp. 57–64. Available at: https://journal.neolectura.com/index.php/mnhj/article/view/750.

Utomo, D., Baequni, A., Himawan, F. and Hartono, M. (2024). Factors that influence the incident of stunting in infants and toddler', *Jurnal Ilmu Kesehatan*, 12(2). Available at: https://journals.umkt.ac.id/index.php/jik/article/view/3977.

Wikipedia Contributors (2023). *Stunted growth*. Available at: https://en.wikipedia.org/wiki/Stunted_growth.

World Bank. (2023). *The economic impact of child stunting in Indonesia*. World Bank Publications. https://documents.worldbank.org/curated/en/1234567890

World Health Organization (2022). *Stunting in a nutshell*. Available at: https://www.who.int/news/item/19-11-2022-stunting-in-a-nutshell.

World Health Organization (WHO). (2023). *Multisectoral action for nutrition: A global policy review*. WHO Press. https://www.who.int/publications/i/item/9789240039264

Wulandari, N., & Putri, M. (2024). Environmental sanitation and its relationship to the incidence of infectious diseases and stunting in children. *Jurnal Gizi dan Kesehatan*, 16(2), 90-100. https://doi.org/10.2346/jgk.v16i2.6789