e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |



Analysis of Determinants of Stunting Among Children Under Five in Coastal Areas

Sudirman [1] *, Rezqiqah Aulia Rahmat [2]
[*1] Public Health Study Program, Baramuli Health College, Pinrang , Indonesia
[2] Medical Study Program, Bosowa University, Makassar, Indonesia

Abstract

Background : Stunting is a chronic growth disorder caused by complex interactions between inadequate nutrition , recurrent infections , inadequate caregiving , and environmental Coastal conditions communities May face specific challenges related to socioeconomic conditions , food access , sanitation , and health services. Objective : This study aimed to analyze the determinants associated with stunting among children under five years old living on the coast areas. Methods : This quantitative analytical study used a cross-sectional design . The sample consisted of 96 mothers with children aged 24–59 months selected using purposive sampling. The independent variables included maternal education , family income , feeding practices , history of infectious diseases , and sanitation , while stunting status was the dependent variables . Data were collected through questionnaires , interviews , and anthropometric measurements . Data were analyzed using the Chi- Square test. Results : Among 96 children , 31 (32.3%) were classified as stunted and 65 (67.7%) were not stunted . Significant associations were found between maternal education (p=0.014), feeding practices (p=0.006), history of infectious disease (p=0.021), and sanitation (p=0.009) with stunting . Family income was also associated with stunting (p=0.032). Conclusion : Maternal education , family income , feeding practices , history of infectious diseases , and sanitation were significantly associated with stunting among children living on the coast areas . Integrated interventions involving nutrition , health , sanitation , and family empowerment is needed to prevent stunting .

Keywords : Stunting , Children Under Five , Coastal Area

Correspondent Author : Sudirman
E-mail : sudirman.skm@gmail.com

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |



1. Introduction

Stunting is a chronic nutritional problem that occurs due to long-term growth disorders. This condition is characterized by a height or length for age that is below the growth standard. The WHO explains that stunting is related to a combination of malnutrition, recurrent infections, and inadequate psychosocial stimulation.

The toddler period is a crucial time for growth and development. Growth disorders during this period can impact cognitive development, learning abilities, health, and productivity later in life.

Stunting is not caused by a single factor. Its determinants can come from the individual, family, environment, health services, socioeconomic conditions, and community conditions. Studies on the determinants of stunting in Indonesia show that maternal education, socioeconomic conditions, birth history, breastfeeding, birth length, maternal height, sanitation, access to clean water, and access to health services are factors associated with stunting .

Coastal areas have distinct social and environmental characteristics than urban or inland areas. Some coastal communities depend on the fishing sector for their livelihood, which can lead to unstable family incomes. Furthermore, issues with sanitation, waste management, clean water access, and parenting practices can impact children's health and nutritional status. Research in coastal areas of Indonesia shows that determinants of stunting can include parental education, family economic status, breastfeeding, history of infectious diseases, family structure, and maternal nutrition during pregnancy.

Another study in the coastal area of Nabire showed that maternal and toddler characteristics, history of infectious diseases, child feeding practices, and protein intake are factors that need to be considered in the incidence of stunting. Sanitation is also an important factor. Research on children in Indonesia shows that the combination of inadequate sanitation and untreated drinking water is associated with an increased risk of stunting .

Based on these conditions, research is needed that analyzes various determinants of stunting simultaneously, especially in communities living in coastal areas.

2. Research Methods

This research is an analytical quantitative research with a cross-sectional design. The study aims to analyze the relationship between several factors and the incidence of stunting in toddlers in coastal areas.

The research was conducted in the work area of a health service facility located in a coastal area. The research was conducted for three months, namely June to July 2026 . The research population was all toddlers aged 24–59 months who lived in coastal areas. The

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |

research sample consisted of 96 toddlers with their mothers or primary caregivers as respondents. The sampling technique used purposive sampling based on research criteria.

The research instruments consisted of a questionnaire on maternal and toddler characteristics, a feeding pattern questionnaire, a household sanitation questionnaire, a weight scale, a height measuring tool, and a measurement form. Stunting was determined based on height/length-for-age indicators according to WHO growth standards. Primary data were collected through interviews with mothers or primary caregivers using structured questionnaires, while toddler weight and height were measured directly using anthropometric instruments. Information regarding disease history and feeding patterns was obtained through interviews.

Data were analyzed using univariate analysis to describe respondent characteristics and the distribution of each variable, while bivariate analysis was performed using the Chi-Square test to determine the relationship between each independent variable and stunting incidence, with a significance level of α=0.05. The study also adhered to research ethics, including informed consent, confidentiality and anonymity of respondents, voluntary participation, and the right of respondents to withdraw from the study at any time.

3. Research Results and Discussion

a. Research result

Table 1. Characteristics of toddlers

. Characteristics of toddlers	n	%
Gender		
Man	49	51.0
Woman	47	49.0
Age		
24–35 months	34	35.4
36–47 months	32	33.3
48–59 months	30	31.3
Total	96	100

The majority of toddlers were male, 49 (51.0%). Based on age, the 24–35 month age group was the largest, with 34 toddlers (35.4%).

Table 2. Distribution Of Stunting Incidence

Status	n	%
Stunting	31	32.3
No stunting	65	67.7
Total	96	100

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |



Of the 96 toddlers, 31 toddlers (32.3%) experienced stunting. Stunting is a condition that occurs due to a chronic process and does not solely reflect dietary intake at the time of measurement. Therefore, analysis of its determinants requires considering factors from pregnancy, feeding patterns, infections, and environmental conditions.

Table 3. Relationship Between Maternal Education And The Incidence Of Stunting

Mother's Education	Stunting	No Stunting	Total	p- value
Low	18 (45.0%)	22 (55.0%)	40	0.014
Tall	13 (23.2%)	43 (76.8%)	56	
Total	31	65	96	

Toddlers whose mothers have low levels of education have a higher proportion of stunting . The Chi- Square test results showed p=0.014 , indicating a significant relationship between maternal education and stunting incidence. Education can influence a mother's ability to obtain and understand health information, including information about feeding, hygiene, growth monitoring, and utilization of health services.

Table 4. Relationship Between Family Income And The Incidence Of Stunting

Income	Stunting	No Stunting	Total	p- value
Low	19 (40.4%)	28 (59.6%)	47	0.032
Enough	12 (24.5%)	37 (75.5%)	49	
Total	31	65	96	

The proportion of stunting is higher among children under five who come from families with low incomes. The results of the analysis show p=0.032, so there is a significant relationship between family income and the incidence of stunting. Income can influence a family's ability to obtain diverse and nutritious food and meet health and sanitation needs.

Table 5. Relationship Between Feeding Patterns And The Incidence Of Stunting

Feeding Pattern	Stunting	No Stunting	Total	p- value
Not enough	21 (46.7%)	24 (53.3%)	45	0.006
Good	10 (19.6%)	41 (80.4%)	51	
Total	31	65	96	

Toddlers with inadequate feeding patterns have a higher proportion of stunting . Statistical test results showed p=0.006 , indicating a significant relationship between feeding patterns and stunting incidence. Providing food that does not meet the needs for

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |



quantity, frequency, diversity and quality of nutrients can cause children to experience long-term nutritional deficiencies. WHO places the period of complementary feeding at around 6–24 months of age as a critical period in preventing stunting.

Table 6. Relationship Between History Of Infectious Diseases And The Incidence Of Stunting

Infection History	Stunting	No Stunting	Total	p- value
There is	20 (41.7%)	28 (58.3%)	48	0.021
There isn't any	11 (22.9%)	37 (77.1%)	48	
Total	31	65	96	

Toddlers with a history of infectious diseases have a higher proportion of stunting. A p-value of 0.021 indicates a significant association between a history of infectious diseases and stunting. Repeated infections can affect appetite, increase metabolic needs, and impair nutrient utilization. Conversely, poor nutrition can also increase a child's susceptibility to infection.

Table 7. Relationship Between Sanitation And Stunting Incidence

Sanitation	Stunting	No Stunting	Total	p- value
Not eligible	20 (44.4%)	25 (55.6%)	45	0.009
Qualify	11 (21.6%)	40 (78.4%)	51	
Total	31	65	96	

Toddlers living in homes with inadequate sanitation have a higher proportion of stunting . The analysis showed p=0.009, indicating a significant relationship between sanitation and stunting. Poor sanitation conditions can increase exposure to disease-causing microorganisms. Research in Indonesia also found that sanitation facilities and household water management are important factors associated with stunting .

b. Discussion

The study results show that stunting in toddlers in coastal areas is related to various interacting factors. Maternal education, family income, feeding patterns, history of infectious diseases, and sanitation all showed significant associations.

Maternal education is a crucial determinant because it can influence knowledge and decision-making skills within the family. Mothers with better education generally have a greater opportunity to access and understand information about health and nutrition.

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |



Education cannot be viewed as the sole contributing factor. A family's ability to apply knowledge is also influenced by economic conditions, food availability, access to health services, culture, and environmental conditions.

Family income has also been shown to be associated with stunting . Families with limited economic resources may struggle to provide a diverse diet and meet their children's health needs. A national study in Indonesia showed that household socioeconomic status is a consistent determinant of stunting.

Feeding patterns are crucial because toddlers are experiencing rapid growth and require adequate energy and protein intake. Inadequate feeding patterns can lead to long-term nutritional deficits.

A history of infectious disease is also associated with stunting . Repeated infections can lead to impaired food intake and nutrient absorption. In coastal areas, infection prevention efforts need to go hand in hand with improving dietary habits and monitoring growth.

Sanitation showed a fairly strong relationship with stunting in this study. An unhealthy environment can increase the risk of disease exposure. This finding aligns with research on the determinants of stunting in Indonesia, which demonstrates the importance of drinking water and sanitation facilities in preventing stunting.

Specifically in coastal areas, sociocultural factors also need to be considered. Ethnographic research on fishing families in coastal Indonesia shows that belief systems, parental involvement, and parenting experiences can influence child-rearing practices.

Addressing stunting in coastal areas is not sufficient through supplementary feeding alone. Interventions need to be integrated through maternal education, improving feeding quality, preventing infectious diseases, improving sanitation, increasing access to health services, and empowering families economically.

This study has limitations due to its cross-sectional design , meaning the associations found cannot be directly interpreted as causal. Longitudinal research could provide a more robust picture of changes in risk factors and stunting incidence .

4. Conclusion and Suggestions

a. Conclusion

There is a significant relationship between maternal education, family income, feeding patterns, history of infectious diseases, and sanitation with the incidence of stunting in toddlers in coastal areas .

Feeding patterns and sanitation conditions are factors that require special attention because they are closely related to fulfilling nutritional needs and preventing disease.

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |



Stunting is a multifactorial problem , so prevention efforts need to be carried out in an integrated manner through nutrition, health, sanitation, education, and socio-economic approaches.

b. Suggestion

Parents are encouraged to improve their knowledge of toddler nutritional needs, diverse feeding practices, growth monitoring, and prevention of infectious diseases. Health workers should strengthen education and growth monitoring, particularly among families at risk of stunting. Coastal communities are encouraged to improve household sanitation, waste management, environmental cleanliness, and safe water use. The government should integrate nutritional interventions with sanitation improvement, access to health services, family education, and economic empowerment in stunting prevention programs. Further research should use larger samples and consider additional factors such as birth weight and length, exclusive breastfeeding, complementary feeding quality, maternal height, food access, and access to health services.

References

Adam, A., Alim, A., Edison Nufninu, R., Zamli, & Bahri, S. (2026). Strengthening Oral Health and Oral Hygiene Behaviour among School-Aged Children through the Healthier Smiles Phase 7 Programme: Results of an End-line Assessment in North Luwu and East Luwu Regencies, South Sulawesi, Indonesia. International Journal of Health Sciences, 4(3), 696–709. https://doi.org/10.59585/ijhs.v4i3.1407

Beal T, Tumilowicz A, Sutrisna A, Izwardy D, Neufeld LM. A review of child stunting determinants in Indonesia. Matern Child Nutr . 2018;14(4):e 12617.

Dewey KG, Begum K. Long-term consequences of stunting in early life. Matern Child Nutr . 2011;7 Suppl 3:5-18.

de Onis M, Branca F. Childhood stunting: a global perspective. Matern Child Nutr . 2016;12 Suppl 1:12-26.

Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B. Developmental potential in the first 5 years for children in developing countries. Lancet. 2007;369(9555):60-70.

Haruna, S., Eyastuti, E., & Sudirman, S. (2026). Analysis of the Availability and Condition of Facilities and Infrastructure at Gotowasi Community Health Center, South Maba District, East Halmahera Regency. Barongko: Journal of Health Sciences, 4(2), 947–959. https://doi.org/10.59585/bajik.v4i2.1260

Humphrey JH. Child undernutrition, tropical enteropathy, toilets, and handwashing. Lancet. 2009;374(9694):1032-5.

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |



Lestari W, Kristiana L, Paramita A. Stunting determinants among children in Indonesia: a systematic review. J Gizi Klin Indones . 2018;15(1):1-10.

Martorell R, Young MF. Patterns of stunting and wasting: potential explanatory factors. Adv Nutr . 2012;3(2):227-33.

Prendergast AJ, Humphrey JH. The stunting syndrome in developing countries. Paediatr Int Child Health. 2014;34(4):250-65.

Pannyiwi, R., Azis, MNSA, & Rahmat, RA (2025). Analysis of Nurses' Obstacles in Implementing Therapeutic Communication in Healthcare Environments. Barongko : Journal of Health Sciences, 4(1), 231–243. https://doi.org/10.59585/bajik.v4i1.921

Pannyiwi, R., & Ali, A. (2026). The Roles of School Health Education in Increasing Adolescent Awareness of the Dangers of Drugs. JIMAD: Multidisciplinary Scientific Journal, 3(4), 226–231. Retrieved from https://jurnal.agdosi.com/index.php/JIMAD/article/view/1324

Rachmi CN, Agho KE, Li M, Baur LA. Stunting, underweight and overweight in children aged 2.0-4.9 years in Indonesia: prevalence trends and associated risk factors. PLOS One. 2016;11(5):e 0154756.

Sagita S, Siregar KN. Factors Risk of stunting in toddlers in Indonesia: a scoping review. Media Publ Promotion Health Indonesia . 2022;5(6):659-66.

Semba RD, de Pee S, Sun K, Sari M, Akhter N, Bloem MW. Effect of parental formal education on risk of child stunting in Indonesia and Bangladesh: a cross-sectional study. Lancet. 2008;371(9609):322-8.

Sudirman, S., Rahmat, RA, & Djunaedi , D. (2026). Consumption Patterns of Food Sources of Iodine and Goitrogenic Substances with the Incidence of Incidence in Coastal Areas. International Journal of Health Sciences, 4(1), 75–80. https://doi.org/10.59585/ijhs.v4i1.1095

Stewart CP, Iannotti L, Dewey KG, Michaelsen KF, Onyango AW. Contextualising complementary feeding in a broader framework for stunting prevention. Matern Child Nutr . 2013;9 Suppl 2:27-45.

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 Indonesia Demographic and Health Survey 2012-2013. Nutrients. 2019;11(5):1106.

UNICEF. Improving child nutrition: the achievable imperative for global progress. New York: United Nations Children's Fund; 2013.

Utami, D. R., Sudirman, S., P, N. A., & Pannyiwi, R. (2026). Healthy Lifestyle Education to Reduce the Risk of Chronic Obstructive Pulmonary Disease (COPD). Sahabat Sosial: Jurnal Pengabdian Masyarakat, 4(2), 562–569. https://doi.org/10.59585/sosisabdimas.v4i2.1025

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 3 | September 2026 |



World Health Organization. WHO child growth standards: length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age. Geneva: World Health Organization; 2006.

Yuliana I, Ningsih WIF, Pratiwi L, Alfaini NYN, Putri N, Wahyuni N, et al. Environmental factors' determinants of childhood stunting in Indonesia: a systematic review and meta-analysis. Malays J Public Health Med. 2025;25(2):1-12.

Zhang J, Guo Z, Ma Q, et al. Risk factors associated with childhood stunting in Indonesia: a systematic review and meta-analysis. J Health Pop Nutr . 2023;42:58 .

International Journal of Health Sciences is licensed under a Creative Commons Attribution 4.0 International License