

# Determinants of Nutritional Status among Toddlers in the Baduy Indigenous Community, Lebak Regency, Banten

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## ABSTRACT

*Nutritional issues among toddlers remain a major public health concern, especially in indigenous communities with limited access to basic services and unique socio-cultural systems, such as the Baduy tribe in Banten, Indonesia. This study aimed to identify key determinants of toddler nutritional status in the Baduy community using a cross-sectional design and multivariate logistic regression analysis. A total of 120 toddlers aged 0–59 months from Baduy Dalam and Baduy Luar were purposively selected. Data were collected through anthropometric measurements and structured interviews covering demographic, economic, environmental, and healthcare access variables. Bivariate analysis (Chi-square) showed significant associations between nutritional status and maternal education, household economic status, environmental sanitation, and healthcare access ( $p < 0.05$ ). Multivariate analysis confirmed these as significant predictors: low maternal education (AOR = 2.31), low economic status (AOR = 4.85), poor sanitation (AOR = 2.70), and limited healthcare access (>3 km) (AOR = 2.40). Child age and gender were not significant factors. The findings indicate that nutritional vulnerability in the Baduy is shaped by structural determinants tied to cultural norms, geographic isolation, and subsistence lifestyles. Effective interventions must be culturally sensitive, improve sanitation and food security, and ensure accessible, community-accepted health services, involving traditional leaders for sustainable impact.*

**Keywords:** Nutritional Status, Toddlers, Indigenous Community, Socio-Economic Determinants



## INTRODUCTION

Childhood malnutrition remains a major public health issue in Indonesia. One of the most common forms of malnutrition is stunting, which has long-term effects on a child's physical and cognitive development. According to national data, the prevalence of stunting has decreased but remains at a level that requires attention. The 2018 Riskesdas survey showed a national stunting prevalence of 30.8%, down from 37.2% in 2013. The 2024 SSGI results recorded a further decrease to 19.8%, approaching the WHO threshold of 20% and showing progress compared to 2023 (21.5%) (Ministry of Health, 2020; Yanti & Yunus, 2024).

Stunting reflects chronic, prolonged nutritional imbalance, influenced by social, economic, biological, and environmental factors. Determinants such as maternal education, maternal nutritional status during pregnancy, birth weight, and access to healthcare services strongly influence the nutritional status of infants (Jokhu et al., 2024). Disparities are also evident between urban and rural communities; children in rural areas are at higher risk due to limited access to nutritious food, clean water, and healthcare services (Siramaneerat et al., 2024). Multivariate studies in Indonesia confirm low birth weight, child age, and maternal nutritional status as consistent predictors of malnutrition (Permatasari & Chadirin, 2022).

At the district level, Lebak (Banten Province) shows a relatively high burden. The 2021–2022 SSGI, cited by local governments and international institutions, shows a stunting prevalence in Lebak District of approximately 27.3% (2021), decreasing to 26.2% (2022)—among the highest in Banten Province and above the provincial average ( $\pm 20\%$ ) (Nabilah et al., 2024). Data by name and address from the Lebak Health Office in December 2023 also reported 3,788 infants ( $\approx 3.65\%$ ) identified as stunted in operational monitoring, illustrating the burden of cases that must be addressed in primary care services despite differences in survey methodology. At a more micro level, the Cimarga Health Centre's working area is among the top five based on the 2021 EPPGBM (14.42% with 302 cases), marking a risk pocket that requires integrated intervention (Nabilah et al., 2024).

The Baduy indigenous community resides in Kanekes Village, Leuwidamar Subdistrict, Lebak Regency, and possesses unique socio-cultural and geographical characteristics. Recent findings from a community service programme (2024; published 2025) report a stunting prevalence of 27.30% in Baduy (Kanekes Village), with early marriage (at 19 years of age) reaching 50.38%; these factors are associated with child nutrition risks and reproductive health (Ritanti et al., 2025). Several qualitative studies also highlight challenges in health interventions in Baduy—misperceptions that stunting is a 'genetic factor,' health literacy gaps, cross-cultural communication barriers, and logistical constraints—which often hinder the optimisation of nutrition programmes (Ayu et al., 2024; Putri et al., 2025). On the consumption side, studies on the dietary quality of Baduy Luar infants show a dominance of breast milk but low intake of animal protein, reflecting limitations in food diversity (Paramashanti et al., 2021; Vidyarini & Muzakir, 2023).

Unique socio-cultural barriers in Baduy include strict traditional norms (restrictions on technology, preference for food self-sufficiency, resistance to modern medical practices), early

marriage patterns, and very limited access to media/information—all of which have the potential to reduce dietary diversity and utilisation of maternal and child health services (Nurritzka et al., 2020; Paramashanti et al., 2021; Ritanti et al., 2025). Geographical barriers include hilly terrain and scattered settlements, limited road access, and distances to health centres/hospitals that require walking or travelling by simple vehicles over difficult terrain; this reduces the frequency of ANC/KIA, immunisation coverage, and nutritional follow-up (Ritanti et al., 2025). Health access barriers include service availability that is not always aligned with local culture, cold chain logistics and supplementation, and programme sustainability (Putri et al., 2025). In isolated rural communities, additional determinants such as sanitation, birth spacing, and exclusive breastfeeding practices have also been found to be strong predictors of malnutrition (Sulistyaningsih et al., 2024).

Given the lack of studies that specifically highlight the nutritional status of toddlers in indigenous communities such as Baduy using a multivariate statistical approach (Widyaningsih et al., 2022), this research is important. A multivariate logistic regression approach is expected to identify dominant factors—demographic, health behaviour, and environmental that interact with one another, thereby generating nutrition intervention recommendations that are culturally and locally appropriate. Such contextual strategies are more effective in reducing malnutrition than generic interventions that are less sensitive to local socio-cultural dynamics (Permatasari et al., 2022; Ayu et al., 2024).

Research Objective: to identify the determinants of the nutritional status of Baduy tribe toddlers through multivariate logistic regression analysis to obtain a comprehensive picture of the challenges and opportunities for improving child nutrition in indigenous communities in Indonesia.

## METHODS

This study is a quantitative cross-sectional study that aims to identify the determinants that influence the nutritional status of toddlers in the Baduy indigenous community. The study population includes all toddlers aged 0–59 months living in the Baduy Dalam and Baduy Luar areas, Lebak Regency, Banten Province.

Sample selection was conducted using purposive sampling based on inclusion criteria, namely infants who permanently reside in the Baduy indigenous area and have obtained written consent (informed consent) from their parents or guardians. Data collection was conducted through anthropometric measurements using calibrated digital scales and portable stadiometers, as well as the completion of structured questionnaires covering the demographic characteristics of children and parents, including age, gender, mother's education, father's occupation, parity, economic status, sanitation conditions, dietary patterns, history of infectious diseases, and access to health services. Nutritional status was determined based on the WHO Child Growth Standards using z-scores for weight-for-age (WFA), height-for-age (HFA), and weight-for-height (WFH), with categories of normal nutrition ( $z\text{-score} \geq -2\text{ SD}$ ), underweight ( $WFA < -2\text{ SD}$  to  $\geq -3\text{ SD}$ ), and severe malnutrition ( $BW/H < -3\text{ SD}$ ).



Data analysis was performed using the latest version of SPSS software with a univariate approach for frequency description, bivariate using the chi-square test, and multivariate using logistic regression to identify significant factors, with a significance value of  $p < 0.05$  and reporting of the Adjusted Odds Ratio (AOR) along with the 95% Confidence Interval (CI). Data validity was ensured through training of local enumerators who understood the language and culture of the Baduy tribe, as well as instrument testing prior to data collection.

This study obtained ethical approval from the Health Research Ethics Committee of the Faculty of Public Health with number 123/KEPK-FKM/XI/2024. The limitations of this study include the measurement of maternal education, which is based solely on the highest level of formal education without considering non-formal education or nutritional literacy; the categorisation of fathers' occupations, which is general without exploring variations in income or seasonal fluctuations in work; economic status assessment based on income and asset ownership, which may not fully reflect real well-being in a subsistence agricultural system; and measurement of health service access using physical distance ( $>3$  km or  $\leq 3$  km) as an indicator, although in the context of indigenous communities like the Baduy tribe, accessibility is also influenced by terrain conditions, transportation availability, and cultural norms. The selection of this method is considered appropriate because it is able to explain the simultaneous relationship between social, environmental, and biological factors on the nutritional status of toddlers, while also considering the complexity of nutritional determinants in the context of indigenous communities.

## RESULTS

Prior to the bivariate and multivariate analyses, a descriptive analysis was conducted on the characteristics of the Baduy infants, including age, gender, nutritional status, maternal education, paternal occupation, economic status, sanitation status, and access to health services. The following table presents the frequency distribution of the main variables in the study:

**Table 1. Distribution of Characteristics of Respondents of Baduy Tribe Toddlers (n = 120)**

Variables	Category	Frequency (n)	Percentage (%)
Child's Age (months)	0–11	25	20.8%
	12–35	50	41.7%
	36–59	45	37.5%
Gender	Man	65	54.2%
	Woman	55	45.8%
Nutritional status	Normal nutrition	62	51.7%
	Malnutrition	34	28.3%
	Severe malnutrition	24	20.0%
Mother's Education	No school	48	40.0%
	Elementary school/equivalent	60	50.0%
	Junior high school and above	12	10.0%
Father's occupation	Farmer	88	73.3%
	Informal traders/workers	25	20.8%

	Doesn't work	7	5.9%
<b>Economic Status</b>	Low	78	65.0%
	Middle to upper class	42	35.0%
<b>Environmental Sanitation</b>	Worthy	45	37.5%
	Not feasible	75	62.5%
<b>Access to Health Services</b>	Easy ( $\leq 3$ km)	28	23.3%
	Difficult ( $> 3$ km)	92	76.7%

The results of the descriptive analysis show that the largest proportion of toddlers are in the 12–35 month age group (41.7%), which according to the literature is a vulnerable period for nutritional deficiencies due to increased energy and nutrient requirements for rapid growth (UNICEF, 2021). The gender distribution is relatively balanced, with a slight predominance of boys (54.2%), consistent with findings from child nutrition studies in rural communities, which indicate that gender distribution generally aligns with population proportions (Jokhu et al., 2024).

Based on nutritional status, more than half of the children (51.7%) are in the normal nutritional category, but there is still a substantial proportion experiencing malnutrition (28.3%) and severe malnutrition (20.0%). This stunting rate approaches the public health problem threshold according to the WHO ( $\geq 20\%$ ), thus still requiring intervention.

Characteristics of mothers of young children show that most have only completed primary education (SD) or are uneducated (40.0%). Low maternal education has been identified as a strong determinant of child nutrition issues, as it influences knowledge, attitudes, and feeding practices. Most fathers work as farmers (73.3%), and over half of families (65.0%) belong to the low-income group, a condition that limits the family's ability to provide nutritious food sustainably.

From an environmental perspective, the majority of households have inadequate sanitation conditions (62.5%), consistent with evidence that poor sanitation increases the risk of gastrointestinal infections, which can worsen children's nutritional status (Sulistyaningsih et al., 2024). Additionally, most infants (76.7%) were reported to have limited access to healthcare facilities, due to factors such as distance, terrain, or socio-cultural barriers, similar to the conditions faced by isolated indigenous communities in Indonesia.

Overall, the percentage distribution of these variables indicates the potential influence of structural factors—including education, economic conditions, and the environment—on the nutritional status of toddlers in the Baduy indigenous community. Further analysis using bivariate and multivariate approaches is needed to identify the most dominant factors at play.

### Bivariate Analysis: Chi-Square Test

Bivariate analysis was performed to determine the relationship between independent variables and the nutritional status of toddlers (in this case categorised as normal nutrition vs malnutrition).



**Table 2. Relationship between Respondent Characteristics and Toddler Nutritional Status (n = 120)**

Variables	Category	Normal Nutritional Status (n)	Malnutrition Status (n)	p-value
Child Age	0–11 months	16	9	0.310
	12–35 months	24	26	
	36–59 months	22	23	
Gender	Man	30	35	0.211
	Woman	32	23	
Mother's Education	No school	22	26	0.032
	Elementary school/equivalent	33	27	
	Junior high school and above	7	5	
Father's occupation	Farmer	43	45	0.415
	Informal traders/workers	14	11	
	Doesn't work	5	2	
Economic Status	Low	25	53	0.001
	Middle to upper class	37	5	
Environmental Sanitation	Worthy	30	15	0.002
	Not feasible	32	43	
Access to Health Services	Easy ( $\leq 3$ km)	20	8	0.021
	Difficult ( $> 3$ km)	42	50	

Based on the results of bivariate analysis using the Chi-Square test, it was found that several variables showed a statistically significant relationship to the nutritional status of toddlers in the Baduy community. Maternal education showed a significant relationship ( $p = 0.032$ ), where children of mothers who did not attend school had a higher proportion of malnutrition than children of mothers with higher education. Family economic status was also significantly related to nutritional status ( $p = 0.001$ ); children from families with low economic status were more likely to experience malnutrition than those from middle to upper economic families. In addition, environmental sanitation conditions also had a significant relationship ( $p = 0.002$ ); toddlers living in environments with inadequate sanitation had a higher proportion of malnutrition. Similarly, access to health services showed a significant relationship ( $p = 0.021$ ), where children living far from health facilities were more likely to experience malnutrition. Meanwhile, other variables such as child's age, gender, and father's occupation did not show a significant relationship ( $p > 0.05$ ), although they were still considered in further analysis because some had  $p$  values  $< 0.25$ .



**Table 3. Multivariate Logistic Regression Results of Factors Influencing Toddler Nutritional Status**

Variables	Reference Category	AOR	95% CI	p-value
Mother's Education	Junior high school and above	2.31	1.09 – 4.91	0.029
Economic Status	Middle to upper class	4.85	1.97 – 11.94	0.001
Environmental Sanitation	Worthy	2.70	1.30 – 5.61	0.007
Access to Health Services	Easy ( $\leq 3$ km)	2.40	1.10 – 5.22	0.028
Gender	Woman	1.42	0.69 – 2.92	0.340
Child Age	0–11 months	0.95	0.41 – 2.21	0.902

The results of the multivariate logistic regression analysis (Table 3) show that there are four variables that significantly influence the nutritional status of toddlers in the Baduy indigenous community, namely maternal education, family economic status, environmental sanitation conditions, and access to health services, after controlling for other variables such as child age and gender.

First, maternal education has an Adjusted Odds Ratio (AOR) of 2.31 (95% CI: 1.09–4.91;  $p = 0.029$ ). This value indicates that infants whose mothers have low education (no schooling or only primary school completion) have a 2.31 times higher risk of experiencing malnutrition compared to children of mothers with secondary school education or higher. Theoretically, maternal education influences knowledge, attitudes, and practices related to nutrition, such as food selection, age-appropriate feeding, and utilisation of health services. In the context of the Baduy tribe, low maternal education is not only due to limited access to schools but also cultural norms that restrict women's participation in formal education, thereby severely limiting access to nutrition information.

Second, family economic status is the strongest predictor in this model with an AOR of 4.85 (95% CI: 1.97–11.94;  $p = 0.001$ ). This means that infants from families with low economic status are nearly five times more likely to experience malnutrition than children from middle-class and above families. This condition is in line with the concept of household food security, where limited income restricts the family's ability to purchase or produce nutritious food on a sustainable basis. In the Baduy community, the majority of families live from subsistence farming with harvests that vary depending on the season, so the availability of animal protein and fresh vegetables is often limited.

Third, environmental sanitation conditions were also found to be significant, with an AOR of 2.70 (95% CI: 1.30–5.61;  $p = 0.007$ ). This means that toddlers living in households with inadequate sanitation have a 2.7 times higher risk of malnutrition than those living in environments with adequate sanitation. Poor sanitation increases the risk of exposure to pathogens that cause diarrhoea, intestinal parasite infections, and skin diseases, which can interfere with nutrient absorption and trigger chronic malnutrition. In the Baduy community, poor sanitation is influenced by geographical factors, limited clean water infrastructure, and hygiene practices that still rely on open water sources.



Fourth, access to health services has an AOR of 2.40 (95% CI: 1.10–5.22;  $p = 0.028$ ). Infants living more than 3 km from health facilities are 2.4 times more likely to experience malnutrition than those living closer to such facilities. Distance here is not only measured physically but also represents terrain barriers, transportation availability, and socio-cultural factors. In the Baduy context, difficult physical access is often exacerbated by reluctance to utilise modern healthcare services due to reliance on traditional medicine and concerns about external intervention.

Meanwhile, the variables of gender (AOR = 1.42;  $p = 0.340$ ) and child age (AOR = 0.95;  $p = 0.902$ ) did not show significant effects in the final model. This suggests that the risk of malnutrition in this community is more influenced by structural factors (education, economy, sanitation, and health access) than biological factors such as age or gender.

These findings underscore that improving the nutritional status of infants in indigenous communities like the Baduy tribe requires interventions focused on enhancing maternal education, strengthening household food security, improving environmental sanitation, and providing accessible and culturally appropriate healthcare services. This approach is consistent with UNICEF's health determinants model and the WHO's conceptual framework, which place socio-economic and environmental factors as the primary determinants of children's nutritional status.

## DISCUSSION

### 1. Relationship between Respondent Characteristics and Toddler Nutritional Status

The results of the bivariate analysis indicate that there are several variables that have a significant relationship with the nutritional status of toddlers in the Baduy community, namely maternal education, economic status, environmental sanitation, and access to health services. Maternal education has been proven to have an influence, where toddlers whose mothers did not attend school have a higher risk of experiencing nutritional problems compared to children of mothers with higher education. This aligns with Bronfenbrenner's theory, which emphasises the importance of the microenvironment, such as the family, in shaping children's behaviour and health conditions. Economic status also shows a meaningful association; children from low-income families are more likely to experience malnutrition, indicating that economic constraints severely limit families' ability to provide nutritious food and access to adequate healthcare.

Furthermore, environmental sanitation conditions are another significant factor. Infants living in environments with inadequate sanitation are at greater risk of malnutrition. Unhygienic environmental conditions increase the risk of recurrent infections, which ultimately affect nutrient absorption and child growth. Similarly, limited access to healthcare services further exacerbates infants' nutritional status due to delays in detecting and addressing nutritional issues. These findings are consistent with a study by Clark et al., 2023, which shows that maternal education, economic status, sanitation, and access to healthcare are important factors in preventing stunting and malnutrition in toddlers in remote areas and indigenous communities (Clark et al., 2023). Researchers assume that in the context of closed communities like the Baduy tribe, limited access to information and public facilities further amplifies the influence of these variables on children's nutritional status. In addition, a study by Bertacchi et al., 2021 emphasises that distance and



limited access to health services hinder the utilisation of posyandu and routine toddler nutrition checks (Bertacchi et al., 2021).

In the context of Baduy society, low levels of maternal education are not only caused by limited formal educational facilities, but are also influenced by traditional norms that restrict women from pursuing higher education or receiving information from outside the community. This limits mothers' ability to understand their children's nutritional needs, manage appropriate diets, and make health decisions. The family's economic status, which largely depends on subsistence farming, makes food availability highly dependent on the harvest season, making it difficult to meet nutritional needs throughout the year. Unsatisfactory sanitation conditions are influenced by limited clean water infrastructure, minimal waste disposal facilities, and traditional hygiene practices. Barriers to health access, in addition to being influenced by distance (>3 km) and difficult terrain, are exacerbated by a preference for traditional medicine and resistance to modern medical services.

Meanwhile, the variables of child age and gender did not show a significant influence in the multivariate analysis. Theoretically, age differences can affect nutritional needs and infection risks, and gender is sometimes associated with different parenting or feeding patterns in some cultures. However, in the Baduy community, parenting and feeding patterns are relatively uniform across all age groups and genders of infants, thus not resulting in statistically significant differences. This suggests that structural and environmental factors are more dominant in influencing nutritional status than biological factors.

The limitations of this study should also be noted. Mother's education level was measured based solely on formal education without directly assessing nutritional literacy. Father's occupation was categorised broadly without considering actual income variations or seasonal work fluctuations. Economic status was assessed using income and asset ownership indicators, which in the context of subsistence indigenous communities may not fully represent real well-being. Access to health services was measured based on physical distance, which is indeed a major barrier in this region, but does not fully capture non-physical barriers such as transport availability, topographical conditions, and community trust in health facilities.

Based on these findings, researchers assume that improving the nutritional status of toddlers in indigenous communities such as the Baduy tribe requires a holistic approach that integrates interventions at various levels. Improving mothers' nutritional literacy, strengthening food security based on local resources, developing sanitation infrastructure that is appropriate to the local culture, and providing accessible health services that are sensitive to indigenous values are key strategies. By understanding the complex interactions between structural determinants, environmental factors, and cultural values, the findings of this study have strong practical relevance for the formulation of contextual and sustainable public health policies in remote indigenous areas.



## **2. Multivariate Logistic Regression Results of Factors Influencing the Nutritional Status of Toddlers**

The results of multivariate logistic regression strengthen the bivariate findings and show that there are four variables that significantly influence the nutritional status of toddlers after being controlled for with other variables, namely maternal education, economic status, environmental sanitation conditions, and access to health services. Maternal education has an adjusted odds ratio (AOR) of 2.31, indicating that children from mothers with low education have a greater likelihood of experiencing malnutrition. Low maternal education levels are assumed to correlate with low understanding of nutrition and proper feeding practices. Economic status is the most dominant factor, with an AOR of 4.85, indicating that toddlers from poor families are almost five times more likely to experience malnutrition than those from families with better economic conditions.

The third significant factor is environmental sanitation. Toddlers living in environments with inadequate sanitation are 2.7 times more likely to experience malnutrition. Unhygienic environments contribute to high rates of diarrhea and other infections, which impact nutritional status. Meanwhile, difficult access to health facilities (distances greater than three kilometers) increases the risk of malnutrition by 2.4 times. This demonstrates the importance of easily accessible basic health services in the prevention and early management of nutritional problems. The findings of this study align with several recent studies that emphasize the importance of maternal education, household economic status, environmental sanitation, and access to health care as key predictors of child nutritional status, particularly in remote or indigenous communities. A study by Majoge and Luta (2021) found that toddlers born to mothers with low education, living in poor households, and lacking access to clean water and proper sanitation are at higher risk of stunting and multiple malnutrition (Majoge & Luta, 2021).

Other research in Latin America and the Caribbean shows that households with low maternal education and low economic status, especially in rural areas, have a high prevalence of stunted toddlers and overweight mothers, indicating a double burden of malnutrition stemming from the same social determinants (Otten & Seferidi, 2022).

Meanwhile, a study in Ethiopia showed that the lack of clean water, the absence of family latrines, and low maternal education were significant factors that increased the risk of stunting and wasting in children under five in drought-prone areas (Kabalo & Lindtjørn, 2022). Similar results were found by Iqbal et al. (2024), who concluded that parental education, access to clean water, and affordability of health facilities were significant determinants of the nutritional status of children under five in densely populated, less developed areas (Iqbal et al., 2024).

Researchers assumed that the four variables proven significant in the multivariate analysis maternal education, economic status, environmental sanitation, and access to health services are part of a system of structural determinants that are mutually integrated and deeply rooted in the socio-cultural conditions of the Baduy community. For example, low maternal education not only means limited access to nutritional information but is also related to cultural norms that discourage women's involvement in activities outside the home and communication with external

parties such as health workers. This has implications for the minimal use of nutritional information from the media or counseling, as well as low maternal empowerment in household decision-making related to children's health.

The economic conditions of families in the Baduy community are not only understood as financial constraints, but also related to limited economic mobility due to geographic isolation and traditional lifestyle choices. Researchers assume that toddlers from low-income families have limited access to nutritious food, including animal protein or fresh vegetables that may not be readily available in their immediate environment. Poor environmental sanitation is assumed to be caused not only by inadequate infrastructure but also by a lack of hygiene awareness that has not yet become part of local cultural knowledge.

Furthermore, access to healthcare in the Baduy community is limited not only by physical distance but also by the community's reliance on traditional medicine and suspicion of external intervention. The researchers hypothesize that these four factors are not mutually exclusive, but rather complement each other in creating nutritional vulnerability in toddlers. Therefore, they believe that interventions to improve nutritional status must address the community's social structure and cultural values, and involve traditional leaders in the education and behavior change process.

## CONCLUSIONS

This study shows that the nutritional status of toddlers in the Baduy indigenous community is significantly influenced by structural factors, particularly maternal education, family economic status, environmental sanitation conditions, and access to health services. Multivariate analysis confirms that these four factors are major predictors of malnutrition, with low economic status being the strongest determinant. Mothers with low education levels are more likely to engage in inappropriate feeding practices; economic constraints limit the availability and diversity of nutritious foods; inadequate sanitation increases the risk of infections that hinder nutrient absorption; and limited access to healthcare reduces the likelihood of early detection and management of nutritional issues.

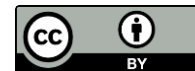
Meanwhile, the variables of child age and gender were not found to be significant, indicating that nutritional vulnerability in this community is more influenced by socio-economic and environmental factors than biological factors. The socio-cultural characteristics of the Baduy, such as limited interaction with the outside world, traditional norms that restrict formal education, and a preference for traditional medicine, reinforce the influence of these structural determinants.

These findings underscore the need for contextually designed and culturally appropriate nutrition interventions that involve traditional leaders, strengthen maternal nutrition literacy, develop household food security, improve sanitation infrastructure, and expand culturally sensitive health services. A comprehensive and collaborative cross-sectoral approach is key to addressing nutrition issues in remote indigenous communities such as the Baduy tribe.



## REFERENCES

- Ayu, M. S., Rahmadhani, M., Pangestuti, D., & Ibarra, F. (2024). Identifying Risk Factors For Stunting Among Under-Five Indonesian Children. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi | JIITUJ |*, 8(2), 794–803. <https://doi.org/10.22437/jiituj.v8i2.34450>
- Bertacchi, S., Pagliari, S., Cantù, C., Bruni, I., Labra, M., & Branduardi, P. (2021). Enzymatic Hydrolysate of Cinnamon Waste Material as Feedstock for the Microbial Production of Carotenoids. *International Journal of Environmental Research and Public Health*, 18(3), 1146. <https://doi.org/10.3390/ijerph18031146>
- Clark, K. D., Flentje, A., Sevelius, J. M., Dawson-Rose, C., & Weiss, S. J. (2023). Stressors in health care and their association to symptoms experienced by gender diverse people. *Public Health*, 217, 81–88. <https://doi.org/10.1016/j.puhe.2023.01.017>
- Iqbal, A., Ahmad, B., Sadaf, T., Bashir, T., Yousaf, A., & Liaqat, M. (2024). Prevalence And Determinants Of Malnutrition Among Under- Five Children Of Household In Slum Areas Of District Faisalabad. *Agricultural Sciences Journal*, 1, 46–58. <https://doi.org/10.56520/asj.24.310>
- Jokhu, L. A., Syauqy, A., Lin, L.-Y., Dieny, F. F., & Rahadiyanti, A. (2024). Determinants of stunting among children 6–23 months: a population-based study in Indonesia. *Nutrition & Food Science*, 54(8), 1369–1382. <https://doi.org/10.1108/nfs-01-2024-0025>
- Kabalo, B. Y., & Lindtjørn, B. (2022). Seasonality and predictors of childhood stunting and wasting in drought-prone areas in Ethiopia: a cohort study. *BMJ Open*, 12(11), e060692. <https://doi.org/10.1136/bmjopen-2021-060692>
- Kemenkes . (2020). *National Strategy to Accelerate the Prevention of Stunting in Children*. Stranas Stunting. <https://stunting.go.id/stranas-p2k/>
- Majoge, P. O., & Luta, V. M. (2021). *Prevalence And Drivers Of Individuallevel Double Burden Of Malnutrition Among Under5 Children In Kenya*. -. <https://consensus.app/papers/prevalenceanddriversofindividualleveldoubleburdenmajogeluta/c98c1d70c16a56f19b4c3efe45bdca5c/>
- Nabilah, K., Muhdar, I. N., Lestari, W. A., & Sariman, S. (2024). The Relationship Between Macro-Nutrient Intake, Food Security, and Nutrition-Related Knowledge with The Incidence of Stunting in Toddlers. *Journal of Health and Nutrition Research*, 3(2), 164–171. <https://doi.org/10.56303/jhnresearch.v3i2.268>
- Nurrizka, R. H., Dwi Mutia Wenny, & Agustina. (2020). Comparison Study About Determinants Of Children Under Five Years Malnutrition Between Indigenous And Non-Indigenous Communities In Indonesia. *Malaysian Journal of Public Health Medicine*, 20(1), 22–29. <https://doi.org/10.37268/mjphm/vol.20/no.1/art.455>
- Otten, H. S., & Seferidi, P. (2022). Prevalence and socioeconomic determinants of the double burden of malnutrition in mother–child pairs in Latin America and the Caribbean. *BMJ Nutrition, Prevention & Health*, 5(2), 263–270. <https://doi.org/10.1136/bmjnp-2022-000489>
- Paramashanti, B. A., Huda, T. M., Alam, A., & Dibley, M. J. (2021). Trends and determinants of minimum dietary diversity among children aged 6–23 months: a pooled analysis of



- Indonesia Demographic and Health Surveys from 2007 to 2017. *Public Health Nutrition*, 1–12. <https://doi.org/10.1017/s1368980021004559>
- Permatasari, T. A. E., & Chadirin, Y. (2022). Assessment of Undernutrition Using Composite Index of Anthropometric Failure (CIAF) and its Determinants: A Cross-Sectional Study in the Rural Area of Bogor District in Indonesia. *Research Square (Research Square)*. <https://doi.org/10.21203/rs.3.rs-1182149/v1>
- Permatasari, T. A. E., Chairunnisa, C., Djarir, H., Herlina, L., Fauziah, M., Asmuni, A., & Chadirin, Y. (2022). The Determinant of Stunting and Others Malnutrition Among Under Five Years: A Cross-Sectional Study in Urban Areas in Indonesia. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4166949>
- Putri, L. D., Agustin, H., Bakti, I., & Suminar, J. R. (2025). Genetic Perception Versus Nutritional Factors: Analyzing the Indigenous Baduy Community's Understanding of Stunting as a Health Issue. *International Journal of Environmental Research and Public Health*, 22(2), 145. <https://doi.org/10.3390/ijerph22020145>
- Ritanti, Siregar, T., Permatasari, I., & Utari, D. (2025). Empowering Healthy Beranting Families (Eradicating Early Marriage and Stunting) in the Baduy Tribe. *Gemakes: Journal of Community Service*, 5(1). <https://doi.org/10.36082/gemakes.v5i1.2109>
- Siramaneerat, I., Astutik, E., Agushybana, F., Bhumkittipich, P., & Lamprom, W. (2024). Examining determinants of stunting in Urban and Rural Indonesian: a multilevel analysis using the population-based Indonesian family life survey (IFLS). *BMC Public Health*, 24(1). <https://doi.org/10.1186/s12889-024-18824-z>
- Sulistyaningsih, E., Wulandari, E. S. P., & Marchianti, A. C. N. (2024). Determinant factors of under-five years severely wasted children in rural and sub-urban areas of Indonesia. *Journal of Education and Health Promotion*, 13(1). [https://doi.org/10.4103/jehp.jehp\\_108\\_24](https://doi.org/10.4103/jehp.jehp_108_24)
- Vidyarini, A., & Muzakir, H. (2023). Diet Quality Index of Infants Aged 6–9 Months of the Baduy Luar Ethnic Group in Lebak Regency, Indonesia. *Jurnal Gizi Dan Pangan*, 18(Supp.1), 27–29. <https://doi.org/10.25182/jgp.2023.18.suppl.1.27-29>
- Widyaningsih, V., Mulyaningsih, T., Nur, R. F., & Adhitya, D. (2022). Determinants of socioeconomic and ruralurban disparities in stunting: evidence from Indonesia. *Rural and Remote Health*, 22 1, 7082-. <https://doi.org/10.22605/RRH7082>
- Yanti, E. S., & Yunus, E. M. (2024). Low Birth Weight and Inappropriate Feeding Variation Caused Nutritional Disorders Based on The Composite Index of Anthropometric Failure (CIAF). *Media Gizi Indonesia*, 19(3), 311–321. <https://doi.org/10.20473/mgi.v19i3.311-321>