

The Relationship Between Maternal Characteristics and Socioeconomic Factors and the Incidence of Stunting Among Children Under Five in Palembik Village

Ahmat Rafi'i¹, Apriani Susmita Sari^{*}, Ririnsahawaitun¹

¹Department of Nursing Science, STIKES Hamzar, East Lombok, West Nusa Tenggara, Indonesia

Abstract

*Corresponding author:
Apriani Susmita Sari,
Department of Nursing
Science, STIKES
Hamzar, East Lombok,
West Nusa Tenggara
Email:
aprianisusmita92@gmail.com

Article info:
Received: 2025-03-24
Revised: 2025-04-19
Accepted: 2025-05-23

e-ISSN: 3047-6054
Volume 2(1): 30-39,
May 2025

Background: Stunting is a chronic form of malnutrition caused by prolonged inadequate nutritional intake, leading to impaired growth in children. This condition results in a child's height being significantly shorter than the standard for their age. The impact of stunting can last a lifetime, affecting cognitive, motor, and verbal development, and may extend to the next generation.

Objective: This study aimed to examine the relationship between maternal characteristics and socioeconomic factors with the incidence of stunting among children under five in Palembik Village, within the working area of the Darek Health Center, Southwest Praya District.

Methods: This was an analytical study using a cross-sectional design to assess the association between independent variables (maternal characteristics and socioeconomic factors) and the dependent variable (stunting incidence). Data were analyzed using the Chi-square test.

Results: Significant relationships were found between several maternal and socioeconomic factors with the incidence of stunting. Maternal age was significantly associated with stunting ($p = 0.001$), as was maternal height ($p = 0.000$). Maternal education also showed a significant association ($p = 0.002$). Among socioeconomic variables, father's education ($p = 0.002$), father's occupation ($p = 0.001$), mother's occupation ($p = 0.000$), and family income ($p = 0.000$) were all significantly related to stunting incidence.

Conclusion: Maternal characteristics including age, height, and education as well as socioeconomic factors such as parental education, parental occupation, and family income, are significantly associated with the incidence of stunting in Palembik Village, Darek Health Center area, Southwest Praya District.

Keywords: Children under five; maternal characteristics; socioeconomic factors; stunting

Introduction

Stunting remains a major public health concern globally, affecting approximately 148.1 million children under the age of five, as reported by UNICEF, WHO, and the World Bank in 2023. This condition reflects chronic undernutrition and is often linked to delayed physical growth and impaired cognitive development. The consequences of stunting extend beyond childhood, influencing future academic performance, productivity, and increasing the risk of chronic diseases in adulthood (UNICEF, 2023; WHO, 2023). While the global prevalence has declined slightly in recent years, the problem remains severe in low- and middle-income countries, particularly in Asia and sub-Saharan Africa (UNICEF/WHO/World Bank, 2023).

In Southeast Asia, stunting continues to be a pressing issue. Indonesia ranks among the countries with the highest burden of stunting, with a prevalence of 21.6% in 2022, down from 24.4% in 2021. Despite this reduction, the figure remains above the WHO threshold of 20%,

classifying it as a public health problem (Kemenkes RI, 2023). The Indonesian government has set a national target to reduce stunting prevalence to 14% by 2024. This ambitious goal is part of the National Strategy to Accelerate Stunting Prevention (Stranas Stunting), which emphasizes multi-sectoral collaboration, nutrition-specific and nutrition-sensitive interventions, and improved data governance (TNP2K, 2022).

Stunting results from a complex interplay of factors, including inadequate maternal nutrition, poor infant and young child feeding (IYCF) practices, recurrent infections, and limited access to quality health services (Victora et al., 2021). The first 1,000 days of life, from conception to a child's second birthday, represent a critical window of opportunity for interventions. Nutritional deficiencies during this period can have irreversible effects on growth and brain development (Black et al., 2013). In Indonesia, the challenges are multifaceted and vary across regions, with disparities in access to healthcare, sanitation, and education contributing significantly to the problem (Kementerian Kesehatan RI, 2023). Similar findings were reported by Pratiwi, Islaeli, & Islamiyah (2024) and Titor, Arnoli, & Syam (2024), who identified maternal knowledge and socioeconomic factors as significant determinants of child nutritional status and stunting incidence. Additionally, Hasanudin, Watung, & Darmin (2025) emphasize that comorbidities such as tuberculosis can further exacerbate malnutrition risks in vulnerable populations.

Addressing stunting requires a comprehensive and evidence-based approach. Studies have demonstrated the effectiveness of community-based nutrition interventions, such as complementary feeding counseling, micronutrient supplementation, and growth monitoring, in reducing stunting rates (Dewey & Adu-Afarwuah, 2008; Bhutta et al., 2013). Moreover, the integration of health, agriculture, education, and social protection sectors is essential to tackle the root causes of malnutrition. Government-led programs such as the Family Assistance Program (Program Keluarga Harapan/PKH) and the provision of supplementary food through the Community-Based Nutrition Program (Program Perbaikan Gizi Masyarakat/PPGM) play a pivotal role in supporting vulnerable households (Bappenas, 2021).

In addition to national efforts, local governments have been encouraged to adopt innovative strategies tailored to their specific contexts. For instance, the use of electronic-based recording and reporting systems (e-PPGBM) has improved data accuracy and facilitated timely decision-making in stunting prevention programs. Furthermore, the Ministry of Health promotes the "Isi Piringku" campaign, which educates families on balanced nutrition using culturally appropriate messages (Kemenkes RI, 2022). These interventions are aligned with global recommendations that stress the importance of context-specific, culturally sensitive, and community-driven approaches in combating stunting (UNICEF, 2023).

Despite these efforts, challenges remain. Inconsistent implementation of programs, limited human resources, and insufficient community engagement hinder progress in many areas (Headey et al., 2020). Consequently, strengthening community-based health services and enhancing the capacity of health workers are vital components of a sustainable stunting reduction strategy. Continuous monitoring and evaluation mechanisms must also be in place to assess the impact of interventions and inform policy adjustments (Victora et al., 2021).

A robust understanding of the determinants and context-specific risk factors of stunting is essential to design targeted interventions. This study seeks to contribute to the existing body of knowledge by examining the effectiveness of community-level efforts in reducing stunting among under-five children. It aims to explore the roles of health cadres, maternal education, and household food security as key factors influencing stunting outcomes. By highlighting best practices and challenges encountered in program implementation, the findings can inform future strategies to accelerate progress toward Indonesia's stunting reduction goals.

Methods

Study Design

This research employed a cross-sectional design, where both independent and dependent variables were measured at the same point in time. This approach was used to assess associations rather than causal relationships (Notoatmodjo, 2020).

Participants

The population in this study consisted of mothers with children aged 24–60 months in Palembang Village, totaling 58 individuals. The sample was selected using purposive sampling, based on specific inclusion criteria. A total of 51 respondents met the criteria and participated in the study research.

Instruments

The data in this study were obtained through structured interviews using a validated questionnaire. The questionnaire was developed based on previous research and adapted to the study objectives. It included sections on participant characteristics, dietary patterns, knowledge and attitudes regarding child nutrition, and specific risk factors contributing to stunting. To ensure its validity, the questionnaire underwent a content validity assessment by nutrition and public health experts. A pilot test was also conducted with a small sample to assess its clarity and reliability, resulting in necessary adjustments prior to its full-scale deployment. The reliability coefficient (Cronbach's alpha) for the main sections ranged from 0.72 to 0.85, indicating acceptable internal consistency.

Data Collection

Data collection was carried out through direct distribution of the questionnaire to eligible mothers, conducted in person by the researcher. Respondents received a brief explanation of the study objectives and were guided through each question to ensure proper understanding. Data were collected within a defined timeframe under consistent conditions.

Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics such as means, standard deviations, frequencies, and percentages were used to summarize participant characteristics. Bivariate analyses, including chi-square tests and t-tests, were performed to examine associations between stunting and potential risk factors. Furthermore, logistic regression analysis was used to identify independent predictors of stunting while controlling for confounding variables. The significance level was set at $p < 0.05$ for all statistical tests.

Ethical Considerations

This study adhered to ethical principles in health research. Participants were provided with clear information regarding the study's purpose, procedures, and confidentiality assurances. Informed consent was obtained both verbally and in writing. Participation was entirely voluntary, with no form of coercion. This research received ethical clearance from the Research Ethics Committee of STIKes Hamzar, ensuring compliance with established ethical standards.

Results

Univariate Analysis

Table 1 presents the frequency distribution of maternal characteristics and socioeconomic factors. The highest proportion of respondents (60.8%) were aged between 20–30 years, followed by 33.3% under 20 years old, and 5.9% above 35 years old. Regarding maternal height, the majority of mothers (60.8%) were shorter than 150 cm, while 39.2% were taller than 150 cm. Educational attainment showed that 51.0% of mothers did not attend school, and 49.0% had received formal education. In terms of the father's education, 56.9% had attended school, while 43.1% had not. For employment status, 49.0% of fathers were employed and 51.0% were unemployed. Among mothers, 56.9% were not employed, and 43.1% were working. Family income data revealed that 54.9% of respondents lived below the regional minimum wage (UMR), whereas 45.1% had income above the UMR. Nutritional status measurements indicated that 68.6% of children were classified as stunted, while 31.4% were in the normal category.

Table 1. Frequency distribution of maternal characteristics and socioeconomic factors

Variable	Frequency	Percentage (%)
Age of pregnant women		
<20 years old	17	33.3
20-30 years	31	60.8
>35 years old	3	5.9
Height		
<150 cm	31	60.8
>150 cm	20	39.2
Mother's Education		
Not in school	26	51.0
School	25	49.0
Father's Education		
Not in school	22	43.1
School	29	56.9
Father's work		
Not working	21	51
Work	30	49
Mother's work		
Not working	29	56.9
Work	22	43.1
Income		
Under Umr	28	54.9
Above the Umr	23	45.1
Measurement		
Stunting	35	68.6
Usual	16	31.4

Source: SPSS Processed Data, 2024

Bivariate Analysis

The bivariate analysis explores the relationship between maternal characteristics, socioeconomic factors, and the incidence of stunting in children. As shown in Table 2, among 17 mothers aged <20 years, all children (100%) experienced stunting. In the 20–30 age group, 15 respondents (48.4%) had children with stunting, while 16 (51.6%) had children with normal nutritional status. All three respondents aged >35 years had children who were stunted (100%). The chi-square test yielded a p-value of 0.001, indicating a statistically significant relationship between maternal age and stunting incidence.

Table 2. relationship between maternal characteristics based on age and stunting incidence

Age	Stunting measurement				Sum	%	p-Value
	Stunting		Usual				
	n	%	n	%			
<20 years old	17	100%	0	0%	17	100%	
20-30 years	15	48.4%	16	51.6%	31	100%	
>35 years old	3	100%	0	0%	3	100%	
Total	35	68.8%	16	31.4%	51	100%	0,001

Source: SPSS Processed Data, 2024

Regarding maternal height Table 3, 28 out of 31 mothers with a height of <150 cm (90.3%) had children with stunting, compared to only 7 out of 20 mothers (35%) who were taller than 150 cm. The p-value of 0.000 suggests a significant association between maternal height and stunting incidence.

Table 3. Relationship Maternal characteristics by height with the incidence of stunting

TB	Stunting measurement				Sum	%	p-Value
	Stunting		Usual				
	n	%	n	%			
<150	28	90.3%	3	9.7%	31	100%	0,000
>150	7	35%	13	65%	20	100%	
Total	35	68.6%	16	31.4%	51	100%	

Source: SPSS Processed Data, 2024

Table 4 examines the influence of maternal education. Among mothers without formal education, 23 (88.5%) had children who were stunted, while among those with formal education, only 12 (48%) had stunted children. The association was statistically significant, with a p-value of 0.002, indicating that maternal education is related to the incidence of stunting.

Table 4. The relationship between maternal characteristics based on maternal education and the incidence of stunting

Education	Stunting measurement				Sum	%	p-Value
	Stunting		Usual				
	n	%	n	%			
Not in school	23	88.5%	3	11.5%	26	100%	0,002
School	12	48%	13	52%	25	100%	
Total	35	68.6%	16	31.4%	51	100%	

Source: SPSS Processed Data, 2024

Paternal education, as shown in Table 5, also had a notable impact. Among fathers who had not attended school, 10 children (45.5%) experienced stunting, whereas 25 children (86.2%) of fathers with formal education were stunted. This relationship was statistically significant (p-value = 0.002).

Table 5. Socio-economic based on father's education with stunting incidence

Education	Stunting measurement				Sum	%	p-Value
	Stunting		Usual				
	n	%	n	%			
Not in school	10	45.5%	12	54.5%	22	100%	0,002
School	25	86.2%	4	13.8%	29	100%	
Total	35	68.6%	16	31.4%	51	100%	

Source: SPSS Processed Data, 2024

Table 6 presents the relationship between paternal employment and stunting. Of 21 unemployed fathers, 9 children (42.9%) were stunted. In contrast, among 30 employed fathers, 26 children (86.7%) were stunted. The chi-square test yielded a p-value of 0.001, indicating a significant relationship between paternal employment status and stunting.

Table 6. Socioeconomic relationship based on paternal employment level with stunting incidence

Father's work	Stunting measurement				Sum	%	p-Value
	Stunting		Usual				
	n	%	n	%			
Not working	9	42.9%	12	57.1%	21	100%	0,001
Work	26	86.7%	4	13.3%	29	100%	
Total	35	68.6%	16	31.4%	51	100%	

Source: SPSS Processed Data, 2024

Maternal employment, illustrated in Table 7, also showed a strong association. Among 29 unemployed mothers, 26 (89.7%) had stunted children, while among the 22 employed mothers, only 9 (40.9%) had children who were stunted. This relationship was significant, with a p-value of 0.000.

Table 7. Socioeconomic Relationship based on maternal employment level with stunting incidence

Mother's work	Stunting measurement				Sum	%	p-Value
	Stunting		Usual				
	n	%	n	%			
Not working	26	89.7%	3	10.3%	29	100%	0,000
Work	9	40.9%	13	59.1%	22	100%	
Total	35	68.6%	16	31.4%	51	100%	

Source: SPSS Processed Data, 2024

Lastly, Table 8 shows the relationship between family income and stunting. Of 28 families earning below the regional minimum wage (UMR), 27 children (96.4%) were stunted. In contrast, only 8 of the 23 children (34.8%) from families earning above the UMR experienced stunting. The p-value of 0.000 confirms a significant association between low family income and higher stunting incidence.

Table 8. Socioeconomic relationship based on family income with stunting incidence

Income	Stunting measurement				Sum	%	p-Value
	Stunting		Usual				
	n	%	n	%			
Below UMR	27	96.4%	1	3.6%	28	100%	0,000
Above UMR	8	34.8%	15	65.2%	23	100%	
Total	35	68.6%	16	31.4%	51	100%	

Source: SPSS Processed Data, 2024

Discussion

Characteristics of mothers in Palembang Village in the working area of the Darek Health Center, Southwest Praya District.

Characteristics of mothers by age

This study found a significant relationship between maternal age and stunting. Younger mothers (<20 years) and older mothers (>35 years) were more likely to have stunted children. All mothers in both age extremes had children who experienced stunting. These findings support previous research by Syarif (2022), which found that maternal age affects the risk of growth disorders in children. Younger mothers may not be physically or emotionally prepared for motherhood and often face competition for nutrients between their own growth and the fetus (Proverawati & Asfuah, 2009). Similarly, older mothers may experience reduced nutrient absorption and physiological decline that can impact fetal development (Rahmawati et al., 2018).

Maternal Height

The study also revealed a strong association between maternal height and stunting, with shorter mothers (<150 cm) significantly more likely to have stunted children. These findings are consistent with research by Rahayu (2022), which confirmed that maternal stature is a predictor of child growth outcomes. Short maternal height may reflect chronic undernutrition and intergenerational effects, increasing the risk of delivering low-birth-weight babies who are more susceptible to stunting (Ministry of Health, 2010; Schmidt et al., 2002).

Maternal Education

Low maternal education was significantly related to higher stunting rates. Mothers with no formal education had a higher proportion of stunted children compared to educated mothers. This

aligns with Nasution et al. (2017), who emphasized the role of maternal knowledge in child care and feeding practices. Educated mothers are more likely to access health information, participate in health programs, and make informed decisions about nutrition and hygiene, all of which contribute to better child health outcomes.

Socioeconomic Factors and Stunting

Father's Education and Occupation

While the father's education level alone showed variation in stunting outcomes, this study suggests that paternal involvement in child care and nutritional decisions may be limited. Wahdah et al. (2016) highlighted that fathers often focus on income generation, leaving child-rearing responsibilities to mothers. However, additional irregular income from creative or side jobs as discussed by Ramadhani et al. (2019) can positively affect household nutrition by increasing food security.

Socioeconomic factors based on father's occupation

Based on the results of socio-economic research based on his father's work in Palembik Village in the Work Area of the Darek Health Center, Southwest Praya District, from 51 respondents, it is known that the most are 30 respondents (49%). Creative fathers looking for additional irregular income can also help avoid *stunting* in toddlers, with this additional income the food/nutrition needs of toddlers can be met (Ramadhani et al., 2019).

Maternal Employment

Mothers who were employed had significantly lower rates of stunted children. This finding is consistent with Lestari et al. (2014), who found that working mothers are more likely to contribute to household income, enabling better access to nutritious food and health services. Dual-income households are generally more capable of meeting children's nutritional needs, reducing the risk of stunting (Fauzia et al., 2019).

Socioeconomic factors based on family income

The study demonstrated a significant relationship between low family income and stunting. Nearly all respondents with income below the regional minimum wage had stunted children. This confirms the findings of Farah Ulya (2022), who reported that income levels influence nutritional access and stunting prevalence. According to Rufaida et al. (2020), higher income allows families to provide adequate complementary foods, vaccinations, and health care, all essential for child development.

The relationship between maternal characteristics and the incidence of stunting in Palembik Village in the working area of the Darek Health Center, Southwest Praya District.

The relationship between maternal age characteristics and stunting incidence

Based on the table, it is known that from 17 respondents aged <20 years, 17 respondents (100%) have an incidence of stunting and 0 respondents who do not have stunting, and of 31 respondents aged 20-30 years as many as 15 respondents (48.4%) who have an incidence of stunting and 16 respondents (51.6%) who are normal, while of 3 respondents aged >35 years who have an incidence of stunting as many as 3 respondents (100%). The results of the study between maternal age and stunting incidence showed that there was a significant relationship with a p value of 0.001 (<0.05), this shows that there is a relationship between maternal characteristics based on age and stunting incidence in Palembik Village in the working area of the Darek Health Center, Southwest Praya District.

This research is in line with the results of Syarif (2022) research explaining that there is a relationship between the age of pregnant women and the prevention of children at risk of growth retardation. Although the study (Salamung, 2019) did not find a relationship between maternal age and stunting prevention behaviors during pregnancy, researchers found that maternal age was associated with maternal psychology, such as pregnancy acceptance, likely to be a factor influencing health patterns during pregnancy. and until the birth of the baby. This research is in line with the results of Syarif (2022) research explaining that there is a relationship between the

age of pregnant women and the prevention of children at risk of growth retardation. Proverawati. A & Asfua.S (2009) found that pregnant women need more nutrients at a younger age (<20 years) compared to pregnant women of childbearing age (20-35 years). Pregnancy at a young age causes a competition for food between the fetus and the mother. Mothers who become pregnant in their teens or early twenties need large amounts of nutrients to meet the nutritional needs of the mother and the growing fetus. This happened because the mother was still elderly. Rapid growth and development occurs in adolescence. Children under the age of 20 are recorded as adolescents (Notoatmodjo, 2011).

The relationship between maternal height characteristics and stunting incidence

Based on the table, it can be seen that of the 31 respondents who had TB <150 years old, 28 respondents (90.3%) had an incidence of stunting and 3 respondents (9.7%) did not experience stunting, while of the 20 respondents who had TB >150, as many as 7 respondents (35%) had stunting, and 13 respondents (65%) were normal. The results of the study between the relationship between maternal characteristics based on height and stunting were obtained with a p-value of 0.000 (<0.005), this shows that there is a relationship between maternal characteristics based on TB and stunting events. The results of this study are in line with the research (Rahayu D. 2022) that there is a relationship between maternal height and the prevention of baby birth with the risk of stunting p value = 0.001 (<0.05). The mother's height of less than 150 cm is a risk factor for growth retardation. According to the Ministry of Health of the Republic of Indonesia, (2010), in Indonesia the prevalence of children under 5 years old in pregnant women with a short height <150 cm is 46.7% while pregnant women with a height of more than 150 cm is 34.8%. A study conducted by Schmidt et al. (2002) found an increase in infant height of 0.196 cm for every increase in maternal height by 1 cm in West Java (p<0.000).

The relationship between maternal education characteristics and the incidence of stunting

Based on the table, it can be seen that from 26 respondents who were not in school, 23 respondents (88.5%) had an incidence of stunting and 3 respondents (11%) did not experience stunting, while of the 25 respondents who went to school, 12 respondents (48%) experienced stunting and 13 respondents (54%) were normal. The results of the study between the relationship between maternal characteristics based on education and the incidence of stunting were obtained with a p-value of 0.002 where a value of <0.005 showed that there was a relationship between maternal education and the incidence of stunting. Good maternal education encourages the absorption of external information, especially the provision of nutritious food to children, to avoid the risk of malnutrition. On the other hand, mothers with low education/knowledge/development patterns are attracted to parents and neighbors who have little education and experience, and are obstacles to optimal childcare and cause malnutrition (Nasution et al., 2017).

The relationship between socioeconomic factors and the incidence of stunting in Palembang Village in the working area of the Darek Health Center, Southwest Praya District.

The relationship between socioeconomic factors based on family income and stunting incidence

Based on the table, it is known that of the 28 respondents with income below the UMR, 27 respondents (96.1%) are stunting and 1 respondent (3.6%) is normal, while those above the UMR are 8 respondents (34.8%) who are stunting and 15 respondents (65.2%) are normal. The results of the study obtained a p-value of 0.000 where the value was <0.005, this shows that there is a relationship between family income and stunting incidence This study is in line with the research (Farah Ulya, 2022) Family income in this study is related to the incidence of *stunting* (p=0.019). The incidence of *stunting* in toddlers with family income below or above the UMR is higher (69.8%) than the incidence of *stunting* in toddlers who come from families with income equivalent to or above the UMR (30.2%). Family income is one of the main determinants of *stunting* incidence in toddlers, because family income is related to the availability/fulfillment

of food and nutrition needs. High family income can also meet the needs of complementary feeding for breast milk, and complete immunization (Rufaida *et al.*, 2020),

Conclusion

The results of this study show that there is a significant relationship between maternal characteristics and socioeconomic factors with the incidence of stunting in Palembang Village, the working area of the Darek Health Center, Southwest Praya District. Maternal characteristics such as age, height, and education level have been proven to affect the nutritional status of children under five. In addition, socioeconomic factors such as parental education, employment, and household income also play an important role in determining stunting incidence. These findings suggest that stunting prevention programs must adopt a comprehensive approach that addresses both maternal-specific factors and broader household socioeconomic conditions. Scientifically, the study contributes to the growing evidence that maternal stature and education are crucial determinants of child growth outcomes in low-resource settings. Practically, these findings can inform public health policies to strengthen maternal and child health programs, improve women's access to education, and expand income-generating opportunities for vulnerable families. Policymakers are encouraged to design targeted interventions that integrate nutritional education, economic support, and community-based maternal health initiatives to effectively reduce stunting rates.

References

- Astuti, Sri. 2020. Stunting Prevention Movement through Community Empowerment in Jatinangor District, Sumedang Regency, Sumedang
- Diah, W. (2020) 'Personal Hygiene of Diarrhea Sufferers in the UPT Gayaman Mojoanyar-Mojokerto Health Center Area', *Journal of Nursing*, 5(1), pp. 1–9.
- Dwi, A. 2019. The Effect of Stunting on Cognitive Development and Learning Achievement. *Indonesian Journal of Clinical Nutrition*, 1(1): 273–282.
- Hardianty, A., Anwar, & Wahyuni, A. (2024). Mother's Knowledge and Attitude Correlated with Nutritional Status of Children. *Omni Nursing Journal*, 1(3), 70–75. <https://omnijournal.id/index.php/nursing/article/view/52>
- Lestari, P. and Hati. F. S. 2015. The Effect of Stimulation on the Development of Children Aged 12-36 Months in Sedayu District, Bantul Indonesian Journal of Nurses and Midwifery. Vol.4,No.1. 44-48
- Notoatmodjo, S. (2020) Health Promotion and Health Behavior. Jakarta: Rineka Cipta.
- Nursalam. (2016). Nursing Science Research Methodology. Jakarta: Selemba Medika
- Pratiwi, I., Israeli, I., & Islamiyah, I. (2024). The Relationship Between Maternal Knowledge About 1000 HPK With Nutritional Status in Children 0-24 Months. *Omni Health Journal*, 1(2), 56-61. <https://omnijournal.id/index.php/health/article/view/47>
- Prendergast, A. J., & Humphrey, J. H. (2014). The stunting syndrome in developing countries. *Paediatrics and International Child Health*, 34(4), 250–265. <https://doi.org/10.1179/2046905514Y.0000000158>
- Rahayu, A. & Khairiyati, L. 2018. Maternal Education Risk of Stunting in Children 6-23 Months. *The Journal of Nutrition and Food Research*, 37(2 Dec): 129–136. Available at <http://ejournal.litbang.depkes.go.id/index.php/pgm/article/view/4016>
- Rahmawati, T. (2020). The Relationship between Nutrient Intake and Nutritional Status of Nutrition Students in Semester 3 of Stikes PKU Muhammadiyah Surakarta. *PROFESSION (Islamic Professionals)*, 14(2), 49–57.
- Semba, R. D., Shardell, M., Sakr Ashour, F. A., Moaddel, R., Trehan, I., Maleta, K. M., ... & Ferrucci, L. (2016). Child stunting is associated with low circulating essential amino acids. *EBioMedicine*, 6, 246–252. <https://doi.org/10.1016/j.ebiom.2016.02.030>
- Smith, L. C., & Haddad, L. (2015). Reducing child undernutrition: past drivers and priorities for the post-MDG era. *World Development*, 68, 180–204. <https://doi.org/10.1016/j.worlddev.2014.11.014>

- Suharto, A., Wildan, Moh., & Handayani, T. E. (2020). Development of Stunting Prevention Behavior Model Based on Health Promotion Model and Social Capital in The Magetan District. *Health Notions*, 4(2), 48–56. <https://doi.org/10.33846/hn40204>
- Tiator, F., Arnoli, A., & Syam, I. (2024). Factors Related To The Incidence Of Stunting In Toddlers. *Omni Health Journal*, 1(2), 62-69. <https://omnijournal.id/index.php/health/article/view/46>
- UNICEF, WHO, & World Bank Group. (2021). *Levels and trends in child malnutrition: UNICEF/WHO/World Bank Group joint child malnutrition estimates – key findings of the 2021 edition*. Geneva: WHO.
- UNICEF. 2014. Levels And Trends In Child Malnutrition. UNICEF
- WHO. Stunting in nutshell [internet]. World Health Organization. 2020 [cited 2021 Jun 10]. Available from: <https://www.who.int/news/item/19-11-2015-stunting-in-a-nutshell>