



THE RELATIONSHIP BETWEEN HOUSEHOLD FOOD SECURITY AND STUNTING INCIDENCE IN TODDLERS

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ABSTRACT

Stunting among children under five years old (toddler) is a fundamental challenge that must be addressed. This is due to the nutritional status of children in the first five years of life is related to cognitive development and the prevention of chronic diseases later in life. Given the high prevalence of stunting across various regions, it is necessary to conduct research to identify factors associated with stunting. Food security is one of the factors contributing to stunting based on the WHO framework. This study aimed to examine the relationship between household food security and the incidence of stunting. This study used a cohort design with retrospective approach. The retrospective method used in this approach involves first measuring stunting in children under five years old, then tracing back their household food security history to determine whether there are factors influencing the incidence of stunting. The sampling technique used was purposive sampling, and the sample size was determined using the Slovin formula, resulting in a total of 123 mothers with stunted toddlers. Chi-square analysis was used for data analysis. The chi-square test showed a p-value of 0.010. This study found a significant relationship between household food security and the incidence of stunting.

Keywords: household food security; stunting; toddlers

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INTRODUCTION

Chronic malnutrition or stunting in childhood is a fundamental challenge that must be addressed (Sartika et al., 2021). This is because a child's nutritional status in the first five years of life is associated with cognitive development and the prevention of chronic diseases later in life (Budhathoki et al., 2020). The issue of stunting remains a concern in many low- and middle-income countries (Mulyaningsih et al., 2021). According to the World Health Organisation, (2022), the number of stunting cases globally was around 148.1 million, accounting for 22.3% of toddlers in 2022. The highest prevalence of stunting in toddlers occurred in Africa (31.0%), Southeast Asia (30.1%), and East Asia in the Mediterranean region (25.1%). The global food and nutrition crisis triggered by conflict, climate change, and the long-term effects of the COVID-19 pandemic has resulted in a persistently high prevalence of stunting in several countries.

Indonesia is one of the developing countries with high rates of malnutrition, including stunting (Mulyaningsih et al., 2021). According to the 2022 Indonesian Nutritional Status Survey, the prevalence of stunting cases in 2022 decreased by 2.8%, while the prevalence in 2021 was 24.4%, dropping to 21.6% in 2022. Furthermore, in West Sumatra, the prevalence of stunting increased to 25.2% in 2022 from 23.3% in 2021. The WHO framework identifies four factors contributing to stunting: household and family factors, inadequate complementary feeding, poor breastfeeding practices, and infections. Food security is one of the factors

within households and families (Kiik & Nuwa, 2020). Food security refers to a condition in which individuals have physical, social and economic access to sufficient food to meet their dietary needs (Berra, 2020). Prolonged poor food security can limit a household's ability to access and afford a variety of foods, leading to the consumption of smaller quantities of food, which affects the nutritional intake of children under five years old (Nsubuga et al., 2022). This is what makes food security one of the main determinants of chronic malnutrition in young children (Burman et al., 2022).

Research by Anastasia et al., (2023), found a relationship between household food security and the incidence of stunting with a p-value 0,021, identifying it as a major factor in stunting among toddlers. Similarly a study by Gassara et al., (2023), found a relationship between household food security and stunting in toddlers, with a p-value of 0,000. The study also found that households with severe food insecurity were 2,356 times more likely to have stunted toddlers than food-secure households. Household food access is a determining factor that indicates the food needs of a household, both in terms of quality and quantity. Food access is considered adequate when it is physically, economically, and socially sustainable. Meanwhile, food insecurity occurs when household experience concerns about their access to available (Sanson-Rosas et al., 2021). Food-insecure households are an indicator that food allocation, particularly for toddlers, cannot meet both quantity and quality requirements (Sihite, 2022). Food insecurity has the potential to cause various health problems across all age groups, but it has particularly detrimental effects on children under five years old (Bilbeisi et al., 2022). Inadequate food intake, both in terms of quantity and quality, can harm a child's body and brain during critical growth periods. Limited access to food often results in children receiving less diverse diets. A lack of dietary diversity makes children more vulnerable to opportunistic infections and severe diseases (Gizaw et al., 2022).

Household food security is considered one of the main factors influencing the incidence of stunting (Sotoudeh et al., 2021). Unaddressed stunting incidence can lead to various short-term and long-term problems. Short-term effects of stunting include illness, impaired development (cognitive, motor, language), and death (Kiik & Nuwa, 2020). According to Nepali et al., (2019), impaired linear growth in early childhood can affect health. Additionally, stunting hinders toddlers from reaching their age cognitive potential (Ezeh et al., 2021). In the long term, stunting results in short stature in adulthood, poorer health, reduced academic performance, impaired learning capacity, and diminished work productivity (Kiik & Nuwa, 2020). Impaired growth and development can impact long-term productivity and influence future economic prospects (Beckmann et al., 2021; Nepali et al., 2019). This becomes one of the indicators hindering overall national development. To achieve sustainable development goals in reducing malnutrition cases and decreasing the number of stunted children, research and policies must address subpopulations experiencing disproportionate increases in stunting (Nepali et al., 2019).

Policies and programs designed to accelerate the reduction of stunting rates typically focus on addressing the underlying risk factors and causes of stunting in a given region (Vaivada et al., 2020). For example, in Rwanda, strategies to combat food insecurity include providing assistance to children from impoverished populations (Binagwaho et al., 2020). In Indonesia, there are both specific and sensitive intervention programs aimed at reducing stunting. Food security interventions are classified under sensitive programs, which include providing cash assistance to low-income families to improve access to basic health services (such as immunization and iron supplementation) and nutrition (Sekretariat Wakil Presiden RI, 2021). However, some programs have not fully achieved their goals due to inadequate cross-sectoral

coordination in addressing stunting. Based on these issues, this research seeks to analyze the relationship between household food security and stunting. The findings from this factor can be used to develop sustainable stunting mitigation strategies (Gebreyohanes & Dessie, 2022).

METHOD

The research design used in this study is a cohort study with a retrospective approach. The study initially measured the dependent variable, then retrospectively traced the independent variable to determine the presence or absence of a factor. This research was conducted in three community health centers with the highest stunting prevalence in Padang City: Seberang Padang Health Center, Andalas Health Center, and Ikur Koto Health Center. The sample used in this study consisted of 123 mothers of stunted toddlers. The sample size was determined using the Slovin formula, with purposive sampling as the chosen sampling technique. The inclusion criteria were mothers with stunted children aged 12-59 months in 2024, mothers who had health service books (KIA), and mothers willing to participate as respondents and abled to communicate well. The exclusion criteria were mothers with stunted toddlers who had congenital abnormalities. In this study, the Household Food Insecurity Access Scale (HFIAS) questionnaire was used to measure food security, which had been tested for validity and reliability by Ashari et al., (2019). The calculated correlation coefficient (r) ranged from 0.393 to 0.682, and the Cronbach's alpha was 0.84, indicating that the questionnaire was valid and reliable. The data analysis used in this study was the chi-square test because the data were categorical. This study also received ethical approval, with approval number 351/layak etik/KEPKFKEPUNAND.

RESULT

Table 1.
Respondent characteristics (n = 123)

General Characteristics	f	%
Mother's Age		
20-29 Years	34	27,6
30-39 Years	60	48,8
40-49 Years	29	23,6
Toddler's Age		
12-23 Months	26	21,1
24-35 Months	37	30,1
36-47 Months	33	26,8
48-59 Months	27	22,0
Toddler's Gender		
Male	53	43,1
Female	70	56,9
Mother's Employment Status		
Not Employed	108	87,8
Employed	15	12,2

Table 1 shows the characteristics of the respondents. The age range of the mothers was primarily 30-39 years old (48.8%), while the average age of the toddlers ranged from 24-35 months. The majority of toddlers were female (56.9%), and most of the mothers (87.8%) were unemployed.

Table 2.
Dependent Variable Characteristics (n = 123)

Dependent Variable	f	%
Short	80	65
Severely Short	43	35

Table 2 shows the distribution of the dependent variable, which is stunting incidence. Of the 123 stunted toddlers, 65% were classified as short-stunted, while 35% were classified as severely short-stunted.

Table 3.

Independent Variable	f	%
Household Food Security		
Food Secure	33	26,8
Mildly Food Insecure	45	36,6
Moderately Food Insecure	24	19,5
Severely Food Insecure	21	17,1

Table 3 shows the distribution of the independent variable, household food security. Of the 123 stunted toddlers, 36.6% lived in mildly food-insecure households, 26.8% in food-secure households, 19.5% in moderately food-insecure households, and 17.1% in severely food-insecure households.

Table 4.

Household Food Security	Stunting Incidence				Total	P
	Short		Severely Short			
	f	%	f	%		
Food Secure	27	81,8	6	18,2	33	0,010
Mildly Food Insecure	28	62,2	17	37,8	45	
Moderately Food Insecure	17	70,8	7	29,2	24	
Severely Food Insecure	8	38,1	13	61,9	21	

Table 4 shows the results of the chi-square test, demonstrating the relationship between household food security and stunting incidence. Among the 45 mildly food-insecure households, 62.2% of toddlers were short-stunted, and 37.8% were severely short-stunted. Among the 33 food-secure households, 81.8% of toddlers were short-stunted, and 18.2% were severely short-stunted. In moderately food-insecure households, 70.8% of toddlers were short-stunted, and 29.2% were severely short-stunted. In severely food-insecure households, 38.1% of toddlers were short-stunted, and 61.9% were severely short-stunted. The chi-square test yielded a p-value of 0.010, indicating a significant relationship between household food security and stunting incidence.

DISCUSSION

In this study, the percentage of households with mild food insecurity was found to be 36.6%. Similar findings were reported by Afework et al., (2021), where 32.4% of stunted toddlers were from households with mild food insecurity. Meanwhile, in the study by Asna et al., (2022), 33.3% of stunted children were found in households experiencing severe food insecurity. Furthermore, based on the chi-square results from this study, a significant relationship was found between household food security and the incidence of stunting (p = 0.010). Similar findings were reported by Donkor et al., (2022), who found a p-value of 0.001, indicating a significant relationship between food security and stunting. However, Namirembe et al., (2022) reported different findings, with a p-value of 0.183, indicating no significant relationship between food security and stunting.

At different levels of food insecurity, various experiences are involved. In cases of mild food insecurity, individuals often feel worried about food availability. However, in moderate and severe levels, food reduction may occur, leading to missed meals or even going without food for several days (Argaw et al., 2023). According to the study by Gholampour et al., (2020), children from food-insecure households are at risk of experiencing growth disorders. There

are four pillars of food security: access to food (or the ability to purchase food), food availability, stability of food supply through economic factors, and the utilization of food in terms of quality and diversity (Nagappa et al., 2020). However, these pillars can be influenced by socioeconomic and cultural factors in the region where people live (Sanson-Rosas et al., 2021). The food security status measured in this study is largely based on household access to food, which will affect the level of food diversity (Argaw et al., 2023). Food insecurity in households affects the variety and nutritional value of the food consumed by families (Kamaruzaman et al., 2024). The variety of food consumed by families, such as low intake of fruits, grains, vegetables, fish, chicken, meat, eggs, and fats (Najib et al., 2023). Children from food-insecure households are less likely to receive adequate nutrition over the long term (Toma et al., 2023).

Household access to food is essential for meeting dietary needs concerning both quality and quantity. Insufficient access to food within households can hinder families from fulfilling the nutritional needs of toddlers (Najib et al., 2023). Food security can influence children's nutritional status both directly and indirectly through various mechanisms (Hasan et al., 2023). In pregnant women, this can lead to fetus's nutritional problems and affecting its growth (Dhingra & Pingali, 2021). During pregnancy, a substantial amount of hormone production is required for the mother, fetus, and placenta. The most important hormones secreted include glucocorticoids, leptin, and insulin-like growth factors. The secretion of these hormones can be affected by maternal malnutrition, which in turn influences fetal growth and development (Gonete et al., 2021). Intrauterine malnutrition hinders development, leading to decreased energy needs and alterations in endocrine system regulation. These changes are necessary for early life but, in the long term, result in impaired growth (Abdillah, 2022).

Poor household socioeconomic factors and inadequate food security lead caregivers to neglect the provision of complementary feeding (Hailu et al., 2020). Additionally, food-insecure households tend to provide diets high in starch but low in protein, with increased consumption of snacks and reduced intake of fruits and vegetables (Masitoh et al., 2023). This indicates that these households are unable to afford animal-based food sources due to high food prices (Belayneh et al., 2020). Furthermore, according to Marume et al., (2023), a significant association was found between the lack of animal-sourced complementary foods in the past seven days and growth impairment. The quality and quantity of protein-rich foods can influence plasma levels of insulin-like growth factors, growth factor mediators, bone matrix proteins, and growth factors, which are essential for bone formation (Mahfouz et al., 2022). In addition, a lack of protein and micronutrients can weaken a child's immunocompetence, making them more susceptible to infectious diseases (Chakraborty et al., 2024). According to Bilbeisi et al., (2022), approximately 77.6% of food-insecure households exhibit negative attitudes toward nutrition. With limited resources, families tend to cut costs by opting for more affordable foods. In the study by Quamme & Iversen, (2022), it was found that household with good food security are twice as likely to provide a diverse diet for their children compared to food insecure households.

Children living in households with food insecurity may experience stunted growth. Furthermore, food insecurity can induce anxiety and depressive symptoms in mothers, which can directly affect child growth. Indirectly, this may influence the caregiving patterns exhibited, leading to undesirable behaviors in children due to the mother's decreased attention (Hasan et al., 2023). According to Drennen et al., (2019), households facing food insecurity contribute to anxiety and depressive symptoms in mothers, adversely impacting responsive

caregiving. This, in turn, affects children's eating practices, as mothers may tend to restrict, pressure, and hinder the establishment of healthy eating habits in their children.

Household food insecurity arises from low income, which is influenced by various factors, such as low wages, health issues, high medical costs, etc (Luzingu et al., 2022). The socioeconomic status of a household can also be reflected in the mother's occupation, which is related to income and food security (Berra, 2020). In relation to maternal income, this study found that 87.8% of mothers were unemployed. These findings are consistent with those of Amaha & Woldeamanuel, (2021), who reported that 72.2% of unemployed mothers or housewives had children with stunting. According to Zewdu & Halala Handiso, (2020), the incidence of stunting was found to be higher among unemployed mothers compared to those who were employed. This is because working mothers are considered an indicator of women's empowerment, as their employment enables them to make household decisions, particularly regarding family nutrition practices, through the knowledge and income gained from their work. Previous findings revealed that unemployed mothers are commonly found among those with Toddlers. This is due to household responsibilities, gender roles, and social constraints, which limit women's participation in the workforce Win et al., (2022). Women play multiple roles within the family, which can impact the health and well-being of all family members. Across much of the world, culturally, women are expected to be the primary caregivers for infants and children. Typical activities carried out by women include breastfeeding, preparing food, and seeking both preventive and curative medical care, all of which are crucial for the growth and development of children (Asnakew et al., 2021).

If this situation continues, it will affect nutritional status, which impacts a child's growth and development (Dhingra & Pingali, 2021). It can also affect children's health and lead to risky behaviors that impact mental health during the transition from adolescence to adulthood (Rofiqoh et al., 2021). Because the stage of children under five years old is the most crucial development phase in human life (Sotoudeh et al., 2021). Thus, improving children's nutritional status requires a multisectoral approach (Belayneh et al., 2020). Previous research has emphasized the importance of improving household socioeconomic factors and food security status to enhance dietary diversity and nutrition patterns. Expanding food assistance programs, cash aid, and community empowerment is necessary to strengthen household food security, which in turn will help reduce the incidence of stunting (Burman et al., 2022). Based on the study findings, local governments can address food security issues by collaborating with various sectors. The local governments can optimize non-cash food assistance programs more accurate. Furthermore, follow-up on food fortification initiatives from relevant government departments and sustainable food regions should be conducted. Effective management of food security issues can contribute to reducing malnutrition in children and facilitate the achievement of sustainable development goals (Sanson-Rosas et al., 2021).

CONCLUSION

This study found a significant relationship between household food security and the incidence of stunting in toddlers aged 12-59 months in the working areas of the Padang City Health Office. The prevalence of households experiencing food insecurity is still high among children under five years old. Food-insecure households affect their access to food, preventing them from providing various foods in both quantity and quality. If this continues, it will impact the growth and development of toddlers. Thus, there is a need for strategies and policies from multiple sectors. In sensitive approaches, interventions can enhance food security, and specific approaches can improve the utilization of services and care. This issue requires special attention from relevant departments. The expectation is that, with proper

intervention, there is potential to reduce stunting. Recommendations for future studies include measuring the variety of foods consumed by toddlers, as this is likely related to household food security and impacts the growth and development of toddlers.

REFERENCES

- Abdillah, S. (2022). The Effect of Maternal and Child Factors on Stunting in Children Under Five Years in Rural Indonesia. *Knowledge E*, 813–822. <https://doi.org/10.18502//kls.v7i2.10382>
- Afework, E., Mengesha, S., & Wachamo, D. (2021). Stunting and Associated Factors among Under-Five-Age Children in West Guji Zone, Oromia, Ethiopia. *Journal of Nutrition and Metabolism*, 2021. <https://doi.org/10.1155/2021/8890725>
- Amaha, N. D., & Woldeamanuel, B. T. (2021). Maternal factors associated with moderate and severe stunting in Ethiopian children: analysis of some environmental factors based on 2016 demographic health survey. *Nutrition Journal*, 20(1), 1–9. <https://doi.org/10.1186/s12937-021-00677-6>
- Anastasia, H., Hadju, V., Hartono, R., Manjilala³, S., Sirajuddin, Salam, A., & Atmarita. (2023). Determinants of stunting in children under five years old in South Sulawesi and West Sulawesi Province: 2013 and 2018 Indonesian Basic Health Survey. *PLoS ONE*, 18(5 May), 1–17. <https://doi.org/10.1371/journal.pone.0281962>
- Argaw, T. L., Fledderjohann, J., Aurino, E., & Vellakkal, S. (2023). Children's Educational Outcomes and Persistence and Severity of Household Food Insecurity in India: Longitudinal Evidence from Young Lives. *Journal of Nutrition*, 153(4), 1101–1110. <https://doi.org/10.1016/j.tjnut.2023.02.008>
- Ashari, C. R., Khomsan, A., & Baliwati, Y. F. (2019). Validasi Hfias (Household Food Insecurity Access Scale) Dalam Mengukur Ketahanan Pangan: Kasus Pada Rumah Tangga Perkotaan Dan Perdesaan Di Sulawesi Selatan. *Penelitian Gizi Dan Makanan (The Journal of Nutrition and Food Research)*, 42(1), 11–20. <https://doi.org/10.22435/pgm.v42i1.2417>
- Asna, A. F., Ramadhanty, P. D., & Fadhilah, T. M. (2022). *The Association between Household Food Security with Stunting Incidence in Children Aged 6-23 Months in Sukaluyu and Srikamulyan Village Karawang Regency. Icsdh 2021*, 43–47. <https://doi.org/10.5220/0010758300003235>
- Asnakew, T., Abuye, C., & Taye, H. (2021). Effect of maternal employment on the nutritional status of infants and children 6 to 23 months of age in Kolfe-Keraniyo Sub-city, Addis Ababa, Ethiopia. *Ethiop. j. Public Health Nutr.*, 4(1), 64–72. <https://ejphn.ephi.gov.et/index.php/ejphn/article/view/172>
- Beckmann, J., Lang, C., du Randt, R., Gresse, A., Long, K. Z., Ludyga, S., Müller, I., Nqweniso, S., Pühse, U., Utzinger, J., Walter, C., & Gerber, M. (2021). Prevalence of stunting and relationship between stunting and associated risk factors with academic achievement and cognitive function: A cross-sectional study with South African primary school children. *International Journal of Environmental Research and Public Health*, 18(8), 1–17. <https://doi.org/10.3390/ijerph18084218>
- Belayneh, M., Loha, E., & Lindtjörn, B. (2020). Seasonal Variation of Household Food Insecurity and Household Dietary Diversity on Wasting and Stunting among Young Children in A Drought Prone Area in South Ethiopia: A Cohort Study. *Ecology of Food and Nutrition*, 60(1), 1–26. <https://doi.org/10.1080/03670244.2020.1789865>
- Berra, W. G. (2020). Household Food Insecurity Predicts Childhood Undernutrition: A Cross-Sectional Study in West Oromia (Ethiopia). *Journal of Environmental and Public Health*, 2020. <https://doi.org/10.1155/2020/5871980>
- Binagwaho, A., Rukundo, A., Powers, S., Donahoe, K. B., Agbonyitor, M., Ngabo, F.,

- Karema, C., Scott, K. W., & Smith Fawzi, M. C. (2020). Trends in burden and risk factors associated with childhood stunting in Rwanda from 2000 to 2015: Policy and program implications. *BMC Public Health*, *20*(1), 1–9. <https://doi.org/10.1186/s12889-020-8164-4>
- Budhathoki, S. S., Bhandari, A., Gurung, R., Gurung, A., & Kc, A. (2020). Stunting Among Under 5-Year-Olds in Nepal: Trends and Risk Factors. *Maternal and Child Health Journal*, *24*(s1), 39–47. <https://doi.org/10.1007/s10995-019-02817-1>
- Burman, J., Paul, B., Sembiah, S., Parida, D., Negi, R., Vantepaka, S., & Subbakrishna. (2022). Association Between Household Food Insecurity and Nutritional Status Among Children of age <5 years: A Community-based Study in a Slum of Kolkata, Eastern India. *Journal of Family Medicine and Primary Care*, *11*(7), 3885–3890. <https://doi.org/10.4103/jfmpe.jfmpe>
- Chakraborty, R., Armijos, R. X., Beidelman, E. T., Rosenberg, M., & Margaret Weigel, M. (2024). Household food and water insecurity and its association with diarrhoea, respiratory illness, and stunting in Ecuadorian children under 5 years. *Maternal and Child Nutrition*, *October 2023*, 1–13. <https://doi.org/10.1111/mcn.13683>
- Dhingra, S., & Pingali, P. L. (2021). Effects of short birth spacing on birth-order differences in child stunting: Evidence from India. *Proceedings of the National Academy of Sciences of the United States of America*, *118*(8), 1–8. <https://doi.org/10.1073/pnas.2017834118>
- Donkor, W. E. S., Mbai, J., Sesay, F., Ali, S. I., Woodruff, B. A., Hussein, S. M., Mohamud, K. M., Muse, A., Mohamed, W. S., Mohamoud, A. M., Mohamud, F. M., Petry, N., Galvin, M., Wegmüller, R., Rohner, F., Katambo, Y., & Wirth, J. P. (2022). Risk factors of stunting and wasting in Somali pre-school age children: results from the 2019 Somalia micronutrient survey. *BMC Public Health*, *22*(1), 1–11. <https://doi.org/10.1186/s12889-021-12439-4>
- Drennen, C. R., Coleman, S. M., Ettinger, S., Frank, D. A., & Chilton, M. (2019). Food Insecurity, Health, and Development in Children Under Age Four Years. *Pediatrics*, *144*(4). <https://doi.org/10.1542/2019-2430.Drennen>
- El Bilbeisi, A. H., Al-Jawaldeh, A., Albelbeisi, A., Abuzerr, S., Elmadfa, I., & Nasreddine, L. (2022). Households' Food Insecurity and Their Association With Dietary Intakes, Nutrition-Related Knowledge, Attitudes and Practices Among Under-five Children in Gaza Strip, Palestine. *Frontiers in Public Health*, *10*(February), 1–10. <https://doi.org/10.3389/fpubh.2022.808700>
- Ezeh, O. K., Abir, T., Zainol, N. R., Mamun, A. Al, Milton, A. H., Haque, R., & Agho, K. E. (2021). *Trends of Stunting Prevalence and Its Associated Factors among*. 2008–2018.
- Gassara, G., Lin, Q., Deng, J., Zhang, Y., Wei, J., & Chen, J. (2023). Dietary Diversity, Household Food Insecurity and Stunting among Children Aged 12 to 59 Months in N'Djamena—Chad. *Nutrients*, *15*(3), 1–14. <https://doi.org/10.3390/nu15030573>
- Gebreayohanes, M., & Dessie, A. (2022). Prevalence of stunting and its associated factors among children 6–59 months of age in pastoralist community, Northeast Ethiopia: A community-based cross-sectional study. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0256722>
- Gholampour, T., Noroozi, M., Zavoshy, R., Mohammadpoorasl, A., & Ezzeddin, N. (2020). Relationship between household food insecurity and growth disorders in children aged 3 to 6 in Qazvin City, Iran. *Pediatric Gastroenterology, Hepatology and Nutrition*, *23*(5), 447–456. <https://doi.org/10.5223/PGHN.2020.23.5.447>
- Gizaw, Z., Yalaw, A. W., Bitew, B. D., Lee, J., & Bisesi, M. (2022). Stunting among children aged 24–59 months and associations with sanitation, enteric infections, and environmental enteric dysfunction in rural northwest Ethiopia. *Scientific Reports*, *12*(1),

- 1–11. <https://doi.org/10.1038/s41598-022-23981-5>
- Gonete, A. T., Kassahun, B., Mekonnen, E. G., & Takele, W. W. (2021). Stunting at birth and associated factors among newborns delivered at the University of Gondar Comprehensive Specialized Referral Hospital. *PLoS ONE*, *16*(1 January), 1–16. <https://doi.org/10.1371/journal.pone.0245528>
- Hailu, B. A., Bogale, G. G., & Beyene, J. (2020). Spatial heterogeneity and factors influencing stunting and severe stunting among under-5 children in Ethiopia: spatial and multilevel analysis. *Scientific Reports*, *10*(1), 1–10. <https://doi.org/10.1038/s41598-020-73572-5>
- Hasan, M. M., Kader, A., Asif, C. A. Al, & Talukder, A. (2023). Seasonal variation in the association between household food insecurity and child undernutrition in Bangladesh: Mediating role of child dietary diversity. *Hasan, M. M., Kader, A., Asif, C. A. Al, & Talukder, A. (2023). Seasonal Variation in the Association between Household Food Insecurity and Child Undernutrition in Bangladesh: Mediating Role of Child Dietary Diversity. Maternal and Child Nutrition*, *19*(2), 19(2), 1–11. <https://doi.org/10.1111/mcn.13465>
- Kamaruzaman, N. A., Musa, A. L., Pasi, H., & Osman, I. F. (2024). Stunting and its association with feeding problem among under five children: a case-control study in Kuantan district, Malaysia. *The Medical Journal of Malaysia*, *79*(4), 436–442. <http://www.ncbi.nlm.nih.gov/pubmed/39086341>
- Kiik, S. M., & Nuwa, M. S. (2020). *Stunting Dengan Pendekatan Framework WHO* (R. Fahik (ed.)). CV. Gerbang Media Aksara.
- Luzingu, J. K., Stroupe, N., Alaofe, H., Jacobs, E., & Ernst, K. (2022). Risk factors associated with under-five stunting, wasting, and underweight in four provinces of the Democratic Republic of Congo: analysis of the ASSP project baseline data. *BMC Public Health*, *22*(1), 1–33. <https://doi.org/10.1186/s12889-022-14842-x>
- Mahfouz, E. M., Mohammed, E. S., Alkilany, S. F., & Rahman, T. A. A. (2022). The relationship between dietary intake and stunting among pre-school children in Upper Egypt. *Public Health Nutrition*, *25*(8), 2179–2187. <https://doi.org/10.1017/S136898002100389X>
- Marume, A., Archary, M., & Mahomed, S. (2023). Predictors of stunting among children aged 6-59 months, Zimbabwe. *Public Health Nutrition*, *26*(4), 820–833. <https://doi.org/10.1017/S1368980023000046>
- Masitoh, S., Nurokhmah, S., & Ronoatmodjo, S. (2023). The Correlation Between Food Insecurity Level and Stunting in Indonesia. *Jurnal Ilmu Kesehatan Masyarakat*, *13*(3), 385–398. <https://doi.org/10.26553/jikm.2022.13.2.385-398>
- Mulyaningsih, T., Mohanty, I., Widyaningsih, V., Gebremedhin, T. A., Miranti, R., & Wiyono, V. H. (2021). Beyond personal factors: Multilevel determinants of childhood stunting in Indonesia. *PLoS ONE*, *16*(11 November), 1–19. <https://doi.org/10.1371/journal.pone.0260265>
- Nagappa, B., Rehman, T., Marimuthu, Y., Priyan, S., Sarveswaran, G., & Kumar, S. G. (2020). Prevalence Insecurity at Household Level and Its Associated Factors in Rural Puducherry: A Cross-Sectional Study. *Indian Journal of Community Medicine*, *45*(3). <https://doi.org/10.4103/ijcm.IJCM>
- Najib, Rum Giyarsih, S., Listyaningsih, U., & Nawawi. (2023). Analysis of Feeding Behavior and Family Food Security as a Stunting Risk Factor in Semarang City. *Kemas*, *19*(2), 270–277. <https://doi.org/10.15294/kemas.v19i2.43144>
- Namirembe, G., Ghosh, S., Ausman, L. M., Shrestha, R., Zaharia, S., Bashaasha, B., Kabunga, N., Agaba, E., Mezzano, J., & Webb, P. (2022). Child stunting starts in utero: Growth trajectories and determinants in Ugandan infants. *Maternal and Child Nutrition*,

- 18(3), 1–12. <https://doi.org/10.1111/mcn.13359>
- Nepali, S., Simkhada, P., & Davies, I. (2019). Trends and inequalities in stunting in Nepal: A secondary data analysis of four Nepal demographic health surveys from 2001 to 2016. *BMC Nutrition*, 5(1), 1–10. <https://doi.org/10.1186/s40795-019-0283-x>
- Nsubuga, E. J., Arinda Kato, I., Lee, S., Ssenyondo, M., & Isunju, J. B. (2022). Predictors of Stunting and Underweight Among Children Aged 6 to 59 months in Bussi Islands, Wakiso District, Uganda: A Cross-Sectional Study. *Nutrition and Metabolic Insights*, 15, 1–12. <https://doi.org/10.1177/11786388221125107>
- Quamme, S. H., & Iversen, P. O. (2022). Prevalence of child stunting in Sub-Saharan Africa and its risk factors. *Clinical Nutrition Open Science*, 42(2022), 49–61. <https://doi.org/10.1016/j.nutos.2022.01.009>
- Rofiqoh, S., Widyastuti, W., Rejeki, H., Fijianto, D., & Lianasari, F. (2021). The Relationship between Parental Feeding Style and Stunting among Toddler in Central Java Indonesia. *International Academic Journal of Advanced Practices in Nursing*, 2(3), 16–22.
- Sansón-Rosas, A. M., Bernal-Rivas, J., Kubow, S., Suarez-Molina, A., & Melgar-Quiñonez, H. (2021). Food insecurity and the double burden of malnutrition in Colombian rural households. *Public Health Nutrition*, 24(14), 4417–4429. <https://doi.org/10.1017/S1368980021002895>
- Sartika, A. N., Khoirunnisa, M., Meiyetriani, E., Ermayani, E., Pramesthi, I. L., & Nur Ananda, A. J. (2021). Prenatal and postnatal determinants of stunting at age 0–11 months: A cross-sectional study in Indonesia. *PLoS ONE*, 16(7 July), 1–14. <https://doi.org/10.1371/journal.pone.0254662>
- Sekretariat Wakil Presiden RI. (2021). Laporan Baseline Program Percepatan Pencegahan Stunting 2018-2024. In *Laporan Baseline Program Percepatan Pencegahan Stunting 2018-2024*. stunting.go.id
- Sihite, N. W. (2022). Literatur Review : Keterkaitan Ketahanan Pangan Dengan Kejadian Stunting Pada Balita. *Gema Kesehatan*, 14(1), 1–10. <https://ejournal3.undip.ac.id/index.php/jnc/article/view/26992>
- Sotoudeh, M., Amaniyan, S., Jonoush, M., & Vaismoradi, M. (2021). A community-based survey of household food insecurity and associated sociodemographic factors among 2–6 years old children in the Southeast of Iran. *Nutrients*, 13(2), 1–12. <https://doi.org/10.3390/nu13020574>
- Toma, T. M., Andargie, K. T., Alula, R. A., Kebede, B. M., & Gujo, M. M. (2023). Factors associated with wasting and stunting among children aged 06–59 months in South Ari District, Southern Ethiopia: a community-based cross-sectional study. *BMC Nutrition*, 9(1), 1–16. <https://doi.org/10.1186/s40795-023-00683-3>
- Vaivada, T., Akseer, N., Akseer, S., Somaskandan, A., Stefopoulos, M., & Bhutta, Z. A. (2020). Stunting in childhood: An overview of global burden, trends, determinants, and drivers of decline. *American Journal of Clinical Nutrition*, 112, 777S-791S. <https://doi.org/10.1093/ajcn/nqaa159>
- Win, H., Shafique, S., Mizan, S., Wallenborn, J., Probst-Hensch, N., & Fink, G. (2022). Association between mother’s work status and child stunting in urban slums: a cross-sectional assessment of 346 child-mother dyads in Dhaka, Bangladesh (2020). *Archives of Public Health*, 80(1), 1–16. <https://doi.org/10.1186/s13690-022-00948-6>
- World Health Organisation. (2022). World health statistics 2022 (Monitoring health of the SDGs). In *World Health Organisation 2022*. <http://apps.who.int/bookorders>.
- Zewdu, D., & Halala Handiso, Y. (2020). Under-nutrition of 2–5 years old children and associated factor among employed and unemployed women: Comparative cross-sectional study. *Cogent Food and Agriculture*, 6(1). <https://doi.org/10.1080/23311932.2020.1801215>.