

Food Security on The Incidence of Stunting in Agricultural Areas

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ABSTRACT

Child stunting is a global health problem, and the national prevalence of stunting is high. Stunting indicates failure of child development due to chronic malnutrition. Other causes of stunting can also be influenced by food security, parenting, environmental sanitation, or access to health services. In agricultural areas, one of the efforts that the community can make to reduce stunting rates is to maintain food security to prevent stunting in children. This study aims to determine that food security can reduce the prevalence of stunting in agricultural areas. The literature search used Google Scholar, PubMed, and ScienceDirect databases. The inclusion and exclusion criteria of the articles included national and international articles using Indonesian and English from 2020-2024. It was found that local food security is effective in preventing stunting in agricultural areas, and some factors affect food security, namely economic factors or individual income. The presence of household food security affects the incidence of stunting. Stunting increases when there is no food security, which coincides with the pre-harvest season. Low food security (food variety and quantity) can negatively impact the risk of stunting. As health workers, nurses must undoubtedly play a role in reducing stunting rates, one of which is by providing education or becoming educators for the community about the importance of food security in reducing the incidence of stunting.

Keywords: stunting; food security; agriculture

INTRODUCTION

Stunting is a condition of stunted growth in children caused by chronic malnutrition in the womb or during childhood. Chronic malnutrition in children will result in impaired brain development and physical growth, which makes it difficult for children to walk and talk, are susceptible to disease, and can increase mortality and morbidity. Other causes of stunting can also be influenced by food security, parenting, environmental sanitation, or access to health services (Fitriahadi et al., 2023). Based on WHO standards, the condition of height for age (TB/U) in stunted children is a z-score <-2 SD. The stunting condition will last until adulthood if not given treatment or handling during growth (Anggraeni et al., 2023)

Handling stunting health problems is a top priority in Indonesia. Globally, Indonesia is the fifth highest country, with a stunting prevalence rate of 36%. At the national level, according to the results of the Indonesian Nutrition Status Survey (SSGI) in 2022, the stunting rate in Indonesia was 24.4% (Yulmaniati et al., 2022). However, this figure has yet to reach the expected limit set by WHO, which is under 20%. The Indonesian Basic Health Research reported that in 2018, 29.9% of children under the age of two were stunted, and 30.8% of children under five were stunted. So, the Indonesian government targets the stunting rate to reach 15% by 2025, with the target of stunting prevalence decreasing by 3% yearly (Prastia et al., 2023).

Prevention of stunting needs to be done early when the fetus is still in the womb. The first 1000 days of life is a period of growth for children to achieve optimal development and growth. Children with nutritional problems in this period can still correct their growth delays if provided with adequate nutritional intake. If this is not done, stunting will continue into the next period of life. One solution that can be done is to maintain healthy and quality food security to fulfill children's nutrition (Prastia et al., 2023; Kurniyawan et al., 2023).

Food security is a condition of food fulfillment for the state to individuals in society, which focuses on food that is sufficient in quantity and quality, nutritious, safe, diverse, affordable, equitable, and not against the beliefs, religion, and

culture of the community so that they can live healthy, productive, and active lives sustainably (Rumawas et al., 2021; Deviantony et al., 2024). According to the National Planning and Development Agency in 2018, food security is an influential factor in stunting associated with community access to nutritious food (Sihite et al., 2021).

Agricultural areas are areas with human activities that cultivate crops, farming, gardening, animal husbandry, forestry, and fisheries. In Indonesia, most of the people are farmers who work in agricultural areas, so it is one of the things that has constantly been developed in our country. Agriculture is an area that produces the most food crops to meet human needs. Food from agriculture needs to be appropriately utilized because it dramatically affects human life. This also includes nutritional adequacy, especially in children (Lasaksi, 2023; Afandi et al., 2023; Nur et al., 2023).

METHOD

The literature search process for this review article used a trusted database. The data used is secondary data obtained from search engines Google Scholar, PubMed, and ScienceDirect, ranging from 2020 to 2024. The inclusion and exclusion criteria were national and international articles using Indonesian and English. The search used several keywords in Indonesian and English. The Indonesian search used the keywords "Stunting," "Ketahanan Pangan," and "Pertanian." The English search used the keywords "Stunting," "Food Security," and "Agriculture." The method used in analyzing the selection of articles was the PRISMA method. The selected article data were then summarized in a table organized by author/journal identity, journal title, objectives, population and sample, methods, and summary of results. The research results and extraction of materials from each study were then synthesized and presented. The eligibility criteria for this study were as follows: Inclusion Criteria (1) The research was conducted from 2020 to 2024; (2) This journal discusses the effect of oxytocin massage on breast milk production of postpartum mothers. Exclusion criteria are (1) journals that cannot be downloaded and (1) journals that do not discuss stunting, food security, and agriculture.

The selection stage of the articles found was carried out by determining the following keywords: stunting, food security, and agriculture. The keywords used in the literature search used keywords and Boolean operators (AND and OR). Journal identification was carried out through Google Scholar, Science Direct, and PubMed and found 81,127 journals that match the keywords with details of Google Scholar as many as 76,930, PubMed as many as 148, and ScienceDirect as many as 4,049. We then selected the literature based on the 2020-2024 inclusion criteria. We found 21,985 fewer journals with details of Google Scholar, as many as 19,900, PubMed as many as 70, and ScienceDirect as many as 2,015. Next, we identified appropriate titles and obtained 218 journals with the exclusion criteria of journals that could not be downloaded; then, we identified the suitability of the abstract and obtained 23 journals.

Finally, we identified the literature according to the criteria that could be analyzed and found the top 10 journals. The next step is to research titles, create abstracts based on eligibility criteria, conduct article exploration to find suitable articles, and check the bibliography to determine the relevance of the writing. The data type includes research title, researcher, journal name, institution name, and findings relevant to the problem under study.

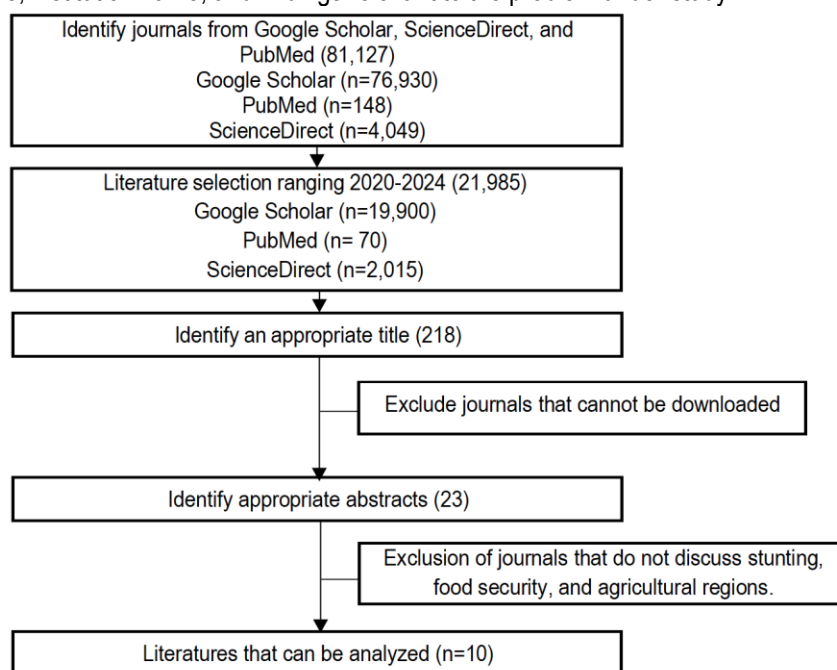


Figure 1. Flow Diagram of Analysis Literature Based on PRISMA

RESULTS

Based on the results of the literature search process on the effect of food security on the incidence of stunting in agricultural areas through several databases, ten articles were found relevant to the inclusion and exclusion criteria used in the research method. The ten articles consisted of five national articles and five international articles, which were then selected as material for conducting a literature review. The researcher then explained the results, discussed each study in each article, and concluded that using local food ingredients effectively prevents stunting in agricultural areas.

Table 1. Result of Article Analysis

ID	Author and Journal Identity	Journal Title	Objective	Population and Sample	Method	Summary of Result
A1	Author: Sihite, Nathasa Weisdania., Nazarena, Yunita., Ariska, Firda., Terati Journal Identity: Jurnal Kesehatan Manarang/ 2021/Vol.7 DOI: https://doi.org/10.33490/jkm.v7iKhusus.550	Analysis of Food Security and Characteristics of Households with Stunting Incidence	We are assessing the condition of food security of households experiencing stunting, analyzing food diversity and diet towards stunting, and knowing strategies and efforts to overcome stunting.	Respondents were 40 households with populations in two villages in the Gunungsari sub-district, West Lombok, that experienced stunting.	A cross-sectional method with data collection techniques was used through interviews, observation, and direct measurement.	The result of this study is that there is an influence between food security in the incidence of stunting. It is shown that the more family members there are, the less optimal the distribution of nutrition to children is.
A2	Author: Riajaya, Hadi dan Munandar, Adis Imam Journal Identity: Jurnal Agrisep/2020/Volume 19 (02) DOI: 10.31186/jagrisep.19.2.255-27	Food Security Improvement Strategy to Minimize Stunting in Sukabumi Regency	Map the level of community food security and formulate strategies to improve food security and minimize the incidence of stunting in Sukabumi District.	The samples used in this study were the Head of the Food Security Office of Sukabumi District, the Head of the Agriculture Office of Sukabumi District, the Head of the Health Office of Sukabumi District, the Head of the Availability Division, the Head of the Distribution Division, the Head of the Consumption Division; and Head of Public Health Division.	Using descriptive qualitative with EFE (External Factor Evaluation) and IFE (Internal Factor Evaluation) data analysis formulated in a SWOT (Strength Weakness Opportunity Threat) analysis. The research approach uses the Global Food Security Index and the Food Security and Vulnerability Atlas.	All levels of society can reach food security in terms of the affordability dimension; the availability dimension of the amount of food available has met the ideal standard, while the quality and safety dimension has not met the ideal standard.
A3	Author : Asih, Dewi Nur., Erny., Kallaba, Yulianti., Fahrudin., Safitri, Dian Jurnal Identity: Agroland:	Household Food Access and Security in Stunting Locus Areas in Toli-Toli Regency	to determine household food security and its relationship with the incidence of malnutrition in the Toli-Toli District area	A sample of 42 households in two villages with the population in the neighborhood of Bangkir and Donko villages, Toli- Toli.	Quantitative and qualitative methods are used through interviews, surveys, and direct observation.	Household income from agricultural products affects the ability of households to obtain food security and family nutrition. Access to food is still lacking, and household food expenditure falls into the category of food

ID	Author and Journal Identity	Journal Title	Objective	Population and Sample	Method	Summary of Result
	Jurnal Ilmu-Ilmu Pertanian/ 2024Vol.31(1) DOI : https://doi.org/10.22487/agrolandnasional.v31i1.1898					insecurity.
A4	Author: Adinia, Septa and Choiriyah, Ilmi Usrotin Journal Identity: Equilibrium2024/13(1) DOI: http://dx.doi.org/10.35906/equilibrium.v13i1.1896	Food Security Program Strategy in Overcoming Stunting in Ketapang Village, Tanggulangin District, Sidoarjo Regency	To analyze the strategies of the Food Security program to reduce the incidence of stunting in Ketapang Village, Sidoarjo.	The sample is informants from local village leaders, such as the Village Head, Village Secretary, and Parents of former stunting sufferers in the Ketapang Village Government, Tanggulangin District, Sidoarjo Regency.	The methods used in collecting data are interviews and observations of local villages	The Food Security Program strategy to prevent stunting in terms of the environment shows that the stunting rate has decreased. In addition, the program strategy in terms of learning has also been well implemented to educate about nutrition in children so that parents' understanding increases and reduces the stunting rate.
A5	Author : Nurjannah, Siti, Syarifudd, Yanuartati Baiq Yulfia Elsadewi Journal Identity: Agrimansion/2021/Vol. 22 (03) DOI: https://doi.org/10.29303/agrimansion.v22i3.706	Critical Study of Household Food Security and the Phenomenon of Stunting: A Case Study of Two Villages in Gunungsari District, West Lombok Regency	To monitor and analyze the food security of stunted households and other factors that influence the incidence of stunting in Palembang City.	This study used 40 samples and a population of toddlers aged 0-59 months who had been recorded in the 11 Ilir Health Center environment.	Qualitative methods were used to measure the subjective behavior of respondents, and quantitative methods were used to measure behavior toward food security and stunting.	The result of this study is a vulnerable status in household food security due to the adequacy of food supply, food stability, and food quality and safety. Several factors cause stunting, namely social, environmental, social, and environmental factors.
A6	Author: Belayneh, M., E. Loha, and B. Lindtjorn Journal Identity: Ecology of Food and Nutrition/ 2021/60(1)/ 44-69 https://doi.org/10.1080/03670244.2020.1789865	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	To evaluate seasonal patterns of household food insecurity, dietary diversity, and household characteristics on wasting and stunting among children in households followed for 1 year in the drought-prone areas of Sidama, Ethiopia.	The final sample of this study included 897 households with 935 children. Respondents at interviews were biological mothers unless they had died or were divorced.	This study used a pre-tested and structured questionnaire to collect information about household conditions, health and nutritional characteristics of children, household food diversity, and household food security. Researchers used four seasonal categories for data collection based on the region's agricultural cycle.	This study found that household food insecurity increases the risk of child wasting during the period of highest food scarcity. The risk of low household food consumption also increases during the period of the highest food insecurity. Poverty levels, education, employment, household food insecurity, and dietary diversity were associated with wasting or stunting in children. The data in this study shows that household food insecurity was a more pronounced predictor of stunting and

ID	Author and Journal Identity	Journal Title	Objective	Population and Sample	Method	Summary of Result
A7	Author: Kehinde, T., and E. Favour Journal Identity: Journal of Food Security/ 2020/8(3)/ 98-104 DOI:10.12691/jf s-8-3-3	Food Insecurity and Nutrition Status of Farm Households in Northwestern Nigeria	To assess the state of household food insecurity, household dietary diversity, household nutritional status, and the relationship between food insecurity and household nutritional indices in Northwestern Nigeria.	The study used a randomly selected sample of 302 farm households in Northwestern Nigeria.	The questionnaire was used to collect data after pre-testing 30 households with the same background as the research sample. Household food insecurity was measured using the Household Food Insecurity Assessment Scale (HFAS) for 30 days. Dietary diversity was measured using the 24-hour food recall method based on food consumed over 24 hours. The nutritional status indicators used were weight-for-height, weight-for-age, and height-for-age Z- scores, created using WHO population standards and exported to SPSS.	wasting compared to household food diversity. This study found that food insecurity, low dietary diversity in households, and stunting in children are still quite high. Income and educational attainment are associated with food insecurity. The levels of stunting, wasting, and underweight indicate that malnutrition is a health problem among children in Northwestern Nigeria. Household food insecurity was significantly associated with wasting and stunting in the target- age children studied in the study.
A8	Author: Yazew T. Journal Identity: Journal of Nutrition and Metabolism/ 2022/Article ID 3981417/1-8 https://doi.org/10.1155/2022/3981417	Risk Factors of Stunting and Wasting among Children Aged 6–59 Months in Household Food Insecurity of Jima Geneti District, Western Oromia, Ethiopia: An Observational Study	To determine the risk factors associated with stunting and wasting in children aged 6-59 months in Jima Geneti district, West Oromia, Ethiopia.	The study sample was randomly selected from households with children aged 6-59 months. Mothers with children aged 6-59 months who had lived in the Jima Geneti District for six months were included in the study. Children aged 6-59 months who were deformed or chronically ill and mothers who were deaf were excluded from the study.	This study used a community-based cross-sectional study design. Sociodemographic and economic factors were collected from mothers/caregivers. Dietary diversity score (DDS) and 24-hour recall methods were conducted regarding children's food intake 24 hours prior to the survey. Household food insecurity (HFI) was measured with the Household Food Insecurity Access Scale (HFIA), which consists of questions relating to the household's experience of food insecurity in the 12 months prior to the survey.	This study found a high prevalence of stunting and wasting among children aged 6–59 months in household food insecurity in the Jima Geneti district. This study found that low wealth status and poor diet were associated risk factors for stunting. Child meal frequency, the children who were fed leftover foods, and poor dietary diets were also associated with risk factors for wasting.

ID	Author and Journal Identity	Journal Title	Objective	Population and Sample	Method	Summary of Result
					Anthropometric measurements were conducted using procedures from the World Health Organization (WHO) guidelines. The data obtained were analyzed using the SPSS version 20.0 program. Child nutritional status was created using the WHO Anthro program.	
A9	Author: Iqbal, Meesha, Kausar, Khan, et al. Journal Identity: Eastern Mediterranean Health Journal/2020/26(9)/1087-1096 https://doi.org/10.26719/emhj.20.040	Malnutrition and food insecurity in child laborers in Sindh, Pakistan: a cross-sectional study	To assess the food security, food intake, and nutritional status of child laborers aged 5–14 years working in lower Sindh, Pakistan	The sample size of this study was calculated assuming a proportion of stunting in child laborers of 26%, relative precision of 25%, and 95% confidence level. The minimum sample needed was 318 children after increasing based on a 10% refusal rate.	This study used a respondent-based sampling techniques to recruit child laborers aged 5–14 years who work in agriculture, the manufacturing industry, hotels and restaurants, domestic work, and migrant child laborers working in vegetable markets. Sociodemographic and nutritional information was obtained through interviewer questionnaires. Children's height and weight were measured to assess stunting and wasting.	This study obtained the results that the nutritional status and food insecurity of the child laborers of Pakistan are comparable with the general population, highlighting the grave situation of the country about food security.
A10	Author: Nabuuma, D., et al. Journal Identity: AIMS Agriculture and Food/2021/6(2) : 644-662 DOI: 10.3934/agrfood.2021038	Food security and sources linked to dietary diversity in rural smallholder farming households in central Uganda.	To explore the dietary diversity of children under five and the food security of smallholder farm households in Central Uganda.	The samples used in this study were 10 villages selected randomly, and 182 households in these villages were sampled using systematic random sampling.	This study used a cross-sectional study among rural smallholder farming households from Kiboga district to assess household characteristics, dietary diversity, and food security status.	This research shows that stunting and household food insecurity are caused by low consumption of foods rich in micronutrients. It is essential to emphasize food diversity amidst food access and limited availability, production, and consumption.

DISCUSSION

Adequacy of food reserves, food stability, accessibility, affordability, food quality, and safety are the main factors of food security (Sihite et al., 2021). Meanwhile, according to research by Riajaya & Adis (2020), the main factors of food security consist of food availability, supply/availability stability, affordability, and utilization. Household food security is divided into quantitative aspects measured based on household energy adequacy and qualitative aspects measured based on hunger levels, food availability, and household income (Sihite et al., 2021).

Based on research conducted by Sihite et al. (2021), household food security affects the incidence of stunting. The condition of food security in households is most influenced by income, so households cannot afford to buy food for family needs, especially food to meet the nutrition needs of toddlers. This is in line with research conducted by Asih et al. (2024), which found that household food access is strongly influenced by income. When there is an increase in income, access to and consumption of foods that are high in nutrition will also increase.

In the post-harvest season, it was found that the food security conditions of farming households would improve compared to the pre-harvest season. The incidence of stunting in this study increased when there was no food security, which coincided with the pre-harvest season (Belayneh et al., 2020). This is contrasted with research conducted by Kehinde & Eforuoku (2020), farmers experience poor food security when harvest time arrives because they need to sell their harvest, pay off debts, and buy raw materials, leaving only a small amount of harvest, which is not enough for consumption throughout the year. Thus, the variety of food consumed needs to be fulfilled due to low income.

The lack of varied food consumption is because most people cannot afford to buy animal products due to high prices, resulting in a lack of micronutrients (Belayneh et al., 2020). Especially households in rural areas and those with less income will find it challenging to access nuts, seafood, meat, and other micronutrients, which can lead to child stunting (Kehinde & Eforuoku, 2020).

Low food security (food variety and quantity) can negatively impact nutritional status, resulting in recurrent infections, abnormal growth, and poor body function. Farmers in this situation tend to skip meals, reduce meal portions, and buy less nutritious food by prioritizing buying cheap food. They also never eat the food they like. This is in line with research conducted by Yazew (2022), which found that households that do not have food security can be indicated by the amount of food consumed less than their needs and households that do not eat the food they like.

Food security is also influenced by education level. People with higher education will buy food by paying attention to a balanced nutritional diet (Kehinde & Eforuoku, 2020). This is in line with research by Sihite et al. (2021), which states that households that do not have food security are caused by a lack of knowledge related to balanced nutrition, worrying about food supplies running out, and being unable to buy staple foods due to financial limitations.

CONCLUSION

The main factors in food security are availability, supply/availability stability, affordability, and utilization. There is an influence of aspects of food security on the incidence of stunting. In addition, the food aspect is influenced by income, so if the income earned is low, it can affect the level of nutritional adequacy consumed, and this also causes less variety of food consumed so that children will lack micro substances that are needed by the child's body. Food security Relatively low food security can also lead to several conditions, such as recurrent infections, abnormal growth, and poor body function. With the results of this study, nurses can apply their role as educators to prevent stunting in agricultural areas. Nurses can conduct counseling and health promotion campaigns for communities in agricultural areas about food security by utilizing local food to prevent stunting.

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