OPTIMIZING FAMILY FOOD SECURITY AS AN EFFORT TO PREVENT STUNTING: A LITERATURE REVIEW

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ABSTRACT

Background: Stunting in children under five is a global public health problem caused by a variety of factors, including inadequate nutritional intake patterns, poor environmental hygiene, and low family food security Optimizing food security in stunting prevention is an important strategy to ensure that every individual, especially pregnant women, breastfeeding mothers, and children, gets adequate nutritional intake, safe, and nutritionally balanced to support optimal growth and development. The purpose of the study is to identify the optimization of the role of family food security as an effort to prevent stunting in toddlers based on a literature review.
Methods: A systematic review was conducted of 866 articles from the Science Direct, PubMed, and ProQuest databases for the period 2015–2025. The selection was carried out using the PICOS approach and inclusion criteria in the form of quantitative studies (cross-sectional, cohort, case-control, experimental) that examined food security and stunting in toddlers. A total of 37 articles were eligible and analyzed using the PRISMA guidelines.
Results: 37 journals discussed the optimization of food security and stunting
Discussion: Household food security is proven to be a key factor in the prevention of stunting in children under five. Food insecurity, especially those that cause low dietary diversity and quality of nutritional intake, contribute significantly to the occurrence of stunting. Stunting prevention strategies must include strengthening the four pillars of food security: availability, access, utilization, and stability. The most effective interventions are multisectoral approaches that combine specific nutrition interventions and sensitive interventions. National food policy needs to ensure that food security is measured at the household level, not just on national food availability.

Keywords: food security; stunting; toddlers

1. Introduction

Stunting is a chronic growth disorder in children identified based on height by age that is below -2 standard deviations (SD) from the median WHO child growth standard. Stunting reflects chronic malnutrition that lasts from pregnancy to the first two years of life, known as the first 1,000 days of life (Organization & Fund, 2020; Victora et al., 2021).

According to UNICEF data (2021), around 22% of children under five in the world are stunted, with the highest prevalence in South Asia and Sub-Saharan Africa. In Indonesia, the prevalence of stunting is still high, reaching 24.4% in 2021. East Nusa Tenggara Province has the highest prevalence, reaching more than 30%, while several other regions, including West Kalimantan and Papua, also show significant prevalence rates. Key risk factors include poor nutritional intake patterns, inadequate sanitation, recurrent infections, and low household food security (UNICEF, 2021; Miranda et al., 2023; Suratri et al., 2023).

Stunting has significant short- and long-term impacts. In the short term, children who are stunting have a higher risk of infection, delayed motor development, and low cognitive ability. In the long term, the impacts of stunting include decreased cognitive capacity, increased risk of degenerative diseases such as diabetes and hypertension, and low productivity in adulthood. In addition, stunting can strengthen the cycle of poverty

between generations, reduce educational opportunities, and reduce individual competitiveness in the job market (Qar et al., 2013; Kukeba et al., 2021).

One of the main factors that affect the incidence of stunting is family food security**.** Food security is a condition for meeting food needs both in terms of availability, access, and sustainable use of food for a healthy and active life. Families that have good food security tend to be able to provide balanced nutritious food for all family members, including children under five, so that the risk of stunting can be minimized (Boliko, 2019; Haddad, 2015).

Food security is influenced by various factors, including family income, maternal education, access to nutritious food, and child-feeding practices. Mothers as the main managers of household food play an important role in ensuring that children get enough and quality food. Research by Kusumajaya et al. (2022) shows that children from families with low food security have a 2.5 times higher risk of stunting compared to children from families with good food security (Kusumajaya, 2015).

In addition, aspects of food utilization also include dietary behavior, nutritional knowledge, and sanitation and environmental health. Without proper utilization, the availability of food alone is not enough to prevent stunting. Therefore, nutrition intervention programs that emphasize family nutrition education, strengthening the household economy, and empowering women in food management are crucial (Leroy Et al., 2018).

By looking at the complexity of the factors that affect stunting, prevention approaches need to involve strengthening family food security as the main strategy. Food security is not only an indicator of economic well-being, but also a key determinant of children's nutritional status. Therefore, this research is important to find out the role of family food security as an effort to prevent stunting, especially in high-risk communities. This Literature Review aims to analyze the Optimization of the Role of Food Security as an effort to prevent Stunting in children under five.

2. Methodology

2.1 Search strategy

This literature study through a search of scientific publications ranges from 2015-2025. The databases used are Pubmed, Science Direct, Proquest. The literature search was conducted with four keyword groups based on *Medical Subject Heading* (MeSH) and combined with Boolean operators AND, OR and NOT, keywords *("food security" OR "family food security" OR "household nutrition") AND ("stunting prevention" OR "stunting reduction" OR "child malnutrition prevention").* A literature search found 866 articles that were filtered using the keywords above.

Articles were then narrowed down and identified based on PICOS (*population, intervention, comparison, outcomes* and *study design)* and 57 articles were obtained that could be included in the article screening process. Then an eligibility selection was carried out based on the essence and scope of discussion in the article as a whole, as many as 37 articles could be made for the next selection.

2.2 Inclusion and Exclusion Criteria

The selection of predetermined inclusion criteria for this systematic review was carried out using the PICOS (population, intervention, comparator, output, and study design) approach. The population in this study is children/parents who are targeted for interventions or observations related to stunting. The selected studies are quantitative studies, including cross-sectional, cohort, case-control, and experimental studies, which examine the relationship between family food security and stunting events.

The exclusion criteria include: (a) studies that do not specifically address stunting or do not cover food security variables; (b) studies that do not involve children under five years of age as the primary population; (c) laboratory or animal-based research; The following is the flow of PRISMA in journal invenatization in the preparation of this review literature:

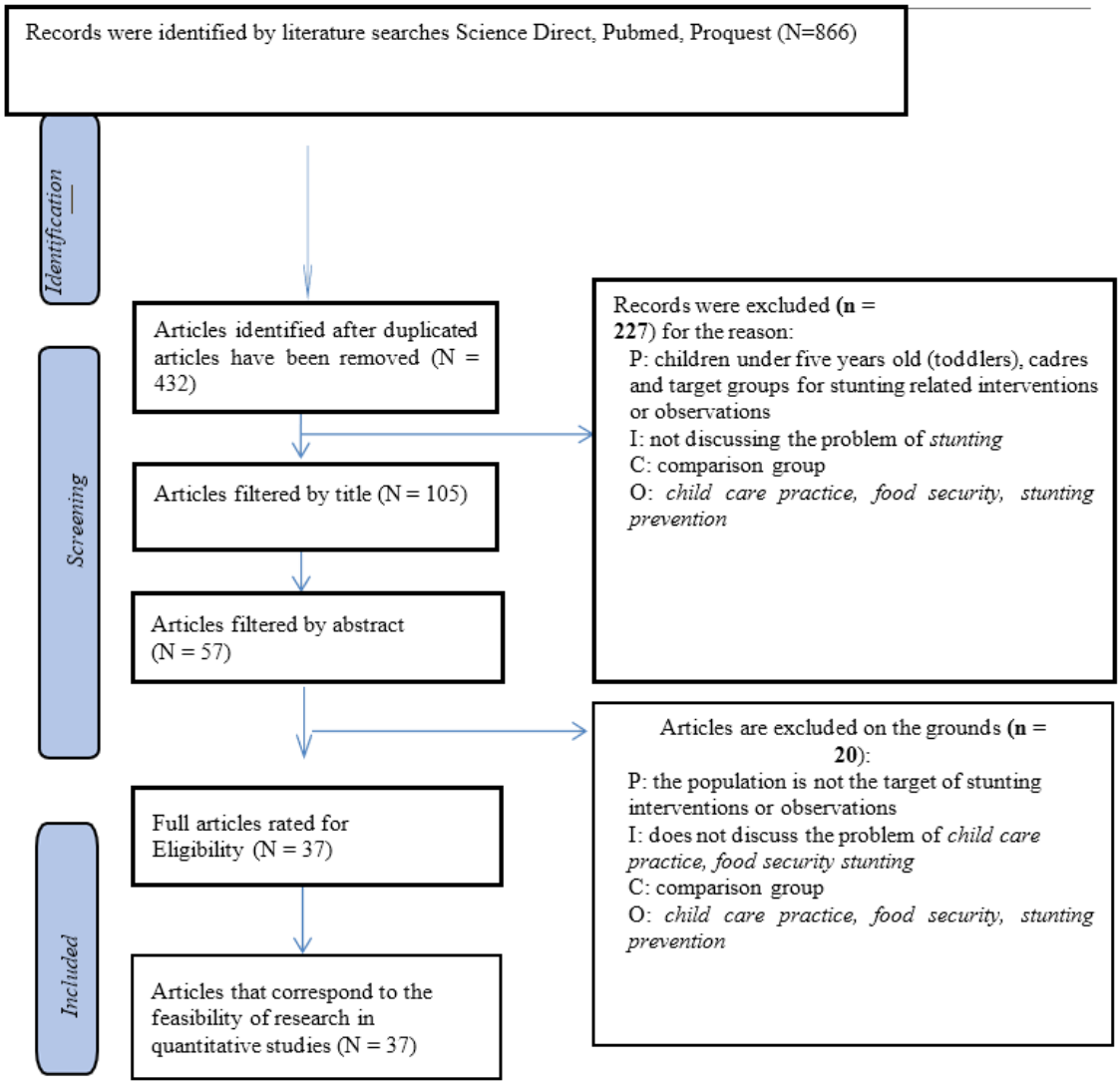

Figure 1. PRISMA

3. Results

Table 1. Optimizing the Role of Family Food Security as an Effort to Prevent Stunting by using DSVIA (Design, Sample, Variable, Intervention, Analysis)

No	Research Title	Method (DSVIA)	Result
1	A high prevalence of stunting was observed among under-five children: A community-based cross-sectional study 2025 (Mulatu et al., 2025a)	**D:** A community-based cross-sectional study conducted in Pawie District, Ethiopia, on children aged 6–59 months to determine the prevalence of stunting and related factors. **Q:** 841 children aged 6–59 months and direct interviews with mothers using a structured questionnaire. **V:** The prevalence of stunting and the sociodemographic, clinical, and environmental factors associated with stunting. **I:** Anthropometric measurements, data processing using Epi Info and SPSS, bivariate and multivariate logistic regression analysis for identification of related factors. **A:** Determine the prevalence and risk factors of stunting and present results in the form of tables, graphs, and narratives.	The prevalence of stunting in children aged 6–59 months is 37.2%. Factors significantly associated with stunting include: child age, maternal education, maternal occupation, history of malaria, colostrum feeding, and feeding frequency. This study shows a fairly high prevalence of stunting and many associated risk factors. Therefore, maintaining food security at the household level and increasing the awareness of mothers and caregivers is very important to reduce stunting in children under 5 years old.
2	Associations between child neglect, informal interventions in food neglect, and child stunting: Evidence from the Ghana families study 2025 (Abdullah et al., 2025a)	**D**: A three-stage national survey study involving 1,100 female caregivers in Ghana, both urban and rural, using a neglect scale and informal interventions related to food neglect. **Q**: Female caregivers in 22 settlements in Ghana were randomly selected proportionally, with interviews and filling out questionnaires to report neglect and informal interventions. **V**: Child stunting, child neglect, informal intervention in food neglect, and the collective value of Ubuntu in childcare. **I**: The analysis used a mixed logistics model to estimate the association between neglect, informal interventions, and stunting. **A**: Assess the relationship between child neglect, informal interventions in food neglect, and child stunting and identify the role of Ubuntu's collective values in stunting prevention.	The prevalence of stunting in Ghana in this sample is 70.3% ± 3%. Informal interventions in food neglect were associated with a lower likelihood of stunting (OR = 0.62; $p < 0.014$). The risk of stunting doubled for each increase in commitment to the collective value of childcare and stunting prevention called Ubuntu (OR = 0.50; $p < 0.035$). The study concludes that promoting collective values in parenting and conducting informal interventions against food neglect can be effective ways to reduce the prevalence of stunting in Ghana.
3	Household food insecurity and nutritional status of pre-school children following relaxation of corona virus disease-2019 (COVID-19) restrictions	**D**: Cross-sectional studies **Q**: Pre-school-aged children in Irbid, Jordan, 386 pre-school-aged children (<5 years) in Irbid, Jordan, after the easing of COVID-19 restrictions were selected by a simple random sampling method. **V**: Household food insecurity (HFI), child nutritional status (stunting, wasting, underweight), and related factors such as food expenditure, family income, and	The prevalence of household food insecurity among pre-school children in Irbid was 19.9% for moderate food insecurity and 38.3% for severe food insecurity. The prevalence of malnutrition was 1.81% wasting, 1.55% underweight, and 1.26% severely wasting. There was a significant negative correlation between HFI and WHZ, WAZ, and BMI-for-age z-score in children.

No	Research Title	Method (DSVIA)	Result
	(Anaqreh et al., 2025a)	number of children. **I**: HFI measurement with Food Insecurity Experience Scale (FIES) and nutritional status with WHO growth standards; correlation analysis and descriptive statistics. **A**: To measure the prevalence of HFI and malnutrition in pre-school children and to examine factors related to both after the easing of COVID-19 restrictions.	Factors such as maternal age, number of children in the family, family income, monthly expenditure on food and energy contribute significantly to food insecurity. The study showed a high prevalence of HFI in children under 5 years of age despite COVID-19 restrictions having been eased, as well as a significant association between HFI and children's nutritional status.
4	The role of parental child marriage in children's food security and nutritional status: a prospective cohort study in Indonesia 2024 (Oliveira et al., 2024a)	**D**: A prospective cohort study that analyzed data from the Indonesia Family Life Survey (IFLS) waves 4 (2007) and 5 (2014) with 1,612 households. **Q**: Children from families in Indonesia, especially those whose parents are child marriages. **V**: Food security status and nutritional status of children Consumption Scores). **I**:. (stunting, BMI-for-age z-score, Food **A**: OLS regression analysis and binary logistics to examine the relationship between parental child marriage and child food security and nutrition status Using IFLS longitudinal data to investigate the impact of child parental marriage on child food security and child nutritional status.	The analysis showed that the marriage of a child's parents correlated with a higher probability of children experiencing stunting and food insecurity. Child marriage was also correlated with a higher BMI-for-age z-score, which increases the risk of obesity, as well as with lower food consumption scores. This study recommends the implementation of community initiatives, economic empowerment, access to health services, and gender-sensitive and integrated policies to improve food security and nutritional status of children in families affected by child marriage.
5	Dietary Diversity, Household Food Insecurity and Stunting among Children Aged 12 to 59 Months in N'Djamena— Chad (Gassara et al., 2023a) **(5)**	**D:** Cross-sectional study **S:** 881 households with children 12–59 months in N'Djamena, Chad **V:** Dietary diversity, household food security, stunting **I:** DDS, HFIAS, anthropometric measurements **A:** Logistic regression	The prevalence of severe household food security is 16.6%. The prevalence of stunting in children is 25.3%. The average DDS is 6.5 ± 1.6. Severe food insecurity is significantly associated with stunting (OR 2,505; CI 1,670–3,756). Dietary diversity (DDS) and stunting did not show a significant relationship. Conclusion: The prevalence of household food security and stunting is quite high. Household food security and household size are significantly associated with stunting.
6	Household Food Insecurity and Demographic Factors, Low Birth Weight and Stunting in Early Childhood:	**D**: Longitudinal Study **Q**: Women who give birth and their children, with data on birth weight and height (stunting). **V**: Household food safety, alcohol consumption, blood pressure, food	Birth weight data is available for 1,173 children and height data for 1,216 children. The prevalence of LBW was 14.7%, while stunting and severe stunting were 17.8% and 14.5%, respectively. Household child hunger, maternal hypertension, and

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	Findings from a Longitudinal Study in South Africa (Harper et al., 2023)	expenditure, dietary diversity, maternal height, and other risk factors. **I**: Regression analysis to see the relationship between these factors with low birth weight (LBW), stunting, and severe stunting in children. **A**: Using longitudinal data to assess the impact of food safety and other factors on LBW and stunting.	maternal alcohol consumption are associated with low birth weight. Food expenditure below the poverty line, as well as low dietary diversity are associated with stunting and severe stunting. Maternal height and low birth weight are also related to stunting and severe stunting.
7	Small area vulnerability, household food insecurity and child malnutrition in Medellin, Colombia: results from a repeated cross-sectional study (Santa-Ramírez et al., 2023)	**D** : cross-sectional study. **S** : households with children and children under five years of age **V** : Area-level vulnerability as the main predictor; household food insecurity and child anthropometric indicators (underweight, stunting, wasting, overweight). **I** : Data from the Living Standards Measurement Survey (LSMS) and nutrition monitoring system in Medellin, Colombia, 2017-2018 A: A mixed-effect Poisson regression model with robust standard error to test the relationship between regional vulnerability quintiles and food insecurity and child malnutrition.	Households with children living in the highest vulnerability areas had a 1.9-fold higher prevalence of food insecurity compared to the lowest vulnerability areas (PR 1.91; 95% CI 1.42–2.57). Similar results were found for the risk of underweight (PR 1.26; 95% CI 1.11–1.42), the risk of stunting (PR 1.36; 95% CI 1.22–1.53), and stunting (PR 1.93; 95% CI 1.55–2.39) in children under five years of age. No consistent relationship was found between the level of vulnerability of the area and wasting or overweight. The study shows that the level of regional vulnerability plays a role in the increased prevalence of food insecurity and child malnutrition in Medellin, Colombia.
8	Household food security, child dietary diversity and coping strategies among rural households. The case of Kole District in northern Uganda (Elolu et al., 2023a)	**D : Cross section** **S**: (162 mothers and caregivers of children aged 0-36 months in Kole district, Uganda (rural). **V**: Household food security status, diversity of children's diets, feeding practices, and household coping strategies against food insecurity. I: **A:** Cross-sectional study to assess food safety status, diversity of children's diets, and household coping strategies. An analysis of the relationship between household food security and children's dietary diversity, feeding practices, and coping strategies.	Most households (55%) are declared food safe, but the level of dietary diversity of children is low (68.1% for 6-23 months and 55.3% for 24-36 months of age). Starch-based foods from cereals, tubers, and roots are the main food group (82%) in child feeding, with consumption limited to fruits, vegetables, meat, and dairy products (18% combined). Only 57% of children aged 0-6 months receive exclusive breastfeeding, and the introduction of complementary foods is often late and poorly planned. The main coping strategies implemented by households include the use of less preferred foods (54.9%), limiting meal portions (35.2%), reducing the frequency of meals (29%), and collecting wild fruits and harvesting young plants (29.6%). Household food safety is a strong determinant of the diversity of children's diets and influences feeding practices and coping strategies used. Nutrition education, household size, and livelihood diversification also play an important role in determining food security, children's dietary diversity,

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			and coping strategies in rural households. In conclusion, improved food safety and coping strategies can play an important role in improving child feeding practices and dietary diversity in rural communities.
9	Food Security and Stunting Incidences in the Coastal Areas of Indonesia (Yuliantini et al., 2022a)	**D:** Literature review **S:** Study from various publications on stunting and food security in coastal areas of Indonesia **V:** Stunting risk factors, food security, socio-economic status, maternal education, low birth weight **I:** Analysis of literature data from PubMed, ScienceDirect, ProQuest, Google Scholar **A:** Synthesis of literature results	Some studies show that one of the main causes of stunting in children is malnutrition during a prolonged growth period and is not noticed by parents until the child reaches the age of 2 years and is stunted. Based on the results of the literature review, the risk factors for stunting in coastal areas in coastal Indonesia include the risk of premature birth 16.43 times, the risk of mothers over 35 years of age 3.27 times, children born with low body weight 4.5 times, not getting ANC 3.4 times, not getting immunization 6.38 times, and not being given exclusive breastfeeding 4 times. In conclusion, consistent stunting risk factors are family socioeconomic status, maternal education, low birth weight, premature birth, exclusive non-breastfeeding, maternal age at childbirth, and macro and micronutrient deficiencies.
10	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 (Yazew, 2022)	**D:** Cross-sectional observational studies **Q:** Children aged 6–59 months in the Jima Geneti region, Ethiopia **V:** Risk factors for stunting and wasting, household food insecurity, socioeconomic status, frequency of meals, poor diet **I:** Anthropometric measurements, interviews, bivariate and multivariate logistic regression analysis using SPSS **A:** Identify risk factors for stunting and wasting related to food insecurity and family conditions	The prevalence of stunting and wasting was 27% and 11.8%, respectively. Significant risk factors for stunting include low socioeconomic status (AOR=2.5), low frequency of children's feeding (AOR=3.9), and poor diet (AOR=4.7). Risk factors for wasting include low socioeconomic status (AOR=2.75) and poor diet (AOR=2.65). The conclusion states that the prevalence of stunting and wasting is quite high and risk factors at the family level greatly affect the nutritional status of children.
11	Household food insecurity, dietary diversity, and stunting in sub-saharan africa (	**D:** A systematic review based on the recommendations of PRISMA (2015) on studies in Sub-Saharan Africa on household food insecurity, dietary diversity, and stunting.	Of the 21 articles that met the criteria, two-thirds showed a significant association between stunting and household food insecurity and dietary diversity. The study concludes that

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	Gassara & Chen, 2021a)	**Q:** Literature from 6 databases: PubMed, EMBASE, Science Direct, Web of Science, Google Scholar, and Scopus, published between 2009-2020. **V:** Household food insecurity, dietary diversity, and stunting in children in Sub-Saharan Africa. **I:** Systematic analysis of relevant articles (21 articles out of 2398 initial articles) for relationships between variables. **A:** Assess the relationship between food insecurity, dietary diversity, and stunting incidence.	food insecurity and dietary diversity are factors strongly associated with stunting in Sub-Saharan Africa. This study recommends the need for reliable guidelines and strategies to address these factors in order to eradicate child malnutrition in the region sustainably.
12	Seasonal Variation of Household Food Insecurity and Dietary Diversity on Wasting and Stunting among Children in A Draought Prone Area in South Ethiopia : A cohort Study (Belayneh et al., 2020a)	**D:** Longitudinal study for 1 year **S:** Children aged 6-47 months from households in Sidama **V:** Food security, dietary diversity, nutritional status (stunting, wasting) **I:** Food security survey and anthropometric measurements of children **A:** Longitudinal statistical analysis	Of the 3,449 observations in 897 households and 935 children aged 6 to 47 months, 82% (2,816) of households experienced food insecurity. Severe food security is higher in the pre-harvest season (March, the season of food scarcity) at 69%, compared to 50% in September. Of the 3,312 observations of children's nutritional status, 43% of children are stunted. Stunting shows seasonal variation, with a prevalence of 36% in March and increasing to 48% in December. The prevalence of wasting (thin children) is 6%, with a higher figure in March (8%) than in September (3%). Household characteristics such as poverty rates, education, employment, food security, and dietary diversity are related to the incidence of wasting and stunting of children.
13	Household Food Insecurity Predicts Childhood Undernutrition: A Cross-Sectional Study in West Oromia (Ethiopia) (Berra, 2020)	**D:** Cross-sectional study **S:** Children aged 6–23 months and households in West Oromia **V:** Household food security, child nutritional status (stunting, underweight, wasting) **I:** Household Food Insecurity Access Scale (HFIAS), child anthropometric measurements **A:** Multivariate logistic regression	Most households (69%) experienced food security, with 56.6% experiencing mild to moderate food security, and 12.4% severe. The prevalence of stunting in children is 41.8%, underweight 22%, and wasting 14.9%. Children from food-insecure households have a higher risk of stunting (OR: 2.09), underweight (OR: 4.73), and wasting (OR: 1.81) compared to children from food-safe households.

No	Research Title	Method (DSVIA)	Result
			Household food security is a significant predictor of child malnutrition in the region.
14	Relationship between household food insecurity and growth disorders in children aged 3 to 6 in Qazvin City, Iran (Gholampour et al., 2020)	**D** (Data/Subject): 177 children aged 3-6 years with growth disorders (cases) and 355 children without growth disorders (controls) in Qazvin, Iran. **S** (Setting): A health center in the city of Qazvin, Iran. **V** (Variable): Child growth disorders, household food insecurity, socioeconomic status, duration of breastfeeding, age of the child. **I** (Intervention/Method): A case-control study using an 18-item USDA questionnaire, a household socioeconomic questionnaire, and a growth monitoring card. **A** (Analysis): Statistical analysis with independent t-test, chi-square, and logistic regression using IBM SPSS 22.	A significant relationship was found between child growth disorders and household food insecurity, both accompanied by hunger (OR=17.0) and without hunger (OR=2.69) with $p<0.05$. Socioeconomic status was also significantly correlated with impaired growth (OR=3.4, $p<0.05$). Breastfeeding duration and child age were also significantly associated with growth disorders ($p<0.05$), while sex, birth order, and age of parents showed no significant relationship. In conclusion, low socioeconomic status and household food insecurity are important predictors of growth stunts in children. It is recommended for policymakers to improve job stability and family income and provide nutrition education to mothers so that children's nutritional needs can be met properly.
15	Child dietary diversity and food (in)security as a potential correlate of child anthropometric indices in the context of urban food system in the cases of north-central Ethiopia (Dinku et al., 2020a)	**D** *Community-based cross-sectional study* S : 512 mother-child pairs in the cities **of Dessie** and **Combolcha**, Ethiopia, children aged 6–59 months V : **Main variables (independent):** *Child dietary diversity*, *household food insecurity*, sociodemographic factors. **Dependent variables:** Child anthropometric index (Z-score of: weight-for-height, height-for-age, weight-for-age, BMI-for-age) I : Dietary diversity score and household food security status **A** Regression analysis to identify predictors of a child's anthropometric status	In the urban areas of northern Ethiopia, stunting and childhood obesity are both serious public health problems, indicating the dual burden of malnutrition. The diversity of children's diets had a significant relationship with the nutritional status of the child, whereas household food security showed no direct relationship. Multidisciplinary interventions that include maternal education, dietary improvement, and health sector strengthening are needed to address this nutrition problem comprehensively.
16	Stunting, food security, markets and food policy in Rwanda	**D:** A quantitative study with a logit model using household data in Rwanda	Stunting in children in rural areas of Rwanda was found to be multidimensionally related to the child's gender, weight, and age;

No	Research Title	Method (DSVIA)	Result
	(Weatherspoon et al., 2019)	**Q:** Rural children in Rwanda and socio-economic factors, food policies, and dietary diversity **V:** Stunting, dietary diversity, marital status and education of the head of the family, environmental factors, food production policy **I:** Logit model with cluster variance-covariance estimation based on village membership **A:** Analysis of the multidimensional relationship between stunting and socio-economic, environmental, and food policy factors in rural Rwanda	diversity of diet; marital status and education level of the head of the family; the height of the mother; the existence of a family or livestock garden; environmental factors such as soil height and fertility; as well as the location relative to the main road to the market. In addition, policies that support food production also play a role.
17	Household food insecurity, dietary diversity, stunting, and anaemia among left-behind children in poor rural areas of China (Yang et al., 2019)	**D:** An observational study in rural Hunan Province, China, on Left-behind children (LBC) aged 3-5 years. **Q:** Direct interviews with 553 LBC caregivers from 40 villages, **V:** Household food insecurity, dietary diversity, stunting, anemia. **I:** using the Household Food Insecurity Access Scale (HFIAS), dietary diversity score (DDS), food consumption frequency questionnaire, as well as hemoglobin and anthropometry measurements. **A:** Logistic regression analysis to assess the relationship between food insecurity and nutritional variables and nutritional status of children. Assess the prevalence of food insecurity and its impact on the nutritional status and dietary diversity of LBC children.	The prevalence of household food insecurity in LBC children in rural China is very high, at 67.6%. The prevalence of stunting and anemia was 16.6% and 26.5%, respectively. Food insecurity was positively associated with stunting (HFI weight: OR = 6.50; Moderate HFI: OR = 3.47) and anemia (severe HFI: OR = 1.91). LBC children who experienced food insecurity had significantly lower dietary diversity than those who were food insecure ($p < 0.001$). Nutrition intervention programs and policies are urgently needed to reduce food insecurity and nutritional problems in these vulnerable populations.
18	Determinants of household food insecurity and its association with child malnutrition in Sub-Saharan Africa (Drammeh et al., 2019a)	**D** Literature and studies related to household food insecurity and child malnutrition in Sub-Saharan Africa. **S** Sub-Saharan Africa region. **V** Determinants of household food insecurity and child malnutrition. **I** : A literature review (review article) that discusses the relationship between household food insecurity and child malnutrition. **A** : Synthesis and discussion of the results of previous studies related to the determinants of food insecurity and malnutrition.	Household food insecurity is a global public health challenge and is a major risk factor for malnutrition, causing an estimated 300,000 deaths each year. In Sub-Saharan Africa, food insecurity is responsible for more than half of child deaths, with an estimated 17 million individuals experiencing food insecurity in 2021. Malnutrition has an impact on decreased immunity, impaired physical and mental development, and decreased productivity in children under five years old and throughout life. This article emphasizes the importance of understanding the determinants of household food insecurity and their

No	Research Title	Method (DSVIA)	Result
			impact on child malnutrition in order for governments and policymakers to plan effective strategies to improve food security in Sub-Saharan Africa.
19	Food insecurity and the risk of undernutrition complications among children and adolescents (Moradi et al., 2019)	**D**: A study of 21 articles with a total of 55,173 children and adolescents from 12 different countries. **Q**: Children and adolescents from various countries, especially developing countries. **V**: Household food insecurity, risk of stunting, underweight, and wasting. **I**: A meta-analysis of studies related to the relationship between food insecurity and the nutritional status of children and adolescents. **A**: Analysis of pooled odds ratio (OR) and subgroups based on age and level of country development.	Household food insecurity increased the risk of stunting (OR = 1.17) and underweight (OR = 1.17) in children and adolescents, but did not have a significant effect on wasting (OR = 1.04). In children over 5 years old, the risk of stunting (OR = 1.20) and underweight (OR = 1.34) is more increased, while in children under 5 years old, only the risk of stunting increases (OR = 1.14). The risk of stunting and underweight also increases along with more severe levels of food insecurity. In addition, children and adolescents in developing countries have a higher risk of stunting (OR = 1.16). Economic development factors affect the impact of food insecurity on stunting risk.
20	Moderate and severe household food insecurity predicts stunting and severe stunting among Rwanda children aged 6-59 months residing in Gicumbi district (Agho et al., 2019)	**D :** Cross-sectional study **S :** 2,222 children aged 6–59 months in Gicumbi District, Rwanda **V :Key variables:** Household food security (HFI), stunting, severe stunting **Other variables:** Child gender, participation in monthly growth monitoring **I:** Household food security level (safe, lightweight, medium, heavy) **A :** Multiple logistic regression analysis with adjustments for clusters and sample weights	Moderate and severe household food security is significantly related to stunting and severe stunting in children aged 6–59 months. Interventions to reduce stunting should prioritize boys, regular growth monitoring, and increase household food security.
21	The influence of dietary diversity on the nutritional status of children between 6 and 23 months of age in Tanzania (Khamis et al., 2019a)	**D (Design):** Analysis of secondary data from *the Tanzania Demographic and Health Survey* 2015–2016 **S (Subjects):** 2,960 children aged 6–23 months in Tanzania **V (Variables): Main variables:** Stunting, wasting, underweight (based on Z-score HAZ, WHZ, WAZ) **Exposure variables:** *Minimum Dietary Diversity* (MDD, ≥4 out of 7 food groups). **Additional**	Adequate dietary diversity is associated with a reduced risk of stunting and underweight in children aged 6–23 months. Interventions to improve the quality and diversity of complementary foods of breast milk, including increased consumption of animal protein, are essential to prevent malnutrition in children in Tanzania.

No	Research Title	Method (DSVIA)	Result
		variables: Type of food consumed, sex of child **I (Intervention/Exposure):** The level of diversity of the child's daily diet **A (Analysis):** Bivariate and multivariate logistic regression to calculate *Adjusted Odds Ratio* (AOR)	
22	Food Insecurity, Health, and Development in Children Under Age Four Years (Drennen et al., 2019)	**D** : Cross-sectional survey study **S** : 284 children under 4 years old and their caregivers in 5 cities in the United States **V** : Status of household food insecurity, childhood obesity, underweight, stunting, child health, and child developmental risk **I** : Measurement of food insecurity using the Household Food Security Survey Module, as well as measurement of nutritional status and risk of child development **A** : Multivariable logistic regression with adjustment of confounders such as maternal BMI, participation in food assistance programs, and stratification of children's age	Of the 284 children, 50% were non-Hispanic African American, 34% Hispanic, 14% non-Hispanic white, and 27% lived in homes with food insecurity. No significant association was found between food insecurity and childhood obesity, underweight, or stunting. However, food insecurity is associated with an increased likelihood of children having poor health and a risk of poor development in different age groups. In conclusion, in children under 4 years of age, food insecurity is more associated with health and developmental risks than nutritional status (obesity, stunting, underweight).
23	Household food insecurity and undernutrition in children below 5 years living in different geographical areas in East Java, Indonesia (Sumarmi et al., 2018a)	**D:** Cross-sectional study **S:** 736 households with children <5 years old in four types of geographical areas of East Java **V:** Household food security, nutritional status of children (stunting, wasting, underweight), type of geographical area **I:** US-HFSSM, WHO Growth Standard 2006 **A:** Statistical analysis of differences in prevalence and relationship between variables	The prevalence of household food security differs significantly among different geographic areas. Almost half (44.8%) of households are categorized as "food insecure without hunge. The prevalence of "hunger" is highest in coastal areas (7.2%) and limestone (5.3%). The highest prevalence of stunting is in coastal areas (11.6%). The prevalence of wasting and underweight was highest in limestone areas (6.2% and 8.9%). The prevalence of undernutrition is relatively low in the municipality. There is a statistically significant relationship between the distribution of undernutrition and food security status with the type of geographical area. Conclusion: The prevalence of household food security and child

No	Research Title	Method (DSVIA)	Result
			undernutrition differs according to the type of geographical area in East Java. Food security and undernutrition are higher in coastal and limestone areas compared to agricultural and municipal areas.
24	Household Food Insecurity along an Agro-Ecological Gradient Influences Children's Nutritional Status in South Africa. Front. Nutr. (Chakona & Shackleton, 2018)	**D :** Cross-sectional study **S :** 554 women from random households in 3 cities in South Africa (rural–urban continuum). 216 children aged 2–5 years from the same household **V :** Household food security (*HFIAS),* Household dietary diversity (*HDDS),* Child nutritional status (height by age and upper arm circumference) Agroecological potential of the region **I:** 48-hour diet interview, HDDS and HFIAS scores. Anthropometric measurements (height and MUAC) **A :** Analysis of HDDS & HFIAS trends based on agroecological potential. Analysis of the relationship between HDDS, children's nutritional status, and food security	The agroecological potential of the region greatly affects the nutritional status of children in South Africa. Children from areas with low land potential are more prone to wasting and stunting. Food security, dietary diversity, and household socioeconomic conditions are inextricably linked. Efforts to combat malnutrition need to go beyond food security interventions, namely through sensitive and specific nutrition-based programs, with supportive environmental support such as land access and climate-smart agriculture, especially in dry areas
25	Household Food Insecurity as a Predictor of Stunted Children and Overweight/Obese Mothers (SCOWT) in Urban Indonesia (Mahmudiono et al., 2018a)	**D**: Cross-sectional survey study. **S** : 1. Urban households in Surabaya, Indonesia; 2. Children and mothers in the household. **V**: Household food insecurity, stunting in children, and overweight/obesity in mothers (SCOWT). **I** : The status of household food insecurity was measured using the Household Food Insecurity Access Scale (HFIAS). **A**: Multivariate logistic regression to correlate food insecurity categories with SCOWT risk.	The prevalence of child stunting in Surabaya is 36.4%, maternal overweight/obesity is 70.2%, and SCOWT is 24.7%. 42% of households are classified as food secure, while the rest experience various levels of food insecurity: mild (22.9%), moderate (15.3%), and severe (19.7%). Households with mild food insecurity had the highest odds ratio (aOR) for SCOWT (aOR = 2,789; 95% CI 1,540–5,083). The odds ratio for SCOWT was also significant in households with moderate (aOR = 2,530) and severe (aOR = 2,045) food insecurity. In conclusion, the dual burden of malnutrition (child stunting and

No	Research Title	Method (DSVIA)	Result
			maternal overweight/obesity) is associated with food insecurity, and HFIAS is a valid predictor for SCOWT.
26	Understanding the double burden of malnutrition in food insecure households in Brazil (Gubert et al., 2017a)	**D:** Analysis of secondary data from national surveys (Demographic and Health Survey Brazil 2006) **S :** 4,299 mothers (aged 15–49 years) and children under the age of 5 living in one household **V :**Maternal nutritional status (overweight), Child nutritional status (stunting), Household food security (HFI), Socio-economic and demographic variables at the household and macroeconomic levels **I :**Brazilian HFI Measurement Scale and Maternal Body Mass and Child Height Index **A :**Hierarchical multivariate logistic regression to test the relationship between **Double Burden of Malnutrition (DBM)** and **HFI,** adjusted for socio-demographic variables	This study shows that poor household food security is related to multiple malnutritions, namely maternal obesity and child stunting in one household. Interventions and policies that target increasing household food security can reduce the risk of child stunting and maternal obesity, as well as prevent costly long-term chronic diseases such as type 2 diabetes and cardiovascular disease.
27	Factors associated with stunting among children according to the level of food insecurity in the household: a cross-sectional study in a rural community of Southeastern Kenya (Shinsugi et al., 2015a)	**D:** Cohort-based cross-sectional study **S:** Children aged <5 years in rural communities of Southeast Kenya **V:** Stunting, household food security, demographic characteristics, socioeconomic status **I:** Structured questionnaire (HFIAS), anthropometric measurement **A:** Bivariate and multivariate logistic regression with food security stratification	The prevalence of stunting among 404 children was 23.3%, 62.5% of households experienced severe food insecurity. Multivariately, there was no significant association between overall household food security and child stunting. However, in the group of households with severe food security, there was a significant relationship between several factors and stunting, such as: Consumption of tea/porridge with milk (aOR: 3.22), Age of children 2-3 years compared to 0-5 months (aOR: 4.04), Owning livestock (aOR: 3.24) The lowest socioeconomic status is also correlated with stunting (aOR ranges from 0.13-0.22).

No	Research Title	Method (DSVIA)	Result
			The number of younger siblings had a marginal correlation in the heavy food security group (aOR: 2.81).
28	Household food insecurity, dietary diversity, stunting, and anaemia among left-behind children in poor rural areas of China (Drammeh et al., 2019b)	**D:** An observational study in rural Hunan Province, China, on Left-behind children (LBC) aged 3-5 years. **Q:** Direct interviews with 553 LBC caregivers from 40 villages, **V:** Household food insecurity, dietary diversity, stunting, anemia. **I:** using the Household Food Insecurity Access Scale (HFIAS), dietary diversity score (DDS), food consumption frequency questionnaire, as well as hemoglobin and anthropometry measurements. **A:** Logistic regression analysis to assess the relationship between food insecurity and nutritional variables and nutritional status of children. Assess the prevalence of food insecurity and its impact on the nutritional status and dietary diversity of LBC children.	The prevalence of household food insecurity in LBC children in rural China is very high, at 67.6%. The prevalence of stunting and anemia was 16.6% and 26.5%, respectively. Food insecurity was positively associated with stunting (HFI weight: OR = 6.50; Moderate HFI: OR = 3.47) and anemia (severe HFI: OR = 1.91). LBC children who experienced food insecurity had significantly lower dietary diversity than those who were food insecure ($p < 0.001$). Nutrition intervention programs and policies are urgently needed to reduce food insecurity and nutritional problems in these vulnerable populations.
29	Maternal nutrition counseling is associated with reduced stunting prevalence and improved feeding practices in early childhood: A post-program comparison study (Qar et al., 2013)	D: A quasi-experimental study with a two-stage cluster random sampling procedureS: 3009 mother-child pairs (1452 in the control group; the rest in the intervention group)V: Outcomes related to child nutrition (not specifically described, may include stunting or feeding practices) I:Control group: Essential Health Care (EHC) package only Intervention group: EHC package plus nutrition counsellingA: Chi-square test to compare results between Control and intervention groups	The results of this study prove that the prevalence of stunting in the intervention area is significantly lower than in the control area (29% vs 37%,)
30	Nutritional Interventions for Preventing Stunting in Children (Goudet et al., 2019a) (Goudet et al., 2019b)	**D:** Systematic review **S :** Toddler mother **V:** Types of nutritional interventions, child growth outcomes **I :** Various specific nutritional interventions **A:** Evaluation of the effectiveness of the intervention	This systematic review evaluated a range of studies of nutritional interventions to prevent stunting. The results suggest that nutritional interventions have the potential to reduce stunting, although evidence of effectiveness varies. This study emphasizes the need for a more integrated and evidence-based approach in designing nutrition interventions for children.
31	Child's Gender and Household Food Insecurity Are Associated with Stunting	**D:** Cross-sectional studies **S :** Toddler mother **V:** Child's gender, household food security, nutritional status	In this cross-sectional study, data from households in Latin America were analyzed to identify factors related to stunting. The results showed that girls and households

No	Research Title	Method (DSVIA)	Result
	(Baig-Ansari et al., 2006)	**I :** Child Gender and Household Food Security **A:** Statistical analysis	with low food security had a higher risk of stunting. These findings highlight the need for special attention to gender and food security in efforts to tackle stunting.
32	Socio-Demographic of Family Food Security in Relation to the Incidence of Stunting in Children Aged 1-5 Years‖. (Laode Wado et al., 2019a)	D This study uses a descriptive design with a case- control study that combines quantitative and qualitative methods. Quantitative data was collected through questionnaires, while qualitative data was obtained from semi-structured interviews limited to in-depth exploration. S Population: Parents of children aged 1–5 years. V Independent variables: Factors potentially related to stunting, such as nutritional knowledge, children's diet, breastfeeding practices, sanitation conditions, and income family. Dependent variable: Stunting status in children aged 1–5 years. I Structured questionnaire given to parents to Collect data on parenting, food consumption, and environmental factors. Semi-structured interviews with a small percentage of respondents to obtain qualitative data exploratory related to the factors that affect stunting. A Spearman correlation analysis was used to evaluate the relationship between independent variables and stunting status.	The results of the study explained that families who are vulnerable and food insecure have toddlers who experience stunting and normal toddlers. This condition depends on and can be influenced by the education and knowledge of the foster parents, the parenting style of the parents, the number of family members, and the income and expenses of their household needs coupled with nutritious food intake for IICRI. Food security has a real relationship and is related to the nutritional status of toddlers and the incidence of stunting experienced in toddlers. Families who have enough food in quantity and quality make the nutritional nutrients of toddlers sufficient.
33	The Relationship between Family Food Security and Diarrhea Frequency with Stunting in Toddlers in Surabaya Village (Musyayadah & Adiningsih, 2019a)	D This study is an observational analytical study with a cross-sectional design aimed at Examining the relationship between household food security and nutritional status of toddlers. S Population: All toddlers aged 6–24 in the work area of the Bulak Health Center, Surabaya, as many as 291 toddlers. Sample: Taken using a simple random sampling technique with the inclusion criteria of toddlers aged 6–24 months who are domiciled in Surabaya and the exclusion of toddlers with congenital disabilities. V Independent variable: Household food security, measured by	The majority of household food security conditions in this study sample were in non-food resistant conditions (71.1%) consisting of 3 treatment distribution groups. The majority group is households with food insecurity without hunger (48.1%), the next group is food-insecure households with moderate and severe degrees of hunger (11.5%) (Musyayadah and Adiningsih, 2019). In this study, 28.9% of households in food insecurity conditions. The results of the analysis showed that there was a relationship between family food security and stunting. The results of the study explained that there is a relationship between food insecurity without hunger and the incidence of stunting (p=0.038).

No	Research Title	Method (DSVIA)	Result
		scores from the US Household questionnaire Food Security Survey Module (US HFSSM). Dependent variables: The nutritional status of the toddler (e.g. stunting, wasting, or underweight), or other nutritional variables according to the purpose of the study. I Structured interviews using US HFSSM instruments to measuring household food security. Collection of demographic data and characteristics of toddlers through a special fill sheet or KIA (Child Identity Card). A Analysis of the relationship between household food security and nutritional status of toddlers using the Spearman correlation test.	Toddlers in food-insecure conditions are at 10.9 times greater risk of experiencing stunting at their age (Musyayadah and Adiningsih, 2019). This means that there are still many food-insecure households. This can be seen from the feeding pattern of households that are in a food-insecure condition, namely trying to avoid hunger by reducing the portion of food family members from what should be needed.
34	The Relationship of Socioeconomic Factors and Food Security to the Incidence of Stunting in Toddlers (Wardani et al., 2020a)	D This study is an observational analysis with a case-control design carried out in Teluk Betung District, Bandar Lampung City. S Population: Toddlers aged 12–59 months as many as 1,633 people, consisting of:Samples: Taken by random sampling, each: 50 toddlers case and 50 control toddlers V Independent variables: Household food security level, Dependent variables: Nutritional status of toddlers (cases = malnutrition/stunting; control = normal nutrition) I Household Food Questionnaire The Insecurity Access Scale (HFIAS) is used to measure household access to food in four categories. Nutritional status data of toddlers was obtained from direct anthropometric measurements or data available at the local health center. A The analysis used the Chi-square test or logistic regression to test the relationship between the level of food security and the nutritional status of the toddler.	The results of this study found that stunted toddlers are more in the environment of food-insecure families, the results of the study show that there are families with severe (75.0%) and moderately prone (83.3%) categories and food diversity tends to be in the low-medium category of 80%. This is inversely proportional to the fact that more non-stunting toddlers (72.3%) are in food-resistant households with a high indicator of family food diversity of 53.3%. The results of the study showed that there is a related and positive relationship between socioeconomic variables such as income, expenditure, parental education and food security which includes aspects of food insecurity in the household sector. with stunting in toddlers.
35	The Relationship between Family Food Security and Nutrient Adequacy Levels with Stunting Incidence in Children Aged 24-59 Months in Coastal Areas	D : This study is an explanatory research with an analytical survey method and uses a cross-sectional design. S :P Opulation: All mothers who have toddlers aged 24–59 months. Sample: A total of 86 respondents, selected by purposive sampling and sample size determined using the Lemeshow formula.	This study shows that there is a relationship between energy and protein adequacy levels and stunting at the age of toddlers 24-59 months. Most of the children under five whose nutritional adequacy levels are classified as good (87%) and (100%) have normal TB/U nutritional status.

No	Research Title	Method (DSVIA)	Result
	(Al Faiqoh et al., 2018a)	V :Independent variables: Food consumption patterns (based on Food Frequency Questionnaire/FFQ and 24-hour recall) Dependent variables: Nutritional status or nutritional health indicators of toddlers (e.g. weight by age, height by age, according to the purpose of the study) I:Food Frequency Questionnaire (FFQ) A:The Pearson correlation test is used for normally distributed data.	
36	Household Food Insecurity and Its Association with Nutritional Status of Children 6–59 Months of Age in East Badawacho District, South Ethiopia (Betebo et al., 2017)	**D:** Community-based cross-sectional study **S :** 508 mother-child pairs (children aged 6–59 months) in East Badawacho District, Ethiopia **V: Main variables:** Household food security, child nutritional status (stunting, underweight, wasting). **Other variables:** Sociodemographic factors of mothers and households **I :** Household food security (measured and categorized) **A (Analysis):** Bivariate and multivariate analysis (regression logistics), with a p< value of 0.05 as statistically significant	Household food insecurity significantly increases the risk of stunting and underweight, but does not have a significant effect on wasting.
37	The Relationship between Family Food Security and Nutritional Status of Toddlers (Study in Palasari Village and Legok District Health Center, Tangerang Regency) (Arlius et al., 2017)	D.: Cross sectional S : The population in this study is parents/mothers/fathers and toddlers aged 0-59 months who suffer from malnutrition and malnutrition (under normal conditions). V: Food security and nutritional status I : Food security and nutritional status questionnaires A: Chi Square	The results of the study showed that: (1) Some respondents were in the food insecure category, around 36%, in the food vulnerable category around 39% and in the food resistant category only about 15% and the food insecurity category around 10%. (2) The nutrition improvement program for the community or toddlers of the Legok Health Center is carried out daily, monthly and yearly, the daily program is: Increase in exclusive breastfeeding without additional food and drinks for babies up to 6 months of age. The monthly program is monitoring the weight development of toddlers (Toddler body weighing), which is weighing the weight measurement of toddlers to find out the growth patterns and development of the toddler's body and its development. The annual program is Monitoring the nutritional status of toddlers and monitoring nutritional intake. Food security and nutritional status of toddlers are closely

No	Research Title	Method (DSVIA)	Result
			related, if the family has enough food security, it will affect their nutritional status to be good, on the other hand, if the food is lacking, then their nutritional status is likely to experience malnutrition and lack

Based on a review of 37 journals that discuss the optimization of food security and stunting, it can be concluded that household food security has a crucial role as a determinant of children's nutritional status, especially in preventing stunting in children under five. Almost all studies reported a significant relationship between the level of food insecurity and the prevalence of stunting. The magnitude of this relationship varies, ranging from an increased risk of 1.2 times to more than 6 times in households with moderate to severe food insecurity compared to food-safe households.

3. Discussion

The results of a literature review from 37 journals show a consistent pattern of findings that food security insecurity, characterized by low dietary diversity and inadequate feeding frequency, is a direct pathway to stunting in children. This condition generally occurs in households with limited access to nutritious food, forcing them to replace animal protein and micronutrient sources with cheap foods high in carbohydrates and fats but poor in nutrients. As a result, children experience chronic malnutrition that inhibits linear growth. The maternal education factor has also been repeatedly identified as an important determinant, where low levels of education have implications for limited nutritional knowledge, access to health information, and the ability to utilize nutritional services. Other factors such as family income, household size, and job status of heads of households also strengthen the relationship between food insecurity and stunting, making this problem multidimensional and requires a cross-sectoral intervention approach.

1. Consistent Finding Patterns

The majority of studies show that low dietary diversity and inadequate eating frequency are direct pathways from food insecurity to stunting. Households with limited access to nutritious foods tend to replace foods rich in animal protein and micronutrients with inexpensive energy sources that are high in carbohydrates and fats but poor in nutrients. As a result, children experience chronic malnutrition that impacts linear growth. (Dinku et al., 2020b.

In addition, the mother's education factor repeatedly appears as an important determinant. Mothers with low education tend to have limited nutritional knowledge, are less exposed to health information, and find it more difficult to access nutrition and health services. Family income factors, household size, and job status of the head of the family also greatly affect the ability of households to meet children's food needs. (Elolu et al., 2023b; Gassara & Chen, 2021b; Laode Wado et al., 2019b; Mulatu et al., 2025b; Oliveira et al., 2024b; Wardani et al., 2020b; Yuliantini et al., 2022b).

2. Differences in Findings Between Regions

In rural areas, food insecurity is often triggered by limited food production, reliance on seasonal agricultural products, and weak distribution infrastructure. Studies in coastal areas and areas with limestone soils show higher stunting rates than fertile agricultural areas, due to more limited access to food (Al Faiqoh et al., 2018b; Sumarmi et al., 2018b; Yuliantini et al., 2022b).

Conversely, in urban areas, although food availability is relatively better, purchasing power is a major problem. This causes the phenomenon of double burden of malnutrition where in one household, children are stunted while mothers are overweight or obese. The cause is the consumption of cheap and fast food that is high in energy but poor in nutrients (Gubert et al., 2017b; Mahmudiono et al., 2018b).

3. Dominant Factors and Causal Pathways

In general, the pathways that link food insecurity and stunting can be explained through three main mechanisms:

a. Limited economic access → reduced quantity and quality of food → chronic nutritional deficits → stunted growth (Dinku et al., 2020b; Elolu et al., 2023b; Gassara et al., 2023b; Khamis et al., 2019b; Shinsugi et al., 2015b; Wardani et al., 2020b).
b. An unhealthy environment → an increased incidence of infectious diseases such as diarrhea → malabsorption of nutrients → fail to grow (Dinku et al., 2020b; Elolu et al., 2023b; Gassara et al., 2023b; Khamis et al., 2019b; Stuttgart & Squirt, 2019b; Shinsugi et al., 2015b).
c. Low nutrition knowledge and parenting practices → improper feeding of MP-ASI → not meeting nutritional needs for 1,000 HPK (Elolu et al., 2023b; Gassara & Chen, 2021b; Laode Wado et al., 2019b; Mulatu et al., 2025b; Oliveira et al., 2024b; Wardani et al., 2020b; Yuliantini et al., 2022b).

Famine seasons and natural disasters are additional factors that disrupt food stability, exacerbating the vulnerability of poor families. Several studies show a significant increase in the prevalence of stunting in the pre-harvest period, which indicates the need for seasonal risk mitigation strategies. (Belayneh et al., 2020b)

4. Implications for Stunting Prevention

These findings confirm that stunting prevention requires interventions that strengthen the four pillars of food security: FAO

a. Availability: increasing local food production, strengthening community food reserves, and diversifying food.
b. Access: conditional social assistance programs and economic empowerment of poor families to increase purchasing power.
c. Utilization: family nutrition education, promotion of exclusive breastfeeding, and feeding of MP-ASI rich in animal protein.
d. Stability: food crisis early warning systems, livelihood diversification, and mitigation of seasonal impacts.

In addition, the integration of specific nutritional interventions (such as micronutrient supplementation and food fortification) with sensitive interventions (such as improved sanitation, clean water, and education) has been shown to be more effective in reducing the prevalence of stunting than a single approach.

From a policy perspective, food security should not only be measured by the availability of food nationally, but must ensure equitable access at the household level. Stunting prevention programs need to prioritize households with severe food insecurity and children under the age of two, as well as pay attention to differences in regional contexts. A multisectoral approach involving the health, agriculture, education, and social protection sectors is key to success. The success of the program in a number of studies also shows the importance of the role of health cadres, community leaders, and community social support in building healthy nutritional behaviors.

FAO (2019) defines food security as a condition in which everyone, at all times, has physical, social, and economic access to sufficient, safe, and nutritious food. The four pillars of food security—availability, access, utilization, and stability—are interrelated foundations. If one of the pillars is disrupted, the risk of malnutrition, including stunting, increases significantly. Research by Leroy et al. (2020) in 49 low- and middle-income countries showed that food-safe households had an 11 percentage point lower stunting prevalence than food-insecure households, after controlling for other socioeconomic factors. FAO

The results of this review are consistent with the study of Shinsugi et al. (2019) in Nepal which found that food insecurity is associated with low dietary diversity score (DDS) and animal protein intake, which in turn increases the risk of stunting. Food insecurity also increases susceptibility to infectious diseases such as diarrhea, ISPA, and worms, which leads to malabsorption of nutrients (Humphrey et al., 2019). Biologically, a lack of essential nutrients such as protein, zinc, and vitamin A in the period of 1,000 HPK will inhibit cell proliferation and the development of long bones, which is characteristic of stunting (Dinku et al., 2020b; Elolu et al., 2023b; Gassara et al., 2023b; Khamis et al., 2019b; Stuttgart & Squirt, 2019b; Shinsugi et al., 2015b).

Some studies support the finding that rural areas have higher vulnerability due to limited infrastructure, reliance on seasonal food production, and vulnerability to price fluctuations. On the other hand, studies in urban areas in Kenya and Indonesia show the phenomenon of double burden of malnutrition, where limited purchasing power triggers the consumption of ultra-processed foods that are high in calories but poor in nutrients, resulting in children being stunting while other family members are obese (Headey et al., 2019; Gubert et al., 2017b; Mahmudiono et al., 2018b).

The results of 37 journals emphasize the need for multisectoral interventions. This is in line with evidence from the Scaling Up Nutrition Movement (SUN, 2021) which shows that the integration of specific nutritional interventions (e.g. micronutrient supplementation, promotion of exclusive breastfeeding) with sensitive interventions (such as sanitation improvement, nutrition education, and economic empowerment) can reduce the prevalence of stunting by up to 40% within 5–10 years. A study in Bangladesh proved that a combination program of conditional cash transfers, nutrition education, and increased household food production was able to increase the family's food diversity score and reduce the prevalence of stunting by 7% in 3 years (Islam et al., 2018).

A number of international studies also confirm that maternal education is a significant protective factor against stunting. Research in Ethiopia found that mothers with at least secondary education had a 30% lower risk of stunted children than mothers who did not attend school. Maternal education affects how to manage food, choose nutritious foodstuffs, and provide proper parenting, including the provision of MP-ASI according to WHO recommendations. Based on these findings, stunting prevention strategies must go beyond the health sector approach alone. National food policy needs to ensure that food security is measured at the household level, not just on national food availability. In addition, interventions must be tailored to the local context, for example, in famine-prone areas, there needs to be community food reserves and early warning systems, while in urban areas, there needs to be regulation of ultra-processed foods and healthy food subsidy programs for low-income families.

4. Conclusion

Based on a review of 37 journals, household food security is proven to be a key factor in preventing stunting in toddlers. Food insecurity, especially those that cause low dietary diversity and quality of nutritional intake, contribute significantly to the occurrence of stunting. Factors such as maternal education, family income, and access to health services also strengthen this relationship. In rural areas, stunting is triggered by limited food production and distribution, while in urban areas, low purchasing power encourages the consumption of high-calorie but nutrient-poor foods, creating the phenomenon of double nutritional burden.

Stunting prevention strategies must include strengthening the four pillars of food security: availability, access, utilization, and stability. The most effective interventions are multisectoral approaches that combine specific nutrition interventions (such as breastfeeding promotion, supplementation) and sensitive interventions (such as nutrition education, sanitation, and social protection). Food security needs to be measured down to the household level, with priority given to the most vulnerable groups such as poor families and children under the age of two.

References

Abdullah, A., Emery, C., Xu, Y., & Mensah, F. (2025a). Associations between child neglect, informal interventions in food neglect, and child stunting: Evidence from the Ghana families study. *Children and Youth Services Review*, *172*, 108273. https://doi.org/10.1016/J.CHILDYOUTH.2025.108273

Abdullah, A., Emery, C., Xu, Y., & Mensah, F. (2025b). Associations between child neglect, informal interventions in food neglect, and child stunting: Evidence from the Ghana families study. *Children and Youth Services Review*, *172*, 108273. https://doi.org/10.1016/J.CHILDYOUTH.2025.108273

Agho, K. E., Mukabutera, C., Mukazi, M., Ntambara, M., Mbugua, I., Dowling, M., & Kamara, J. K. (2019). Moderate and severe household food insecurity predicts stunting and severe stunting among Rwanda children aged 6–59 months residing in Gicumbi district. *Maternal & Child Nutrition*, *15*(3). https://doi.org/10.1111/mcn.12767

Al Faiqoh, R. B., Suyatno, S., & Kartini, A. (2018a). The Relationship Between Family Food Insecurity And Nutrient Adequacy Level With The Incidence Of Stunting In Children Aged 24-59 Months In Coastal Areas (Study in the Working Area of the Bandarharjo Health Center, Semarang City). *Journal of Public Health; Vol 6, No 5 (2018): SEPTEMBER - 10.14710/Jkm.V6i5.22065*.

Al Faiqoh, R. B., Suyatno, S., & Kartini, A. (2018b). The Relationship Between Family Food Insecurity And Nutrient Adequacy Level With The Incidence Of Stunting In Children Aged 24-59 Months In Coastal Areas (Study in the Working Area of the Bandarharjo Health Center, Semarang City). *Journal of Public Health; Vol 6, No 5 (2018): SEPTEMBER - 10.14710/Jkm.V6i5.22065*. https://ejournal3.undip.ac.id/index.php/jkm/article/view/22065

Anaqreh, A. H., Hamad, H. J., Al-Dabbas, M. M., Sundookah, A., Alhalaiqa, F., Al-Jaloudi, R., Al-Ma'ani, M. A., & Al-Tarawneh, R. A. (2025a). Household food insecurity and nutritional status of pre-school children following relaxation of corona virus disease-2019 (COVID-19) restrictions. *Clinical Nutrition ESPEN, 66*, 255–261. https://doi.org/10.1016/j.clnesp.2025.01.058

Anaqreh, A. H., Hamad, H. J., Al-Dabbas, M. M., Sundookah, A., Alhalaiqa, F., Al-Jaloudi, R., Al-Ma'ani, M. A., & Al-Tarawneh, R. A. (2025b). Household food insecurity and nutritional status of pre-school children following relaxation of corona virus disease-2019 (COVID-19) restrictions. *Clinical Nutrition ESPEN, 66*, 255–261. https://doi.org/10.1016/j.clnesp.2025.01.058

Arlius, A., Sudargo, T., & Subejo, S. (2017). The Relationship between Family Food Security and Nutritional Status of Toddlers (Study in Palasari Village and Legok District Health Center, Tangerang Regency). *Journal of National Resilience*, *23*(3), 359. https://doi.org/10.22146/jkn.25500

Baig-Ansari, N., Rahbar, M. H., Bhutta, Z. A., & Badruddin, S. H. (2006). Child's gender and household food insecurity are associated with stunting among young Pakistani children residing in urban squatter settlements. *Food and Nutrition Bulletin*, *27*(2), 114–127. https://doi.org/10.1177/156482650602700203

Belayneh, M., Loha, E., & Lindtjørn, B. (2020a). 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*, 1–26. https://doi.org/10.1080/03670244.2020.1789865

Belayneh, M., Loha, E., & Lindtjørn, B. (2020b). 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*, 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

Betebo, B., Ejajo, T., Alemseged, F., & Massa, D. (2017). Household Food Insecurity and Its Association with Nutritional Status of Children 6-59 Months of Age in East Badawacho District, South Ethiopia. *Journal of Environmental and Public Health*, *2017*. https://doi.org/10.1155/2017/6373595

Boliko, M. C. (2019). FAO and the situation of food security and nutrition in the world. *Journal of Nutritional Science and Vitaminology*, *65*, S4–S8. https://doi.org/10.3177/jnsv.65.S4

Chakona, G., & Shackleton, C. M. (2018). Household Food Insecurity along an Agro-Ecological Gradient Influences Children's Nutritional Status in South Africa. *Frontiers in Nutrition*, *4*. https://doi.org/10.3389/fnut.2017.00072

Dinku, A. M., Mekonnen, T. C., & Adilu, G. S. (2020a). Child dietary diversity and food (in)security as a potential correlate of child anthropometric indices in the context of urban food system in the cases of north-central Ethiopia. *Journal of Health, Population and Nutrition*, *39*(1). https://doi.org/10.1186/s41043-020-00219-6

Dinku, A. M., Mekonnen, T. C., & Adilu, G. S. (2020b). Child dietary diversity and food (in)security as a potential correlate of child anthropometric indices in the context of urban

food system in the cases of north-central Ethiopia. *Journal of Health, Population and Nutrition*, *39*(1). https://doi.org/10.1186/s41043-020-00219-6

Drammeh, W., Hamid, N. A., & Rohana, A. J. (2019a). Determinants of household food insecurity and its association with child malnutrition in Sub-Saharan Africa: A review of the literature. *Current Research in Nutrition and Food Science*, *7*(3), 610–623. https://doi.org/10.12944/CRNFSJ.7.3.02

Drammeh, W., Hamid, N. A., & Rohana, A. J. (2019b). Determinants of Household Food Insecurity and Its Association with Child Malnutrition in Sub-Saharan Africa: A Review of the Literature. *Current Research in Nutrition and Food Science Journal*, *7*(3), 610–623. https://doi.org/10.12944/CRNFSJ.7.3.02

Drennen, C. R., Coleman, S. M., Ettinger de Cuba, S., Frank, D. A., Chilton, M., Cook, J. T., Cutts, D. B., Heeren, T., Casey, P. H., & Black, M. M. (2019). *Food Insecurity, Health, and Development in Children Under Age Four Years*. https://doi.org/10.1542/2019-2430

Elolu, S., Agako, A., & Okello, D. M. (2023a). Household food security, child dietary diversity and coping strategies among rural households. The case of Kole District in northern Uganda. *Dialogues in Health*, *3*(July), 100149. https://doi.org/10.1016/j.dialog.2023.100149

Elolu, S., Agako, A., & Okello, D. M. (2023b). Household food security, child dietary diversity and coping strategies among rural households. The case of Kole District in northern Uganda. *Dialogues in Health*, *3*(July), 100149. https://doi.org/10.1016/j.dialog.2023.100149

Gassara, G., & Chen, J. (2021a). Household food insecurity, dietary diversity, and stunting in sub-saharan Africa: A systematic review. *Nutrients*, *13*(12). https://doi.org/10.3390/nu13124401

Gassara, G., & Chen, J. (2021b). Household food insecurity, dietary diversity, and stunting in sub-saharan Africa: A systematic review. *Nutrients*, *13*(12). https://doi.org/10.3390/nu13124401

Gassara, G., Lin, Q., Deng, J., Zhang, Y., Wei, J., & Chen, J. (2023a). Dietary Diversity, Household Food Insecurity and Stunting among Children Aged 12 to 59 Months in N'Djamena—Chad. *Nutrients*, *15*(3). https://doi.org/10.3390/nu15030573

Gassara, G., Lin, Q., Deng, J., Zhang, Y., Wei, J., & Chen, J. (2023b). Dietary Diversity, Household Food Insecurity and Stunting among Children Aged 12 to 59 Months in N'Djamena—Chad. *Nutrients*, *15*(3), 573. https://doi.org/10.3390/nu15030573

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

Goudet, S. M., Bogin, B. A., Madise, N. J., & Griffiths, P. L. (2019a). Nutritional interventions for preventing stunting in children (Birth to 59 months) living in urban slums in low- and middle-income countries (LMIC). *Cochrane Database of Systematic Reviews*, *2019*(6). https://doi.org/10.1002/14651858.CD011695.pub2

Goudet, S. M., Bogin, B. A., Madise, N. J., & Griffiths, P. L. (2019b). Nutritional interventions for preventing stunting in children (Birth to 59 months) living in urban slums in low- and middle-income countries (LMIC). *Cochrane Database of Systematic Reviews*, *2019*(6). https://doi.org/10.1002/14651858.CD011695.pub2

Gubert, M. B., Spaniol, A. M., Segall-Corrêa, A. M., & Pérez-Escamilla, R. (2017a). Understanding the double burden of malnutrition in food insecure households in Brazil. *Maternal & Child Nutrition*, *13*(3). https://doi.org/10.1111/mcn.12347

Gubert, M. B., Spaniol, A. M., Segall-Corrêa, A. M., & Pérez-Escamilla, R. (2017b). Understanding the double burden of malnutrition in food insecure households in Brazil. *Maternal & Child Nutrition*, *13*(3). https://doi.org/10.1111/mcn.12347

Haddad, L. , H. C. , W. J. , W. P. , G. H. C. J. , & T. C. (2015). *Food policy: Looking forward. Food Security, 7(3), 491–504.*

Harper, A., Rothberg, A., Chirwa, E., Sambu, W., & Mall, S. (2023). Household Food Insecurity and Demographic Factors, Low Birth Weight and Stunting in Early Childhood: Findings from a Longitudinal Study in South Africa. *Maternal and Child Health Journal*, *27*(1), 59–69. https://doi.org/10.1007/s10995-022-03555-7

Headey, D., Hirvonen, K., Hoddinott, J., & Stifel, D. (2019). Rural Food Markets and Child Nutrition. *American Journal of Agricultural Economics*, *101*(5), 1311–1327. https://doi.org/10.1093/ajae/aaz032

Islam, M. M., Sanin, K. I., Mahfuz, M., Ahmed, A. M. S., Mondal, D., Haque, R., & Ahmed, T. (2018). Risk factors of stunting among children living in an urban slum of Bangladesh: Findings of a prospective cohort study. *BMC Public Health*, *18*(1), 1–13. https://doi.org/10.1186/s12889-018-5101-x

Khamis, A. G., Mwanri, A. W., Ntwenya, J. E., & Kreppel, K. (2019a). The influence of dietary diversity on the nutritional status of children between 6 and 23 months of age in Tanzania. *BMC Pediatrics*, *19*(1). https://doi.org/10.1186/s12887-019-1897-5

Khamis, A. G., Mwanri, A. W., Ntwenya, J. E., & Kreppel, K. (2019b). The influence of dietary diversity on the nutritional status of children between 6 and 23 months of age in Tanzania. *BMC Pediatrics*, *19*(1). https://doi.org/10.1186/s12887-019-1897-5

Cook, M. W., Callery, P., & Fallon, D. (2021). Factors impacting on childhood nutrition: The experience of mothers in a rural Ghanaian community. *Appetite*, *167*(March), 105617. https://doi.org/10.1016/j.appet.2021.105617

Kusumajaya, D. K. , S. O. , & Y. D. (2022). (2015). The relationship between household food security and the incidence of stunting in toddlers in rural areas. . *Journal of Nutrition and Health, 14(1), 45–52.*

Laode Wado, L. A., Sudargo, T., & Armawi, A. (2019a). Socio-Demographic of Family Food Security in Relation to the Incidence of Stunting in Children Aged 1-5 Years (Study in the Working Area of the Bandarharjo Health Center, Tanjung Mas Village, North Semarang District, Semarang Municipality, Central Java Province). *Journal of National Resilience*, *25*(2), 178. https://doi.org/10.22146/jkn.45707

Laode Wado, L. A., Sudargo, T., & Armawi, A. (2019b). Socio-Demographic of Family Food Security in Relation to the Incidence of Stunting in Children Aged 1-5 Years (Study in the Working Area of the Bandarharjo Health Center, Tanjung Mas Village, North Semarang District, Semarang Municipality, Central Java Province). *Journal of National Resilience*, *25*(2), 178. https://doi.org/10.22146/jkn.45707

Leroy, J. L., Olney, D., & Ruel, M. (2018). Tubaramure, a food-assisted integrated health and nutrition program, reduces child stunting in Burundi: A cluster-randomized controlled intervention trial. *Journal of Nutrition*, *148*(3), 445–452. https://doi.org/10.1093/jn/nxx063

Mahmudiono, T., Susila Nindya, T., Ririn Andrias, D., Megatsari, H., & Rosenkranz, R. R. (2018a). *Household Food Insecurity as a Predictor of Stunted Children and Overweight/Obese Mothers (SCOWT) in Urban Indonesia*. https://doi.org/10.3390/nu10050535

Mahmudiono, T., Susila Nindya, T., Ririn Andrias, D., Megatsari, H., & Rosenkranz, R. R. (2018b). *Household Food Insecurity as a Predictor of Stunted Children and Overweight/Obese Mothers (SCOWT) in Urban Indonesia*. https://doi.org/10.3390/nu10050535

Miranda, A. V., Sirmareza, T., Nugraha, R. R., Rastuti, M., Syahidi, H., Asmara, R., & Petersen, Z. (2023). Towards stunting eradication in Indonesia: Time to invest in community health workers. *Public Health Challenges*, *2*(3), 1–6. https://doi.org/10.1002/puh2.108

Moradi, S., Mirzababaei, A., Mohammadi, H., Moosavian, S. P., Arab, A., Jannat, B., & Mirzaei, K. (2019). Food insecurity and the risk of undernutrition complications among children and adolescents: A systematic review and meta-analysis. *Nutrition*, *62*, 52–60. https://doi.org/10.1016/J.NUT.2018.11.029

Mulatu, S., Gedif, A., Tadesse, F., Zemene, W., Berhanu, M., & Workie, H. M. (2025a). A high prevalence of stunting was observed among under-five children: A community-based cross-sectional study. *Clinical Nutrition ESPEN, 66*, 343–351. https://doi.org/10.1016/j.clnesp.2025.01.060

Mulatu, S., Gedif, A., Tadesse, F., Zemene, W., Berhanu, M., & Workie, H. M. (2025b). A high prevalence of stunting was observed among under-five children: A community-based cross-sectional study. *Clinical Nutrition ESPEN, 66*, 343–351. https://doi.org/10.1016/j.clnesp.2025.01.060

Musyayadah, M., & Adiningsih, S. (2019a). The Relationship between Family Food Security and Frequency of Diarrhea and Stunting in Toddlers in Surabaya Village. *Amerta Nutrition*, *3*(4), 257. https://doi.org/10.20473/amnt.v3i4.2019.257-262

Musyayadah, M., & Adiningsih, S. (2019b). The Relationship between Family Food Security and Frequency of Diarrhea and Stunting in Toddlers in Surabaya Village. *Amerta Nutrition*, *3*(4), 257. https://doi.org/10.20473/amnt.v3i4.2019.257-262

Oliveira, J. S., Pequeno, N., Barbosa, N., Aquino, D., & Kiefte-De Jong, J. C. (2024a). *The role of parental child marriage in children's food security and nutritional status: a prospective cohort study in Indonesia*. https://doi.org/10.3389/fpubh.2024.1469483

Oliveira, J. S., Pequeno, N., Barbosa, N., Aquino, D., & Kiefte-De Jong, J. C. (2024b). *The role of parental child marriage in children's food security and nutritional status: a prospective cohort study in Indonesia*. https://doi.org/10.3389/fpubh.2024.1469483

Organization, W. H., & Fund, U. N. C. (2020). *Levels and trends in child malnutrition: key findings of the 2020 edition. UNICEF/WHO/World Bank Group joint child malnutrition estimates*. World Health Organization.

Qar, Z., Bhutta, A., Das, J. K., Rizvi, A., Gaff, M. F., Walker, N., Horton, S., Webb, P., Lartey, A., & Black, R. E. (2013). Maternal and Child Nutrition 2 Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? The Lancet Nutrition Interventions Review Group, and the Maternal and Child Nutrition Study Group. *Www.Thelancet.Com*, *382*. https://doi.org/10.1016/S0140-6736(13)60996-4

Santa-Ramírez, H. A., Otálvaro-Castro, G. J., Joost, S., Melgar-Quiñonez, H., Bilal, U., & Stringhini, S. (2023). Small area vulnerability, household food insecurity and child malnutrition in Medellin, Colombia: results from a repeated cross-sectional study. *The Lancet Regional Health - Americas*, *23*, 100521. https://doi.org/10.1016/j.lana.2023.100521

Shinsugi, C., Matsumura, M., Karama, M., Tanaka, J., Changoma, M., & Kaneko, S. (2015a). *Factors associated with stunting among children according to the level of food insecurity in the household: a cross-sectional study in a rural community of Southeastern Kenya*. https://doi.org/10.1186/s12889-015-1802-6

Shinsugi, C., Matsumura, M., Karama, M., Tanaka, J., Changoma, M., & Kaneko, S. (2015b). *Factors associated with stunting among children according to the level of food insecurity in the household: a cross-sectional study in a rural community of Southeastern Kenya*. https://doi.org/10.1186/s12889-015-1802-6

Sumarmi, S., Mahmudiono, T., & Melaniani, S. (2018a). Household food insecurity and undernutrition in children below 5 years living in different geographical areas in East Java, Indonesia. In *Mal J Nutr* (Vol. 24, Issue 4).

Sumarmi, S., Mahmudiono, T., & Melaniani, S. (2018b). Household food insecurity and undernutrition in children below 5 years living in different geographical areas in East Java, Indonesia. In *Mal J Nutr* (Vol. 24, Issue 4).

Suratri, M. A. L., Putro, G., Rachmat, B., Nurhayati, Ristrini, Pracoyo, N. E., Yulianto, A., Suryatma, A., Samsudin, M., & Raharni. (2023). Risk Factors for Stunting among Children under Five Years in the Province of East Nusa Tenggara (NTT), Indonesia. *International Journal of Environmental Research and Public Health*, *20*(2), 1640. https://doi.org/10.3390/ijerph20021640

Tasic, H., Akseer, N., Gebreyesus, S. H., Ataullahjan, A., Brar, S., Confreda, E., Conway, K., Endris, B. S., Islam, M., Keats, E., Mohammedsanni, A., Wigle, J., & Bhutta, Z. A. (2020). Drivers of stunting reduction in Ethiopia: A country case study. *American Journal of Clinical Nutrition*, *112*(9), 875S-893S. https://doi.org/10.1093/ajcn/nqaa163

UNICEF. (2021). UNICEF Conceptual Framework on Maternal and Child Nutrition. *Nutrition and Child Development Section, Programme Group 3 United Nations Plaza New York, NY 10017, USA,* 2–3. www.unicef.org/nutrition%0Afile:///C:/Users/HP/Documents/KULIAH/S E M E S T E R - 6/Thesis Proposal/Journal of Diet & Nutritional Status/UNICEF Conceptual Framework.pdf

Victora, C. G., Christian, P., Paulo Vidaletti, L., Gatica-Domínguez, G., Menon, P., & Black, R. E. (2021). Series Maternal and Child Undernutrition Progress 1 Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda. *Www.Thelancet.Com*, *397*, 2021. https://doi.org/10.1016/S0140-6736(21)00394-9

Wardani, D. W. S. R., Wulandari, M., & Suharmanto, S. (2020a). The Relationship of Socioeconomic Factors and Food Security to the Incidence of Stunting in Toddlers. *Journal of Health*, *11*(2), 287–293. https://doi.org/10.26630/jk.v11i2.2230

Wardani, D. W. S. R., Wulandari, M., & Suharmanto, S. (2020b). The Relationship of Socioeconomic Factors and Food Security to the Incidence of Stunting in Toddlers. *Journal of Health*, *11*(2), 287–293. https://doi.org/10.26630/jk.v11i2.2230

Weatherspoon, D. D., Miller, S., Ngabitsinze, J. C., Weatherspoon, L. J., & Oehmke, J. F. (2019). Stunting, food security, markets and food policy in Rwanda. *BMC Public Health*, *19*(1). https://doi.org/10.1186/s12889-019-7208-0

Yang, Q., Yuan, T., Yang, L., Zou, J., Ji, M., Zhang, Y., Deng, J., & Lin, Q. (2019). Household food insecurity, dietary diversity, stunting, and anaemia among left-behind children in poor rural areas of China. *International Journal of Environmental Research and Public Health*, *16*(23). https://doi.org/10.3390/ijerph16234778

Yazew, T. (2022). 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. *Journal of Nutrition and Metabolism*, *2022*. https://doi.org/10.1155/2022/3981417

Yuliantini, E., Sukiyono, K., Yuliarso, M. Z., & Sulistyo, B. (2022a). Food Security and Stunting Incidences in the Coastal Areas of Indonesia. *Open Access Macedonian Journal of Medical Sciences*, *10*(F), 454–461. https://doi.org/10.3889/oamjms.2022.9335

Yuliantini, E., Sukiyono, K., Yuliarso, M. Z., & Sulistyo, B. (2022b). Food Security and Stunting Incidences in the Coastal Areas of Indonesia. *Open Access Macedonian Journal of Medical Sciences*, *10*(F), 454–461. https://doi.org/10.3889/oamjms.2022.9335.