

The Effect of Economic Status and Mother's Knowledge in Stunting Cases: A Systematic Review

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Abstract

Background: A reduction in the incidence of stunting has been reported globally over the past few decades. However, stunting remains a big problem for developing countries. The purpose of this research was to review in-depth The Role of Social Economy, Knowledge, behaviour, and stunting in Stunting Cases. Narrative studies with scientific journal database sources published in PubMed, Proquest, Science Direct, and Google Scholar were used. The keywords used in the search were Social economy, Knowledge, behaviour, and stunting. The search included research published within the last five years, that is, 2018-2022. A total of 144 articles were found according to the search titles, and 11 articles were selected for review. After the article was obtained, it was tabulated in an Excel table. The findings show that the family economy will support children's nutritional intake and needs so that children are not underweight during this period of growth and development. A good family economy can support childcare patterns, and healthy home settlements so they can access clean water. The family economy plays a role in overcoming the large number of children and preventing early marriages. Parents' knowledge will influence the mother's attitude in caring for and caring for children from birth to adolescence. This knowledge is closely related to the practice of exclusive breastfeeding, traditional food nutrition, the management of food hygiene, the diversity of children's diets, the nutritional value of food including the fulfilment of certain nutrients both micro and macro and education about stunting. Economic status has a very important impact on stunting prevention because it will affect other aspects related to stunting. Not only that, all the research that has been reviewed shows that the educational level of parents will affect attitudes about how to care for their children.

Keywords: *Economic Status, Mother's Knowledge, Stunting, Systematic Review.*

INTRODUCTION

Stunting is one of the nutritional problems experienced by toddlers globally (1–3). About 56% of stunted children live in Asia and 36% in Africa (2–6). Meanwhile, around 30% of children under five are stunted globally (4–7). Stunted children make up around a quarter of all young children worldwide, primarily in low-income and middle-income nations (8). The problem of urbanization in developing countries is now causing new problems, namely increasing poverty and slum settlements (9–12). Children who grow up in slum areas are vulnerable to stunting (13–16).

Stunting can occur due to malnutrition or malnutrition, especially in the first 1000 days of life (17,18,27,19–26). Stunting is indicated to be the cause of death of 1 million children each year (21,22). This is due to frequent illness and body posture that is not ideal during the growth period (28). The bad effects of stunting can also occur in the short term. Some of the disorders associated with stunting are intelligence, brain disorders, metabolic disorders in the body and growth disorders (21,22,29). Meanwhile, in the long term, stunting can cause a decrease in cognitive abilities and academic achievement, a high risk of diabetes, and decreased

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immunity which increases susceptibility to disease, obesity, cancer, heart and blood vessel disease, stroke, poverty, and disability in old age. Poverty occurs as a result of the quality of work with short people leading to low productivity (2,3,18,19,22,30,31).

Previous studies reported that many factors influence stunting (17,28,32,33). However, the most influential basic factors are the mother's economy and education (5,34), as well as other intermediary factors such as the number of family members, parents' height and mother's age (28,35,36). Followed by proximal factors such as age and exclusive breastfeeding (17,37). There is an information gap on how stunting is affected by a country's economic growth (38–44). For Instance, (38) found an important role in economic growth in reducing the prevalence of stunting. This is in line with several studies (43–45) found that the contribution of economic growth may be even more influential than previously thought.

On the other hand, According to (40) the relationship between economic growth and malnutrition in early childhood is quantitatively very small. (46) also found that economic growth has a very small positive impact on the likelihood of stunting occurring in Africa. Both studies rely on multilevel modelling that combines micro and macro data to draw conclusions (42). In particular, when combining both types of data, small cross-country variations are likely to exacerbate measurement error bias and make it difficult to document strong outcome relationships between the variables studied (42). In several previous studies, it was also reported that stunting was still influenced by the economy but had no significant impact (47,48). Several studies have found that the impact of economic growth on stunting cases tends to be significant but moderate (46,49).

Increased maternal knowledge regarding the health benefits of food among mothers in Ecuador reduced child malnutrition (50). A cross-sectional study in Indonesia and Bangladesh concluded that increased maternal education resulted in a significant reduction in the risk of stunting in both countries (51). Several studies have reported that a mother's nutritional knowledge is positively related to a child's nutritional status (52–54). Other research also shows that knowledge does not always direct mothers to provide good nutrition to their children (36,55,56).

The magnitude of the influence of the determinants of stunting varies in the coastal, highland, and inland areas. This is due to socio-economic diversity, wealth inequality, eating culture and geographical location (57–59). Various strategies and efforts have been made to overcome malnutrition, including stunting. In Indonesia, stunting is handled through the five pillars of the national strategy to accelerate its handling (60,61). In China, food supplements and nutrition education are used to improve the nutrition of children in underdeveloped rural communities (62). In Madagascar, stunting prevention has been carried out over the last few decades (63). In Malaysia, primary care is used to correct malnutrition (64). In Ethiopia, stunting is prevented and treated through a cross-sectoral child welfare strategy (65).

There are so many conflicting opinions regarding the relationship between economic influence, knowledge and attitudes towards stunting, for this reason, researchers will look deeper by reviewing the latest and previously published articles so that results are obtained that can represent the entire debate that has occurred. In-depth review research is still needed to determine the causal relationship between economic factors, attitudes and knowledge of stunting by looking at the causal relationships that occur in these factors.

This review aims to provide an in-depth review regarding the relationship between economic status and knowledge of the incidence of stunting by taking several previously published articles from reputable sources. The novelty of this study is that it does not thoroughly discuss the economy and knowledge of previous stunting events. Based on this review, it is hoped that it will become a new source for examining the relationship between economics, attitudes and knowledge collectively on the incidence of stunting. This review is also expected to provide benefits to policymakers worldwide in preventing stunting and intervening in the three factors studied.

Method

Narrative studies with scientific journal database sources published in Proquest, Science Direct, and Google Scholar were used. The keywords used in the search were “Social”, AND “Economy”, AND “Knowledge”, AND “stunting”. The search included research published within the last five years, that is, 2018-2022. A total of 144 articles were found according to the search titles, and 11 articles were selected for review. After the

article was obtained, it was tabulated in an Excel table. A flowchart of the article search process is shown in Figure 1. The inclusion criteria in this study were the population the study included articles that were published in the last 5 years and discussed the impact of the economy and knowledge on stunting cases. Articles are in English with full text. Articles that have been identified are entered into Mendeley if there is duplication and deletion are carried out. Next, the title and abstract of the article were screened. In the last phase, read the full text of the remaining articles and defend the articles that met the inclusion criteria. After that the articles that meet the criteria are extracted into a table containing; Sources, Population, research objectives, research design, and Findings.

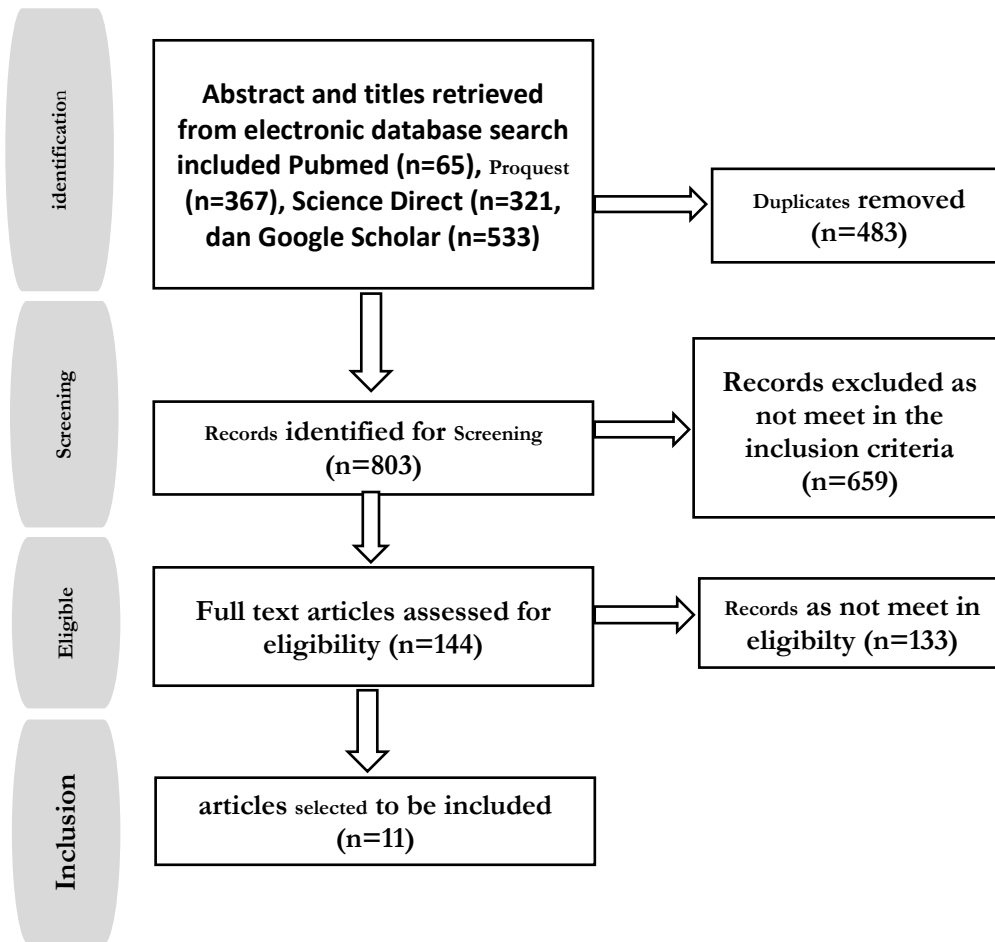


Figure 1. Research Flow Chart

FINDINGS

The Effect of Socioeconomic Status on the Incidence of Stunting

The findings show that the education and occupation of the father's parents are closely related to the income in the family, which varies in the area of domicile of the family. The family economy supports children's nutritional intake and needs so that children are not underweight during this period of growth and development. A good family economy can support parenting patterns, and healthy home settlements, namely access to clean water so that stunting does not occur. The family economy plays a role in overcoming the large number of children and preventing early marriages. It can be seen that the types of research have varied by combining quantitative and qualitative research. The population in previous studies was also identified as involving families, children, toddlers and adolescents

Table 1. The effect of socioeconomic status on the incidence of stunting

Sources	Country	Population	Research Type	Research Objectives	Findings
(66)	India	The National Family in India	Quantitative Research	To examine socio-economic inequality in child malnutrition in 640 districts of India.	The results showed that around 38% of children in India were stunted and 35% were underweight during the period from 2015 to 2016. The prevalence of stunting and wasting varies widely across Indian districts. The districts that have a higher percentage of malnourished children are from certain areas such as the central, eastern and western parts of the country. On average, about 35% of households in a district have access to safe drinking water and 42% of households have unsafe access to clean water. This study found an inverse relationship between the district's economic development and childhood stunting and underweight.
(66)	India	Child malnutrition in 640 districts	A quantitative study using secondary data	To identify socio-economic inequality in child malnutrition	Has il research shows that around 38% of children are stunted and 35% are underweight during 2015–2016. The prevalence of stunting and wasting varies greatly across Indian districts (13 to 65% to 67%). The districts that have a higher percentage of malnourished children are from specific areas such as the central, eastern and western parts of the country.
(67)	Nepal	3773 youth aged 10-19 years (1888 boys and 1885 girls).	Quantitative Research	This study aims to provide an overall picture of the sociocultural and economic determinants of stunting and thinness in adolescent boys and girls in Nepal.	The results of the study show that the relationship between work and father's education, household income, number of earning household members, the geographical place of residence, caste/ethnicity and nutritional knowledge are associated with stunting, with higher odds for older males and adolescents. Father's occupation, education, household income, geographic region, caste/ethnicity and knowledge of nutrition are associated with wasting, with higher odds for boys and younger adolescents
(68)	Sub-Saharan Africa	data from nationally representative demographic and health- and multiple indicator cluster-surveys (DHS and MICS) to disaggregate	cross-sectional Demographic and Health Surveys (DHS)	evaluate how the prevalence of stunting has changed based on socioeconomic status and rural/urban residence, and assess inequalities in	Stunting disproportionately affects the poorest villages and regions. Inequalities are also evident in access to health care and provision of quality food

		the stunting prevalence by wealth quintile and rural/urban residence		children's food quality and access to maternal and child health care.	complementary food. In conclusion, the regional socio-economic will affect the stunting rate in the region
(69)	Indonesia	total of 105 respondents	This was a quantitative descriptive study using a cross sectional approach	to determine the relationship between socio-economic status with the prevalence of stunting among children under five years old	the indicator of social status related to the prevalence of stunting is maternal education level. Other factors related to stunting include child's age and history of exclusive breastfeeding
(70)	Indonesia	Respondents were 80 children aged 48-60 months in urban and rural areas of West Java.	cross-sectional method	to determine the relationship between stunting, socioeconomic status, and children's motor skill development	stunting prevalence in rural areas was higher than in urban areas. As much as 30 % of children in rural areas and only 12.5 % of children in urban areas were categorized as stunted. There is no significant association between stunting with the family's socioeconomic status and motor skill development.

The Effect of Mother's Knowledge on the Incidence of Stunting

The findings show that parental knowledge will influence the attitudes and practices of mothers in caring for and caring for children from birth to adolescence. This knowledge is closely related to the practice of exclusive breastfeeding, traditional food nutrition, the management of food hygiene, the diversity of children's diets, the nutritional value of food including the fulfilment of certain nutrients both micro and macro and education about stunting.

Previous studies have shown that the study population involved mothers and their children, toddlers and caregivers. The research designs carried out in previous studies showed various types including cross-sectional, observational analytic and community-based cross-sectional designs. The research design is still less varied so this can be considered in future research to use methods that have not been used before by combining quantitative and qualitative research.

Table 2. The effect of mother's knowledge on the incidence of stunting

Sources	Country	Population	Research Type	Research Objectives	Findings
(82)	Malaysia	The participants in this study were all mothers who have toddlers	Study with cross-sectional design	To see the relationship between knowledge and attitudes about stunting and the incidence of stunting	The results showed that knowledge about stunting was good, namely 37 (77.1%), and the mother's attitude about stunting was positive by 40 (83.3%) and the incidence of stunting was 62.5%. The findings with the Chi-Square test analysis show that there is a significant influence between knowledge and attitudes about stunting and stunting events where knowledge with prevalence values and confidence intervals is 7.2 (1.59 – 32.67) and attitudes with prevalence values and confidence intervals of 7.0 (1.23 – 39.78)
(83)	Indonesia	The population in this study were all mothers in agricultural areas who had	Analytical observational research using a	To see the relationship between mother's	The research results show that there is no relationship between traditional food

		children aged 12–59 months in the Districts of Jambu, Renah Semanek and Pagar Jati with a total of 137 people.	cross-sectional design	knowledge, attitudes, and practices in the traditional feeding of short and thin toddlers to farming families in Central Bengkulu Regency	nutrition knowledge and the incidence of stunting
(84)	Ghana	226 mother/caregiver pairs and child	Cross-sectional study design	To explore the relationship between maternal nutritional knowledge and stunting and its effect on the nutritional status of children aged 6-59 months in Sefwi Wiawso Village, Ghana.	The results showed that the average level of nutrition knowledge (61.5%) was for caregivers/mothers. Most caregivers (92.3%) started breastfeeding within one hour of delivery. As many as 66% of mothers practice exclusive breastfeeding. Complementary feeding was started at 6 months in 83.6% of cases. The prevalence of underweight, wasting and stunting was 8.29%, 10.23% and 16.74% respectively. There was no significant relationship between maternal nutrition/caregiver knowledge and child malnutrition status although the risk of wasting decreased with increasing caregiver knowledge of nutrition ($p=0.118$).
(85)	India	A total of 710 adolescents were randomly selected aged 10-17 years. The study participants were the mothers of these teenagers.	community-based cross-sectional study	This study focuses on assessing maternal nutritional knowledge and hygiene practices and their influence on dietary diversity and nutritional status of school adolescents in Dhaka city .	The results of the study showed that one-third (35.8%) of mothers maintained good hygiene and sanitation. Although 53.1% of them had satisfactory general knowledge of healthy diets, only 6.5% demonstrated good knowledge of the nutritional value of food. The prevalence of short, thin and obese were 8, 4.6 and 5.8%, respectively. Fair hygiene practices were positively related ($P = 0.048$) to height-for-age z-scores. Mothers' knowledge of the nutritional value of food was positively related ($P = 0.027$) to the diversity of adolescent diets.
(86)	Indonesia	The population in this study were all mothers who had children under five in Kutelintang village in July-August, totalling 30 people.	This study uses a cross-sectional research design	To find out the relationship between knowledge and mothers' attitudes towards stunting in Kutelintang Village, Gayo Lues Regency in 2022	The results showed that 12 people (40.0%) had less knowledge, 18 people (60.0%) had a negative attitude towards stunting and 21 people (70.1%) had stunted. 12 people (40%), the results of the Chi-Square test, namely the results obtained p value = 0.002. This value is <0.05 so the hypothesis is accepted, which means that there is a significant relationship between Knowledge and Mother's Attitudes towards Stunting Incidents in Kutelintang Village, Gayo Lues Regency in 2022.

DISCUSSION

Socio-economic factors that affect the child's growth process are income, education, and parental knowledge (66). Economic conditions are related to a family's ability to meet nutritional needs and how a person chooses health services for pregnant women and toddlers (71). Family income and parental education can be family socio-economic factors that can cause stunting in children (72). The level of family income has a significant relationship with the incidence of stunting, low economic status is considered to have a dominant influence on the incidence of wasting and stunting in children (73). Parents with sufficient income can provide nutritious and varied food (74). Families with good economic status will have access to good health services (75). Meanwhile, those with low economic status tend to consume food in less quantity, quality and variety (76).

Higher food insecurity vulnerabilities are associated with lower household socio-economic status because the affordability of nutritious food is closely related to purchasing power (77). Because poor economic growth causes children to experience malnutrition, the practice of open defecation has a positive effect on stunting and underweight inequality. Undernutrition inequality is accelerated by the mother's height and education, as well as the lack of drinking water availability. These results are similar to the research (78). Households that lack food have a higher prevalence of malnutrition (stunting, wasting and underweight) in children compared to access to adequate food in children (79,80). Adequate nutrition promotes health and disease resistance, while inadequate nutrition leads to increased severity of stunting, wasting and underweight (81)

Stunted children are at risk of experiencing increased morbidity and mortality, retarded motor and mental development, decreased intellectual and productivity, increased risk of degenerative diseases, obesity and are more susceptible to infectious diseases. Among the factors that influence the incidence of stunting, parenting plays an important role in the occurrence of growth disorders in children. Poor parenting can cause nutritional problems in society (87). Mother's nutritional knowledge is one of the factors that have a significant influence on the incidence of stunting. The role of parents, especially a mother, is very important in fulfilling child nutrition because children need the attention and support of parents in facing very rapid growth and development. To get good nutrition in children, good nutrition knowledge from parents is needed so they can provide a balanced menu of food choices. The level of parental nutritional knowledge greatly influences attitudes and behaviour in food selection (88).

The mother's knowledge about stunting is lacking but the mother's attitude regarding stunting is good because the mother does stunting prevention unconsciously, without knowing that this can prevent stunting so the mother's knowledge about stunting is lacking. Mother did not know that what she did/her attitude turned out to be good. This attitude includes an affective component that is based on emotions or feelings (84). Mother's knowledge is one part that determines the ability to apply health behaviours for families such as sorting and processing food so that nutrition is guaranteed. The task of parents, especially mothers, is needed when providing consumption to help monitor growth and development so that an understanding of nutrition is needed so that they can serve comparable food (89).

Mothers with good knowledge significantly influence the incidence of stunting. Mothers with a positive attitude have a significant effect on the incidence of stunting. Mother's education level has a relationship with the incidence of stunting in children aged 24-59 months. A woman or a mother usually takes care of children, therefore education is very important. Education causes a woman to be aware of parenting styles related to the need for good nutrition for children. In addition, a woman can also provide the necessary nutrition for her child. If the mother's education is low, it will affect the incidence of stunting. Knowledge of mothers with low education will affect the incidence of stunting where mothers do not know how to care for children and provide good food for them (82).

Research conducted by (86) shows that there is a significant relationship between the mother's attitude and the incidence of stunting in children. Attitude is an individual's tendency to react to a stimulus or object in a certain way, the form of the reaction can be a positive or negative reaction. A person's attitude can be influenced by factors such as age, occupation, education, and parity. Someone who has a negative attitude, then his actions and behaviour will tend to be negative so in this case it can have an impact on the occurrence of nutritional problems in children (86). Another study by (90) showed that adequate mothers' knowledge and attitude towards diet could be a factor in preventing nutritional problems (stunting and malnutrition). The behaviour

of consumption patterns that are assessed shows that there is still a lack of fulfilment of certain nutrients, both macro (fibre) and micronutrients, against the reference number for nutritional adequacy (86). However, another study by Betty, et.al showed different results, namely finding no relationship between maternal knowledge, attitudes, and practices with the incidence of stunting (91).

Some of the factors causing stunting that cause high stunting are low levels of knowledge and inadequate practice in caring for children with stunting, which means that an increase in the incidence of stunting requires treatment to increase mother's knowledge and improve the ability of mothers to practice caring for children with stunting by doing education. Most nutrition education interventions aim to reduce nutritional problems targeted at changing the knowledge, attitudes, and behaviour of parents or caregivers related to fulfilling toddler nutrition. The attitude change approach used usually focuses on parents as the closest people in fulfilling nutrition, solids, early initiation of breastfeeding, breastfeeding for up to 2 years, diversity of food, diet, and recommended drinks (92).

The incidence of stunting in toddlers is of course not only due to a lack of knowledge or a bad mother's attitude in fulfilling nutrition in children. However, other indirect factors play a major role in the occurrence of stunting in toddlers, including age, education level, income and mother's occupation. From the results of this study, it was found that most of the under-fives who were stunted were young adult mothers aged between 18-35 years, with primary and secondary education, with income below the minimum wage and mothers who did not work. Age, gender, and toddler age also contribute to stunting. Mothers who have higher education tend to have children with good nutrition and vice versa (83).

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REFERENCES

- WHO. Reducing stunting in children: equity considerations for achieving the Global Nutrition Targets 2025. Switzerland; 2018.
- KEMENKES R. Launching Hasil Studi Status Gizi Indonesia. 2021.
- Badan Penelitian dan Pengembangan Kesehatan. Riset Kesehatan Dasar 2018. 2018.
- UNICEF. State of the World's Children 2019: Children, food and nutrition [Internet]. Unicef. 2019. 1–258 p. Available from: <https://www.unicef.org/media/63016/file/SOWC-2019.pdf>
- Vaivada T, Akseer N, Akseer S, Somaskandan A, Stefopoulos M, Bhutta ZA. Stunting in childhood: An overview of global burden, trends, determinants, and drivers of decline. *Am J Clin Nutr.* 2020;112(Suppl):777S-791S.
- Victora CG, Christian P, Vdaletti LP, Gatica-Domínguez G, Menon P, Black RE. Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda. *Lancet.* 2021;397(10282):1388–99.
- Okoh M. Socio-demographic correlates of overweight and obesity among women of reproductive age in Nigeria. *Afr J Reprod Health.* 2013;17(4):66–76.
- Kebede D, Prasad RPCJ, Asres DT, Aragaw H, Worku E. Prevalence and associated factors of stunting and thinness among adolescent students in Finote Selam Town, Northwest Ethiopia. *J Heal Popul Nutr.* 2021 Dec;40(1):44.
- World Health Organization. Global report on urban health: equitable, healthier cities for sustainable development [Internet]. Kobe, Japan; 2016. Available from: http://www.who.int/about/licensing/copy-right_form/index.html
- WHO. Unmasking and Overcoming Health Inequities in Urban Settings [Internet]. Switzerland: WHO Library Cataloguing-in-Publication Data; 2016. 1–145 p. Available from: http://www.who.int/about/licensing/copy-right_form/index.html
- World bank Group. Leveraging Urbanization in South Asia. Ellis P, Robert M, editors. Kanpur, Indi: Library of Congress Cataloging-in-Publication Data; 2016. 1–184 p.
- Bloem S, de Pee S. Developing approaches to achieve adequate nutrition among urban populations requires an understanding of urban development. *Glob Food Sec* [Internet]. 2017;12(February):80–8. Available from: <http://dx.doi.org/10.1016/j.gfs.2016.09.001>

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- Ezeh A, Oyeboode O, Satterthwaite D, Chen YF, Ndugwa R, Sartori J, et al. The history, geography, and sociology of slums and the health problems of people who live in slums. *Lancet* [Internet]. 2017;389(10068):547–58. Available from: [http://dx.doi.org/10.1016/S0140-6736\(16\)31650-6](http://dx.doi.org/10.1016/S0140-6736(16)31650-6)
- Lilford RJ, Oyeboode O, Satterthwaite D, Melendez-Torres GJ, Chen YF, Mberu B, et al. Improving the health and welfare of people who live in slums. *Lancet* [Internet]. 2017;389(10068):559–70. Available from: [http://dx.doi.org/10.1016/S0140-6736\(16\)31848-7](http://dx.doi.org/10.1016/S0140-6736(16)31848-7)
- Mberu BU, Haregu TN, Kyobutungi C, Ezeh AC. Health and health-related indicators in slum, rural, and urban communities: A comparative analysis. *Glob Health Action*. 2016;9(1):1–13.
- UNICEF. State of World Children: Children in an Urban World. United Nations Publications. 2012. 1–156 p.
- Mediani HS. Predictors of Stunting Among Children Under Five Year of Age in Indonesia: A Scoping Review. *Glob J Health Sci*. 2020;12(8):83.
- Bloem MW, de Pee S, Hop LT, Khan NC, Lailou A, Minarto, et al. Key strategies to further reduce stunting in Southeast Asia: lessons from the ASEAN countries workshop. *Food Nutr Bull*. 2013;34(2 Suppl):8–16.
- Hana SA, Martha IK. Faktor Risiko Kejadian Stunting Pada Anak Usia 12-36 Bulan Di Kecamatan Pati, Kabupaten Pati. *J Nutr Coll*. 2012;1(1):30–7.
- Mersmann HJ. Journal of Nutrition: Introduction. *J Nutr*. 2007;137(3):696–7.
- Crookston BT, Penny ME, Alder SC, Dickerson TT, Merrill RM, Stanford JB, et al. Children who recover from early stunting and children who are not stunted demonstrate similar levels of cognition. *J Nutr* [Internet]. 2010;140(11):1996–2001. Available from: <https://doi.org/10.3945/jn.109.118927>
- Aguayo VM, Menon P. Stop stunting: Improving child feeding, women's nutrition and household sanitation in South Asia. *Matern Child Nutr*. 2016;12(Suppl 1):3–11.
- Wiliyanarti PF, . I, . R. Peran Keluarga dan Pola Makan Balita Stunting. *J Keperawatan Muhammadiyah*. 2020 Jun;5(1).
- Novitasari PD, Wanda D. Maternal Feeding Practice and Its Relationship with Stunting in Children. *Pediatr Rep*. 2020 Jun;12(11):8698.
- Saleh A, Syahrul S, Hadju V, Andriani I, Restika I. Role of Maternal in Preventing Stunting: a Systematic Review. *Gac Sanit*. 2021;35:S576–82.
- Tamir TT, Techane MA, Dessie MT, Atalell KA. Applied nutritional investigation spatial variation and determinants of stunting among children aged less than 5 y in Ethiopia: A spatial and multilevel analysis of Ethiopian Demographic and Health Survey 2019. *Nutrition*. 2022 Nov;103–104:111786.
- Belayneh M, Loha E, Lindtjorn B. Spatial Variation of Child Stunting and Maternal Malnutrition after Controlling for Known Risk Factors in a Drought-Prone Rural Community in Southern Ethiopia. *Ann Glob Heal*. 2021 Aug;87(1):85.
- Sutarto, Mayasari D, Indriyani R. Stunting, Faktor Resiko dan Pencegahannya. *J Agromedicine*. 2018;5(1):540–5.
- Dewey KG, Begum K. Long-term consequences of stunting in early life. *Matern Child Nutr*. 2011;7(SUPPL. 3):5–18.
- Hossain M, Choudhury N, Abdullah KAB, Mondal P, Jackson AA, Walson J, et al. Evidence-based approaches to childhood stunting in low and middle income countries: A systematic review. *Arch Dis Child*. 2017;102(10):903–9.
- Mulyaningsih T, Mohanty I, Widyaningsih V, Gebremedhin TA, Miranti R, Wiyono VH. Beyond personal factors: Multilevel determinants of childhood stunting in Indonesia. *Metwally AM, editor. PLoS One*. 2021 Nov;16(11):e0260265.
- Maywita E. Faktor Risiko Penyebab Terjadinya Stunting Pada Balita Umur 12-59 Bulan Di Kelurahan Kampung Baru Kec. Lubuk Begalung Tahun 2015. *J Ris Hesti Medan Akper Kesdam I/BB Medan*. 2018;3(1):56.
- Umeta M, West CE, Verhoef H, Haidar J, Hautvast JGAJ. Factors associated with stunting in infants aged 5-11 months in the Dodota-Sire District, Rural Ethiopia. *J Nutr*. 2003;133(4):1064–9.
- Dietz WH. Double-duty solutions for the double burden of malnutrition. *Lancet* [Internet]. 2017;390(10113):2607–8. Available from: [http://dx.doi.org/10.1016/S0140-6736\(17\)32479-0](http://dx.doi.org/10.1016/S0140-6736(17)32479-0)
- Victora CG, Adair L, Fall C, Hallal PC, Martorell R, Richter L, et al. Maternal and child undernutrition: consequences for adult health and human capital. *Lancet*. 2008;371(9609):340–57.
- Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, De Onis M, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet*. 2013;382(9890):427–51.
- Darteh EKM, Acquah E, Kumi-Kyereme A. Correlates of stunting among children in Ghana. *BMC Public Health*. 2014;14(1):1–7.
- Ruel MT, Alderman H. Nutrition-sensitive interventions and programmes: How can they help to accelerate progress in improving maternal and child nutrition? *Lancet* [Internet]. 2013;382(9891):536–51. Available from: [http://dx.doi.org/10.1016/S0140-6736\(13\)60843-0](http://dx.doi.org/10.1016/S0140-6736(13)60843-0)
- Vollmer S, Harttgen K, Subramanyam MA, Finlay J, Klasen S, Subramanian S V. Association between economic growth and early childhood undernutrition: Evidence from 121 Demographic and Health Surveys from 36 low-income and middle-income countries. *Lancet Glob Heal* [Internet]. 2014;2(4):e225–34. Available from: [http://dx.doi.org/10.1016/S2214-109X\(14\)70025-7](http://dx.doi.org/10.1016/S2214-109X(14)70025-7)
- Vollmer S, Harttgen K, Subramanyam MA, Finlay J, Klasen S, Subramanian S V. Association between economic growth and early childhood nutrition. *Lancet Glob Heal*. 2014;2(9):e501–2.
- Harttgen K, Klasen S, Sebastian V. Economic Growth and child Undernutrition in Africa RTG 1666 Global Food Discussion Papers No. 14. germany; 2012.

- Alderman H, Haddad L, Headey DD, Smith L. Association between economic growth and early childhood nutrition. *Lancet Glob Heal* [Internet]. 2014;2(9):e500. Available from: [http://dx.doi.org/10.1016/S2214-109X\(14\)70266-9](http://dx.doi.org/10.1016/S2214-109X(14)70266-9)
- Smith LC, Haddad L. Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era. *World Dev* [Internet]. 2015;68(1):180–204. Available from: <http://dx.doi.org/10.1016/j.worlddev.2014.11.014>
- O’Connell SA, Smith C. Economic growth and child undernutrition. *Lancet Glob Heal* [Internet]. 2016;4(12):e901–2. Available from: [http://dx.doi.org/10.1016/S2214-109X\(16\)30250-9](http://dx.doi.org/10.1016/S2214-109X(16)30250-9)
- Mary S, Saravia-Matus S, Gomez y Paloma S. Does nutrition-sensitive aid reduce the prevalence of undernourishment? *Food Policy* [Internet]. 2018;74(December 2017):100–16. Available from: <https://doi.org/10.1016/j.foodpol.2017.11.008>
- Harttgen K, Klasen S, Vollmer S. Economic Growth and Child Undernutrition in sub-Saharan Africa Author (s): Kenneth Harttgen , Stephan Klasen and Sebastian Vollmer Source : *Population and Development Review* , Vol . 39 , No . 3 (SEPTEMBER 2013) , pp . 397-412 Published by : Population. JSTOR. 2023;04(46):397–412.
- Hou XH. Stagnant stunting rate despite rapid economic growth in Papua New Guinea: factors correlated with malnutrition among children under five. *Policy Res Work Pap - World Bank* [Internet]. 2015;(7301):17-pp. Available from: <https://openknowledge.worldbank.org/bitstream/handle/10986/22173/Stagnant0stunt00children0under0five.pdf?sequence=1>
- Subramanyam MA, Kawachi I, Berkman LF, Subramanian S V. Is economic growth associated with reduction in child undernutrition in India? *PLoS Med*. 2011;8(3):e1000424.
- Headey DD. Developmental Drivers of Nutritional Change: A Cross-Country Analysis. *World Dev* [Internet]. 2013;42(1):76–88. Available from: <http://dx.doi.org/10.1016/j.worlddev.2012.07.002>
- Penafiel D, Termote C, Lachat C, Espinel R, Kolsteren P, Van Damme P. Barriers to Eating Traditional Foods Vary by Age Group in Ecuador With Biodiversity Loss as a Key Issue. *J Nutr Educ Behav* [Internet]. 2016;48(4):258-268.e1. Available from: <http://dx.doi.org/10.1016/j.jneb.2015.12.003>
- Semba RD, de Pee S, Sun K, Sari M, Akhter N, Bloem MW. Effect of parental formal education on risk of child stunting in Indonesia and Bangladesh: a cross-sectional study. *Lancet*. 2008;371(9609):322–8.
- Solon FS, Florentino RF, Arnold JC, Engel RW, Aguillon DB, Tandez A, et al. The bulacan nutrition and health study: A summary report of a longitudinal study in infants. *J Trop Pediatr*. 1984;30(6):324–9.
- Müller O, Krawinkel M. Malnutrition and health in developing countries Olaf. *JAMC*. 2005;02(August):279–86.
- Appoh LY, Krekling S. Maternal nutritional knowledge and child nutritional status in the Volta Region of Ghana. *Matern Child Nutr*. 2005;1(2):100–10.
- Claeson M, Waldman RJ. The evolution of child health programmes in developing countries: From targeting diseases to targeting people. *Bull World Health Organ*. 2000;78(10):1234–45.
- Lee RG, Garvin T. Moving from information transfer to information exchange in health and health care. *Soc Sci Med*. 2003;56(3):449–64.
- Jemere T, Getahun B, Tadele F, Kefale B, Walle G. Poor sleep quality and its associated factors among pregnant women in Northern Ethiopia, 2020: A cross sectional study. *PLoS One*. 2021;16(5 May):1–9.
- Castro-Bedriñana J, Chirinos-Peinado D, De La Cruz-Calderón G. Predictive model of stunting in the Central Andean region of Peru based on socioeconomic and agri-food determinants. *Public Heal Pract*. 2021 Nov;2:100112.
- Gatica-Domínguez G, Mesenburg MA, Barros AJD, Victora CG. Ethnic inequalities in child stunting and feeding practices: results from surveys in thirteen countries from Latin America. *Int J Equity Health*. 2020 Dec;19(1):53.
- TNP2K. Strategi Nasional Percepatan Pencegahan Anak Kerdil (Stunting) Periode 2018-2024. Edisi Kedu. Jakarta; 2019.
- Lestari S, Fujiati II, Keumalasari D, Daulay M. The prevalence and risk factors of stunting among primary school children in North Sumatera, Indonesia. *IOP Conf Ser Earth Environ Sci*. 2018 Mar;125:012219.
- Li H, Yuan S, Fang H, Huang G, Huang Q, Wang H, et al. Prevalence and associated factors for stunting, underweight and wasting among children under 6 years of age in rural Hunan Province, China: a community-based cross-sectional study. *BMC Public Health*. 2022 Dec;22(1):483.
- McCuskee S, Garchitorea A, Miller AC, Hall L, Ouenzar MA, Rabeza VR, et al. Child malnutrition in Ifanadiana district, Madagascar: associated factors and timing of growth faltering ahead of a health system strengthening intervention. *Glob Health Action*. 2018 Jan;11(1):1452357.
- Argaw D, Hussen Kabthmyer R, Endale T, Wudneh A, Daniel Meshesha M, Tadesse Hirbu J, et al. Stunting and associated factors among primary school children in Ethiopia: School-based cross-sectional study. *Int J Africa Nurs Sci*. 2022;17:100451.
- Tasic H, Akseer N, Gebreyesus SH, Atallahjan A, Brar S, Confreda E, et al. Drivers of stunting reduction in Ethiopia: a country case study. *Am J Clin Nutr*. 2020 Sep;112(Supplement_2):875S-893S.
- Singh S, Srivastava S, Upadhyay AK. Socio-economic inequality in malnutrition among children in India: an analysis of 640 districts from National Family Health Survey (2015–16). *Int J Equity Health*. 2019 Dec;18(1):203.
- Van Tuijl CJW, Madjidian DS, Bras H, Chalise B. Sociocultural and economic determinants of stunting and thinness among adolescent boys and girls in Nepal. *J Biosoc Sci*. 2020;(April):1–26.
- Baye K, Lailou A, Chitweke S. Socio-economic inequalities in child stunting reduction in sub-Saharan Africa. *Nutrients*. 2020;12(1):1–11.
- Nuzuliana R, Wijhati ER. Social Economic Status and Stunting in Toddler. In: *Advances in Health Sciences Research*. 2021. p. 222–4.

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- Syihab SF, Stephani MR, Kumalasari I, Suherman A. Socioeconomic Status in Relation to Stunting and Motor Skill Development of Toddlers in Urban and Rural Areas. *J Kesehat Masy*. 2021;16(3):340–7.
- Kementerian Kesehatan RI. Situasi Balita Pendek (Stunting) di Indonesia. In Jakarta: Pusat Data dan Informasi Kemenkes RI; 2018.
- Hairil Akbar MR. Faktor Sosial Ekonomi dengan Kejadian Stunting pada Anak Usia 6-59 Bulan di Kota Kotamobagu. *Media Publ Promosi Kesehat Indones*. 2022;5(1).
- Sumiati, Arsin AA, Syafar M. Determinants of stunting in children under five years of age in the Bone regency. *Enfermería Clínica*. 2020 Jun;30(S4):371–4.
- Nasrul N, Hafid F, Ramadhan K, Suza DE, Efendi F. Factors associated with bottle feeding in children aged 0–23 months in Indonesia. *Child Youth Serv Rev*. 2020 Sep;116:105251.
- Ulfiana E, Rachmawati PD, Fadhilah DK. Contributing Factors of the Mother's Behavior in Fulfilling Nutritional Needs for Under-Five Children with Overweight and Obesity. *Indian J Public Heal Res Dev*. 2019;10(8):2713.
- Eko Setiawan, Rizanda Machmud MM. Faktor-Faktor yang Berhubungan dengan Kejadian Stunting pada Anak Usia 24-59 Bulan di Wilayah Kerja Puskesmas Andalas Kecamatan Padang Timur Kota Padang Tahun 2018. *J Kesehat*. 2018;7(2).
- Asim M, Nawaz Y. Child Malnutrition in Pakistan: Evidence from Literature. *Children*. 2018 May;5(5):60.
- Garcia S, Sarmiento OL, Forde I, Velasco T. Socio-economic inequalities in malnutrition among children and adolescents in Colombia: the role of individual-, household- and community-level characteristics. *Public Health Nutr*. 2013 Sep;16(9):1703–18.
- van Tuijl CJW, Madjidan DS, Bras H, Chalise B. Sociocultural and economic determinants of stunting and thinness among adolescent boys and girls in Nepal. *J Biosoc Sci*. 2021 Jul;53(4):531–56.
- Sari K, Sartika RAD. The Effect of the Physical Factors of Parents and Children on Stunting at Birth Among Newborns in Indonesia. *J Prev Med Public Heal*. 2021 Sep;54(5):309–16.
- Glover-Amengor M, Agbemaflle I, Hagan LL, Mboom FP, Gamor G, Larbi A, et al. Nutritional status of children 0–59 months in selected intervention communities in northern Ghana from the africa RISING project in 2012. *Arch Public Heal*. 2016 Dec;74(1):12.
- Indriani F, Romdiyah, Setiani FT. Relationship of Knowledge and Attitude about Stunting with Stunting Evidence. *Babali Nurs Res*. 2022 Jul;3(2):110–6.
- Simanjuntak BY, Haya M, Suryani D, Khomsan A, Ahmad CA. Maternal Knowledge, Attitude, and Practices about Traditional Food Feeding with Stunting and Wasting of Toddlers in Farmer Families. *Kesmas Natl Public Heal J*. 2019 Nov;14(2):58–64.
- Forgh G, Apprey C, Frimpomaa Agyapong NA. Nutritional knowledge and practices of mothers/caregivers and its impact on the nutritional status of children 6–59 months in Sefwi Wiawso Municipality, Western-North Region, Ghana. *Heliyon* [Internet]. 2022;8(12):e12330. Available from: <https://doi.org/10.1016/j.heliyon.2022.e12330>
- Arulmohi M, Vinayagamorthy V, R. DA. Physical Violence Against Doctors: A Content Analysis from Online Indian Newspapers. *Indian J Community Med*. 2017;42(1):147–50.
- Yusridawati. The Relationship of Knowledge and Mother's Attitude to Stunting Incidence in Kutelintang Village, Gayo Lues District Year 2022. *Sci Midwifery*. 2022;10(5):3685–93.
- Anas EDODSE. Hubungan Sikap dan Pengetahuan Ibu Terhadap Kejadian Stunting pada Anak Baru Masuk Sekolah Dasar di Kecamatan Nanggola. *J Kesehat Andalas*. 207AD;6(3).
- Fitriani D. Hubungan Pengetahuan Dan Sikap Ibu Dengan Kejadian Stunting Pada Balita di Desa Arongan Kecamatan Kuala Pesisir Kabupaten Nagan Raya. *J Biol Educ*. 2022;10(1).
- Simanjuntak SE, Zuska F, Sinaga TR, Rachmat B. Faktor – Faktor Yang Berhubungan dengan Stunting Anak Umur 0-59 Bulan. *J Ilm Kesehat*. 2022;4(3):374–82.
- Marchianti ACN, Rachmawati DA, Astuti ISW, Raharjo AM, Prasetyo R. The Impact Of Knowledge, Attitude, And Practice Of Eating Behavior On Stunting And Undernutrition Pengaruh. *J Berk Epidemiol*. 2022;10(2):140–50.
- Munir Z, Audyna L. Pengaruh Edukasi Tentang Stunting Terhadap Pemgetahuan Dan Sikap Ibu Yang Mempunyai Anak Stunting. *J Keperawatan Prof*. 2022;10(2):29–54.
- Naulia RP, Hendrawati H, Saudi L. Pengaruh Edukasi Gizi Terhadap Pengetahuan dan Sikap Ibu dalam Pemenuhan Nutrisi Balita Stunting. *J Ilmu Kesehat Masy*. 2021;10(02):95–101..