

Food consumption, culture, and living environment's impact on stunting cases: A systematic review

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ABSTRACT

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Received: 6 September 2023

Revised: 9 October 2023

Accepted: 12 October 2023

Published: 30 December 2023

Citation:

Loihala, M., Indar, I., Syam, A., Syafar, M., Tahir Abdullah, T., and Muis, M. (2023). Food consumption, culture, and living environment's impact on stunting cases: A systematic review. *Science, Engineering and Health Studies*, 17, 23050021.

Stunting is a long-term nutritional problem in children, with many causal factors. This study aimed to review the role of food intake, culture, and living environment in Stunting cases. Narrative studies were conducted using scientific journal database sources originating from PubMed, Proquest, Science Direct, and Google Scholar. The keywords used in the search were culture, region, food intake, and stunting. The search included research published within the last five years, from 2017 to 2023. After the article was obtained, it was tabulated in an Excel table. A total of 168 articles were identified based on the search titles. Six articles focused on the impact of food Intake on stunting, and seven articles explored the relationship between living area and culture on the incidence of stunting. Factors influencing stunting, such as inadequate nutrition for pregnant women and limited access to supplements, as well as issues related to exclusive breastfeeding, were not optimally addressed. Among children, food restrictions were observed during their growth and development stages. Stunting was found to be more prevalent in rural areas compared to urban ones. In rural areas, the occurrence of stunting was linked to limited food availability and specific dietary practices within families. Conversely, in urban areas, stunting was associated with unhealthy snacking habits in children. The maternal diet during pregnancy and the dietary habits of children during their formative years exert significant influences on child development. Certain culture practices, such as lack of support for exclusive breastfeeding, and restrictions on certain foods for children, persist in some areas.

Keywords: consuming food; culture; stunting; living environment; systematic review

1. INTRODUCTION

Stunted children constitute approximately a quarter of all young children worldwide, primarily in low- and middle-income nations (Kebede et al., 2021). Stunting is a long-term nutritional issue in children due to inadequate diet and insufficient food intake (Hamed et al., 2020). It has a significant impact, both now and in the future, and can affect subsequent periods of growth and development, extending into adulthood; therefore, its effects are not limited to infancy (Masrul, 2018). Children who suffer from stunting fail to reach their maximum brain capacity, leading to a deficiency in cognitive development (Mulyaningsih et al., 2021).

According to the World Health Organization, 149 million children under the age of five experience growth retardation (Li et al., 2022). This figure varies across countries. A national nutrition survey in China showed that the prevalence of stunting and underweight in children under five years of age rose to 20.3% and 8.0%, respectively, in rural China. In Latin America and the Caribbean, the prevalence of stunting has decreased to 9.6%. Meanwhile, in Madagascar, the stunting rate is 700,000 people (Ribeli and Pfister, 2022). The prevalence of stunting in Ethiopia, India, France, Pakistan, Malaysia, and Bangladesh was reported as 37 % (Tamir et al., 2022), 39.3% (Koshy et al., 2022), 12% (Castro-Bedriñana et al., 2021), 45% (Kureishy et al., 2017), 21.8% (Chew et al., 2022), and 46% (Chakraborty et al., 2020), respectively. In Indonesia, the prevalence of stunting was 24.4% in 2021 and decreased to 21.6% in 2022.

Globally, the prevalence of stunting is relatively high, reaching 24%. Notable rates of stunting cases have been recorded in various countries, including Pakistan (45%), Papua New Guinea and Timor Leste (50%), Zambia (40%), Mozambique (43%), Nepal (37%), India (39%), Myanmar (35%), Indonesia (36%) and the United Republic of Tanzania (35%). When considering continental coverage, South Asia ranked highest for stunting (37 %), followed by eastern and southern Africa (36%), sub-Saharan Africa (36%), West and Central Africa (35%), East Asia and the Pacific (11%), with the lowest rates observed in Latin America, the Caribbean, and the Russian Federation (10%) (Saleh et al., 2021).

A reduction in the incidence of stunting has been reported globally over the past few decades. However, stunting is a major problem in developing countries (Ricardo et al., 2021). Several studies have examined the variations in stunting in various countries and found that economic and social problems are the main factors contributing to the incidence of stunting (Vaivada et al., 2020). Urbanization in developing countries has introduced new issues, such as increasing poverty and slum settlements (Bloem and de Pee, 2017). Children growing up in slum areas are particularly vulnerable to stunting (Ezeh et al., 2017).

The impact of determinants on stunting varies across coastal, highland, and inland areas. This is due to socioeconomic diversity, wealth inequality, eating culture, and geographical location (Jemere et al., 2021). Culture is one of the factors that influence maternal attitudes during pregnancy, perinatal diet, childbirth, and toddler care (Lunkenheimer et al., 2021). According to the transcultural nursing theory, several factors influence health behavior, including education, economics, regulations, policies, culture, lifestyle, social support, religion, philosophy, and technology (Ina et al., 2021).

Stunting can be prevented by focusing on a mother's role in the family, especially during the crucial 1000 days of the

first six months of a child's life when the mother is their sole source of sustenance (Jemere et al., 2021). Interestingly, the prevalence of single-child families did not show a significant correlation with the incidence of stunting (Titaley et al., 2019). However, the risk of stunting is higher for children in single-parent households (Saputri et al., 2020). In addition, polygamous families are more likely to have children with stunting compared to monogamous families (Argaw et al., 2022). Furthermore, a culture of incestuous marriage has also been associated with stunting (Hamed et al., 2020). Various strategies and efforts have been implemented globally to address malnutrition, including stunting. In Indonesia, stunting is handled through the five pillars of the national strategy to accelerate handling (Lestari et al., 2018). China utilizes food supplements and nutritional education to enhance the nutrition of children in underdeveloped rural communities (Li et al., 2022). Madagascar has successfully prevented stunting over the past few decades (McCuskee et al., 2018). In Malaysia, primary care is used to correct malnutrition (Argaw et al., 2022). In Ethiopia, stunting is prevented and treated through a cross-sectoral child-welfare strategy (Tasic et al., 2020).

In-depth studies are essential to overcome stunting, especially in inland, coastal, and mountainous areas. These regions still have limited access to services and human resources, and still adhere to the customs, culture, and habits of individuals, families, and communities who oppose health by imposing restriction on dietary practices. Certain nutrient-rich food face restrictions, and there is a deficiency in people's behaviors concerning healthy living. This phenomenon contributes significantly to stunting alongside other factors. This systematic review aimed to provide an in-depth review of the cultural, living environment, and food intake factors affecting the incidence of stunting by drawing on several previously published articles from reputable sources. The novelty of this study lies in its thorough exploration of cultural factors, region, and food intake in the context of previous stunting events. Through this systematic review, we aimed to provide a new resource for collectively understanding the relationship between culture, food intake, and region and the incidence of stunting. Policymakers globally are expected to benefit from the insights gained, helping in preventing stunting and intervention targeting the three factors under study.

2. MATERIALS AND METHODS

The articles discussed the relationship between culture, living environment, and stunting, using either quantitative or qualitative methods. This study does not confine its focus to specific regions within the country. Inclusion criteria mandated that all selected studies had to have samples comprising either children or mothers. Further refinement was based on the alignment of study objectives. In the final screening, studies lacking information on regions and cultures were excluded, even if they included stunting and several unrelated variables. The systematic review followed the guidance written by Page et al. (2021), entitled 'The PRISMA 2020 statement: An updated guideline for reporting systematic reviews'. The search included research published within the last five years, specifically from 2017–2023. A total of 168 articles were found according to the search titles, and 13 articles were selected for review (6 focusing on food Intake and stunting

and 7 exploring the relationship between living area and culture, and the incidence of stunting). Subsequently, the selected articles were organized in an Excel table for systematic analysis. The rationale for limiting the articles to the past five years was to ensure the inclusion of recent and representative articles in the analysis.

Based on the main research variables, the keywords used in the search were culture AND region OR living environment AND stunting. Narrative studies from scientific journal database, including published in PubMed, Proquest, Science Direct, and Google Scholar were used. All studies were retrieved from the Mendeley database, and duplicates were removed through electronic configuration in Mendeley software, coupled with manual comparison for similar cases. During the screening process, after studying the title and abstract of the research, articles unrelated to the research were excluded. Next, the researchers independently evaluated the full text of the study based on the inclusion criteria. The criteria stipulate that the study must involve one of the dependent variables (stunting) and the independent variable (culture or living environment). In addition, studies had to be published between 2017 to 2023, qualify as original article, and have

a sample size of no less than 30 (Chang et al., 2006). If there was uncertainty or disagreement between the two researchers, a third expert was consulted to make a final decision on study exclusion. In addition, the references of the included research were reviewed to identify other related studies.

Members of the research team independently extracted data from the included studies, based on predefined data criteria covering four aspects: population, type of study, objectives, and findings. Due to the diverse nature of the data, containing both qualitative and quantitative data, the data were separated for subsequent discussion. Qualitative research underwent thematic analysis using an inductive approach. During the analysis of the qualitative data, several stages were involved, including the identification of the components influencing stunting, particularly in terms of culture and area of residence. Quantitative data were processed using a tabulation system by separating some of the core components of the research such as population, type of research, objectives, and findings. A flowchart illustrating the article search process is shown in Figure 1.

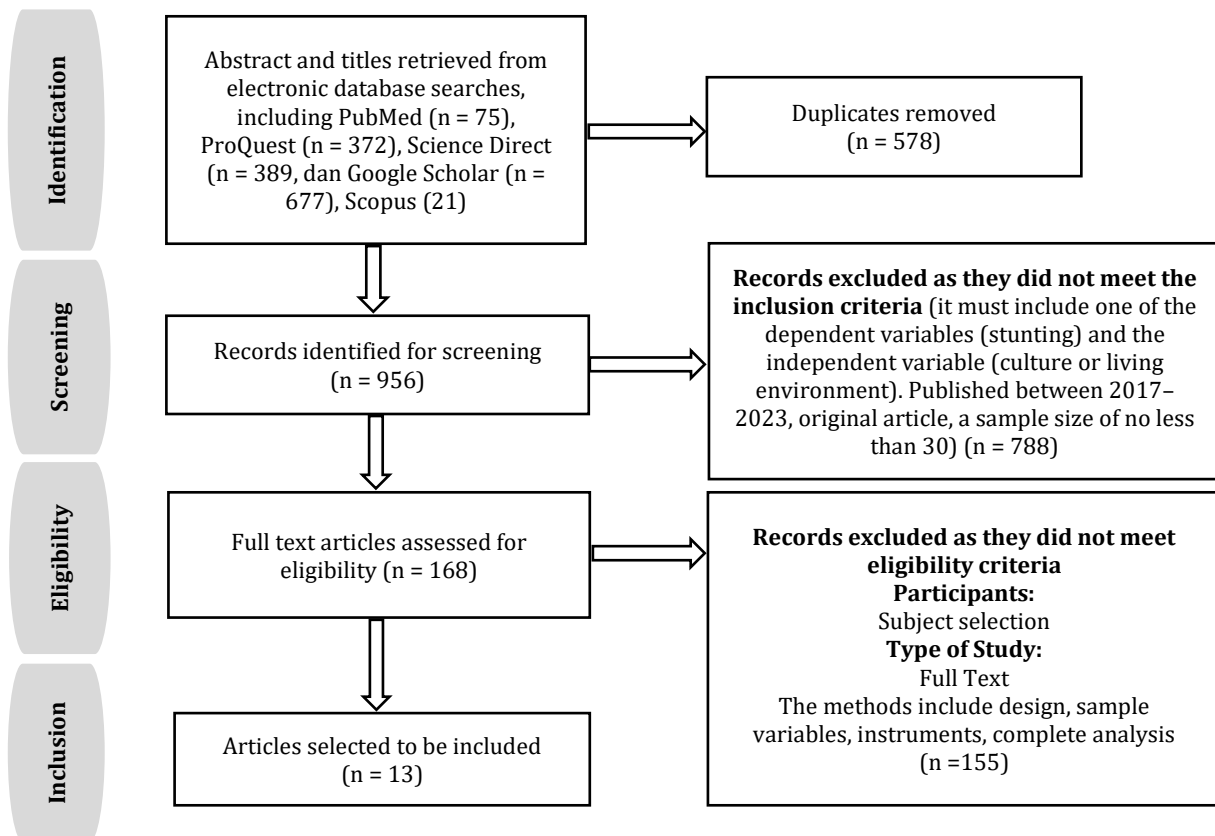


Figure 1. Research flow chart

3. RESULTS AND DISCUSSION

Based on Table 1, the majority of research was conducted in Asia and Africa, predominantly using the cross-sectional method. The most common sample size employed was > 1,000 people. Various qualitative and ecological studies investigated the temporal trend of stunting prevalence in

children under five, who are enrolled in the Food and Nutrition Monitoring System. In addition, these studies explored parental perceptions and cultural beliefs regarding overweight and underweight children and teenagers. A quantitative comparison of the study results is also presented in Table 1.

Table 1. Quantitative findings

Research Area	Percentages	Type of Research	Percentages	Number of Samples	Percentages
America	7.5%	Cross Sectional	46%	1–80	23.5
Asia	23.5%	Qualitative Study	31.5%	81–150	23.5
Africa	61.5%	Ecological Study	7.5%	151–1000	23.5
Europa	7.5%	Mix Method	7.5%	>1000	31.5
-	-	Quantitative research with Bayesian geospatial explicit regression models	-	-	-
Total	100%		100%		100%

3.1 The role of food intake on stunting

The findings show that stunting may occur if pregnant women do not receive sufficient intake of complementary foods during pregnancy, with various reinforcing factors such as birth order, mother's income, work demands during pregnancy, poverty, maternal health, and the assumption that breastfeeding does not follow culture locally. It is also known that several studies have shown that factors such as complementary feeding, caregiver body mass index, intake of calcium, iron, zinc, and phosphorus, eating habits of parents,

education and regular deworming can contribute to a reduction in the incidence of stunting in children.

Previous studies have used various methods, including quantitative cross-sectional, qualitative (group discussions and in-depth interviews), analytic observational (case-control), and qualitative (phenomenological) methods. The countries where the research was conducted are diverse, including Nigeria, Uganda, Indonesia, Rwanda, Italy, and Ethiopia. The samples typically consisted of mothers and children. Further details can be found in Table 2.

Table 2. The role of food intake on stunting

No	Authors	Area	Populations	Research Types	Purposes	Findings
1	Ariyo et al., 2021	Nigeria	390 mothers and children aged 6–23 months	Quantitative research with a cross-sectional approach	To identify the determinants of appropriate complementary feeding practices for mothers with children aged 6–23 months in Iseyin, Nigeria.	The practice of appropriate complementary feeding is very low, even when the introduction of complementary foods has been done on time. The main determinants of appropriate complementary feeding include the child's age, birth order and the mother's income. These determinants demonstrate the need to intensify efforts in promoting optimal infant and young child feeding, as well as, strengthen targeted programs.
2	Sewannonda et al., 2022	Uganda	Parents and health professionals	Qualitative research with 5 focus group discussions and 12 key informant interviews	To describe local attitudes, experiences, and beliefs regarding nutrition in early infancy in Central Uganda	Despite being aware of the advantages of exclusive breastfeeding, study participants faced numerous obstacles. Culturally, taking uncertified breast milk supplements was perceived as more acceptable compared to certified government breast milk supplements.
3	Uwiringiyimana et al., 2019	Rwanda	38 children aged 5 to 30 months	Cross-sectional study	To find out the factors associated with stunting in the northern province of Rwanda	In the northern province of Rwanda, supplemental feeding, exclusive breastfeeding, and the use of deworming pills have the potential to significantly reduce childhood stunting

Table 2. (Continued)

No	Authors	Area	Populations	Research Types	Purposes	Findings
4	Scaglioni et al., 2018	Italy	88 journal articles	Electronic data-based qualitative research (PubMed, Medline, Embase, and Google Scholar)	To identify the influencing factors children's eating behavior	Parental eating habits and feeding strategies are the most dominant determinant of children's eating behavior. Parents should introduce their children to a variety of healthy food while acting as a positive role models.
5	Argaw et al., 2019	Ethiopia	634 mothers and babies	Cross-sectional study design	Investigate the frequency and factors influencing pre-lacteal feeding practices so that program managers and implementers can adequately address public health issues	Pre-lacteal feeding is used by around one-sixth of women. Therefore, it is crucial to focus on expanding access to information on infant feeding, encouraging mothers to give birth to their children at health centers, and motivating them to start nursing as soon as possible after giving birth
6	Abaasa et al., 2021	Uganda	145 children aged 5–30 months participated study together with caregivers	Phenomenological qualitative study	To assess the opinion of health service providers and caregivers on factors responsible for persistent malnutrition among children under five in Engaju and Nyakishana sub-districts	Malnutrition in children under five is caused by historical, geographical, poverty, employment, economic challenges, domestic violence and inadequate child care. Providing literacy education to mothers, through the involvement of local leaders, and non-governmental organizations contribute to the provision of social services that will limit domestic violence and enhance awareness of men's responsibility in caring for children.

According to a previous study by Ariyo et al. (2021) conducted in Nigeria on a sample of mothers and children aged 6–23 months utilizing a cross-sectional quantitative approach, stunting is attributed to inadequate nutrition during the child's growth period. In addition, pregnant women not receiving complementary food alongside breast feeding contributes to stunting. The studies identified various reinforcing factors for stunting, including the child's age, birth order, and mother's income. Low-income families have a 6625-time greater risk of having children with stunting problems, compared to those with high incomes (Utami et al., 2019). Income is also a significant factor in efforts to improve family nutrition (Laraia et al., 2017). Low income has a negative impact on fulfilling child nutrition (Brauner-Otto et al., 2019; Ferdous et al., 2016). In addition, children experiencing stunting have diminished chance of success. Stunting are often associated with weak cognitive abilities, creating barriers to future job opportunities (Fink et al., 2016).

According to a previous study (Sewannonda et al., 2022), factors such as premature birth, diarrhea, fever, gastrointestinal illnesses, and malnutrition increase the

likelihood of stunting during pregnancy. There is a strong correlation between knowledge about the benefits of exclusive breastfeeding and factors such as work demands, physical appearance, pain, poverty, and maternal health (Sewannonda et al., 2022; Uwiringiyimana et al., 2019). In Ethiopia, maternity leave is offered only during the two-month postpartum period, influencing working mothers not to provide exclusive breastfeeding for the recommended first six months (Jennings and Hirbaye, 2008). Studies show that there is a significant difference (10–30%) in the behavior of giving exclusive breastfeeding to infants between working and non-working mothers (Alemayehu et al., 2009). The mother's occupation affects parenting time and is reported as the main reason for lower rates of exclusive breastfeeding and shorter breastfeeding durations (Abdulwadud and Simpson, 2006). Not fulfilling exclusive breastfeeding in newborns is one of the factors causing stunting.

According to a previous study, children's risk of stunting can be decreased by regularly administering deworming tablets. The WHO recommends the use albendazole (ALB) or mebendazole, two medications used to treat worms, to promote weight and height gain in children. Deworming has

been shown to be effective in improving the nutritional status of children (Sungkar et al., 2017). Stunted children under 3 years of age are known to be able to adjust to improve growth and development after receiving treatment. There is an interaction between food, micronutrients, and deworming (praziquantel) (Bieri et al., 2014; Bundy et al., 2009). Diarrhea caused by intestinal worms has been reported to be associated with stunting, as it directly reduces the level of insulin-like growth hormone (IGF-1) (Jones et al., 2015). In the northern province of Rwanda, initiatives emphasizing good nutrition during the supplemental feeding stage, exclusive breastfeeding, and the use of deworming pills have the potential to significantly reduce stunting in children (Uwiringiyimana et al., 2019).

Mothers' education is an important factor in preventing stunting among toddlers (Scaglioni et al., 2018). Toddler food intake is influenced by mother's educational level (Scaglioni et al., 2018). Children whose mothers are highly educated are less likely to experience stunting, compared to those with less educated mothers (Argaw et al., 2019). The willingness of mothers to bring their children to medical facilities and receive helpful health information, and the involvement of nutritionists at the Community Health Center, who routinely visit mothers' homes with undernourished toddlers, are two factors that can affect the quality of child growth (Suryani et al., 2022). Mothers with higher levels of education are directly proportional to having sufficient knowledge to fulfill their toddlers' nutritional needs. Mother's education is related to the nutritional status of toddlers, exerting a significant impact on the overall nutritional intake of the family (Suryani et al., 2018, 2022).

The causes of growth problems in early life include malnutrition, providing complementary foods for breast milk (MP-ASI) either too early or too late, and providing food that is not appropriate for the child's age (Ariyo et al., 2021). Stunting is caused by poor maternal health and nutrition, poor

feeding practices, and lack of nutrient-rich foods (UNICEF, 2016). The term 'feeding pattern' encompasses nutritional intake, involving the type, amount, and schedule of meals required to meet the nutritional needs of children (Sewannonda et al., 2022). Good feeding behavior was guided by a balanced nutrition program, while poor feeding behavior greatly affects the growth and development of children, contributing to issues such as stunting (Ina et al., 2021). Good nutritional status must be supported by parenting and eating patterns provided by parents to their children (Qolbiyah et al., 2021).

3.2 The role of living area and culture on the incidence of stunting

The findings show that the incidence of stunting is higher in rural areas than in urban areas. Stunting occurs in poor families in rural areas because of limited food availability and a lack of understanding of certain foods consumed by these families. In contrast, patterns of unhealthy snacking behavior in children have an impact on the prevalence of stunting in metropolitan settings. Additionally, the posture of the short mother during pregnancy, which results in the birth of short children, affects the incidence of stunting. The prevalence of malnourished mothers is higher in rural areas than in urban locations. The rate of stunting is affected by the mother's age and level of education, which affects the family's decision-making patterns in both rural and urban settings. Previous research utilized various methods including qualitative studies employing FGDs, ecological studies using SISVAN data, mix method, cross-sectional studies with secondary data, and quantitative studies using Bayesian explicit geospatial regression models. The countries where the research was conducted are diverse, including Nigeria, Brazil, Indonesia, Laos, Ethiopia, and Malawi. The sample typically consisted of mothers and children. Further details are presented in Table 3.

Table 3. The role of living area and culture on the incidence of stunting

No	Authors	Area	Populations	Research Types	Purposes	Findings
1	Adeomi et al., 2022	Nigeria	8 rural and urban communities. informants amounted to 76 mothers and adolescents aged 6–19 years	Qualitative study using focus group discussion (FGD)	To investigate parental perceptions of and cultural beliefs around overweight and underweight kids and teens	The view of mothers towards underweight and overweight children and adolescents is erroneous. The majority of mothers did not mention dietary limitations or other cultural beliefs. To lessen misunderstandings, mother education initiatives on child nutrition must be implemented.
2	Corrêa et al., 2023	Brazil	Children under the age of five	Ecological study with data from SISVAN	to examine the temporal trend of stunting prevalence in kids under five who are enrolled in the Food and Nutrition Monitoring System (SISVAN) in Brazil's Northern Territory from 2008 to 2017.	From 2008 to 2017, there was a decline in the prevalence of stunting in particular in the three states and the Northern Territory as a whole. The prevalence of child stunting declined in the four states as more people were covered by the Food and Nutrition Control System

Table 3. (Continued)

No	Authors	Area	Populations	Research Types	Purposes	Findings
3	Widyaningsih et al., 2022	Indonesia	3887 children aged 0–59 months	Mix Method	This study seeks to investigate the factors influencing stunting in Indonesia according to SES and rural-urban status and to evaluate the factors influencing stunting disparities according to rural-urban status.	Regarding the causes of stunting, there are minor variations. In Indonesia, it is determined by family financial circumstances. Specific treatments that target population disparities must be carried out in order to boost the effectiveness of stunting reduction initiatives.
4	Laksono et al., 2022	Indonesia	44,071 toddlers with working mothers.	Cross-sectional study using secondary data	The study aims to analyze the factors associated with the incidence of stunting in toddlers with working mothers in Indonesia	The place of residence, mother's education level, and the age of the toddlers affect the incidence of stunting among toddlers with working mothers in Indonesia.
5	Kamiya et al., 2018	Laos	100 mothers and 115 children <5 years	Cross-sectional study	To analyze the effect of maternal autonomy on childhood stunting in Laos, where the social status of women is relatively high compared to other countries.	Women's autonomy is associated with the incidence of stunting in children in Laos. Conducting more in-depth research on maternal autonomy will assist in understanding the determinants of stunting in children
6	Ahmed et al., 2021	Ethiopia	Children aged 0–59 months and 16,583 women of reproductive age from selected households	Quantitative research with Bayesian geospatial explicit regression models	To investigate geographic variation in the prevalence of stunting prevention among children under the age of 5 in Ethiopia.	Due to the substantial heterogeneity in socioeconomic, cultural, and climatic risk factors, as well as variations in Ethiopia's vulnerability to both man-made and natural disasters, subnational estimates from administrative zones reveal vast variances in the prevalence of stunting within Ethiopia. The subpopulation data shows that efforts are being made to enhance nutrition to further lower the prevalence of stunting in children. To address the complex linkages between socio-economic, health, environmental, and political issues as causes of stunting in children, integrated government and non-governmental activities are also required.
7	Ngwira, 2020	Malawi	A total of 850 clusters consisting of 173 clusters in urban areas and 677 clusters in rural areas were selected using the probability proportional method.	Cross-sectional study with data analysis using non-parametric	To investigate the relationship between malnutrition and climatic factors such as average temperature and rainfall	Nutritional interventions can target hot spot areas that have shown an increased risk of being overweight. Strategies to minimize malnutrition should focus on the consequences of climate change, including factors such as high rainfall, season length and temperature

According to Adeomi et al. (2022), underweight is more common in rural than in urban areas. The Food and Nutrition Monitoring System put in place in northern Brazil can reduce the incidence of childhood stunting

(Corrêa et al., 2023). The region has an impact on the prevalence of stunting owing to a number of factors, including drought, violence, and disaster susceptibility (Walls et al., 2018). These factors have important

implications for agricultural production, leaving children living in areas vulnerable to food insecurity and malnutrition (Ahmed et al., 2020, 2021). Higher rainfall is often associated with better yields for food crops, which can result in a reduction in acute malnutrition but may also contribute to overweight issue if people overeat (Adha et al., 2021; Ngwira, 2020).

High nutritional problems are influenced by various interacting factors such as poverty, education, and food availability at the household level, which affect low-income families (Adeomi et al., 2022). Research also indicates that there are differences in nutritional status based on body mass index in school located in rural and urban areas (Horiuchi et al., 2018), which is also caused by the state of nutrition, general health, and socioeconomic status (Encalada-Torres et al., 2022). Because the characteristics of stunting in toddlers in rural and urban areas are affected by the mother's education and nutritional expertise, rural areas have a higher proportion of stunting (40%) than urban areas (33%), with mothers in rural areas generally having lower knowledge levels (Lusita et al., 2017). The level of protein consumption is most commonly found to be higher in toddlers from urban areas, compared with rural areas (Corrêa et al., 2023). High economic status is also more prevalent among respondents in urban areas, affecting the food consumption patterns for toddlers, which in turn affects their growth and development (Argaw et al., 2022).

The length of education provided by urban mothers is greater than that in rural areas (Laksono et al., 2022). This could be because mothers of toddlers in urban areas have more opportunities to attend school, compared to those in rural areas. As urban areas are the economic center of the community, it (from an economic point of view) can provide better support for individuals to obtain higher education (Kamiya et al., 2018). In addition, the number of available educational institutions is far greater in urban areas, with shorter distances (Lusita et al., 2017).

Apart from the area where the toddlers live, the culture in the area can also affect the incidence of stunting. Culture is highly influential on food (Gatica-Domínguez et al., 2020). There are diverse food types from different communities and regions. The types of food found in a region can vary according to its culture (Kureishy et al., 2017). For instance, in the Papua region, people consume sago in various forms like papeda, sago cendol ice, and sago cakes (Sianipar et al., 2021). Other cultural influences include the habit of Indonesians consuming rice, so there are many preparations made from rice, such as yellow rice and fried rice (Bella et al., 2020). In South Sulawesi, the Makassar, Toraja, and Bugis tribes have cultural practices of eating with various characteristics, based on their respective beliefs, resulting in different proportion of babies experiencing stunting in the Bugis (85.8%), Makassar (52.5%) and Toraja (23.3 %) tribes (Putriana et al., 2020). Meanwhile, compared to India, their staple food is wheat, leading to the production of wheat-based preparations, such as chapattis (Kumari et al., 2020). Culture has a very large influence on food and food processing in a region (Wijaya, 2019), and depending on the abundant natural resources in the region, such as the abundant of sago trees in Papua. In Indonesia, plentiful rice production has made it a key ingredient in various processed foods (Ibrahim et al., 2021).

Cultural factors, in the form of traditions and parenting habits within the family, contribute to nutritional problems (Sutarto et al., 2022). The ability of parents and other family

members to allocate time, support, and pay attention to meet the physical, social, and mental needs of children during their growth and development is a component of good parenting. (Saputri et al., 2020). Parenting patterns are evident in various aspects such as breastfeeding and complementary feeding, psychosocial stimulation, environmental hygiene and sanitation practices, home health care for sick children, and seeking medical attention. There is also a strong correlation between prelacteal feeding history and incidence of child stunting (Mose and Abebe, 2021). Children who are given pre-lacteal feeding have a 12.21 times higher risk of experiencing stunting compared to those who do not receive prelacteal feeding (Nurbiah et al., 2019). Moreover, there is a substantial correlation between the occurrence of stunting in children between the ages of 24 and 59 months and family habits, such as feeding practices, psychosocial stimulation, hygiene/hygiene practices, environmental sanitation, and use of health services (Beal et al., 2018)

4. CONCLUSION

The findings indicated that the incidence of stunting is higher in rural areas, compared to urban areas. In rural areas, stunting occurs in poor families because of limited food availability and lack of understanding of certain foods consumed by families. In urban areas, patterns of unhealthy snacking habits in children affect the incidence of stunting. In addition, the incidence of stunting is also influenced by chronic infectious diseases and a short maternal stature, leading to the birth of short children. The number of mothers, who experience malnutrition, is higher in rural areas than in urban areas. The incidence of stunting in both rural and urban areas is influenced by young age and level of education of the mother, which has an impact on the pattern of decision-making in the family.

The incidence of stunting can occur if pregnant women do not receive sufficient intake of complementary foods during pregnancy, with various reinforcing factors, such as birth order and mother's income, work demands of pregnant women, poverty, maternal health, and deviations from local cultural norms regarding breastfeeding. There is a clear correlation between culture and the role of food intake in the incidence of stunting. For example, culture influences children's nutritional intake. Food restrictions for pregnant women, even when these foods have high nutritional value, is observed in several areas.

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