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Stunting Policies: A Literature Review of Economic, Social, and Development Contexts

Kebijakan Penanganan Stunting: Sebuah Tinjauan Literatur dalam Konteks Ekonomi, Sosial, dan Pembangunan

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Abstract

Stunting is a serious public health issue with multidimensional impacts on economic and social development, particularly in developing countries. This study aims to review various stunting prevention policies from the perspectives of economics, development studies, and health policy. A systematic literature review was conducted using the Web of Science database, with the keyword "Stunting Policies" applied to articles published between 2004 and 2023. A total of 68 relevant articles were analyzed based on categories including economics, development, health policy, law, and political science. The analysis reveals that effective economic policies such as increasing household income among the poor, improving women's education, strengthening food security, and enhancing access to healthcare and sanitation play a crucial role in preventing stunting. Moreover, development studies emphasize that reducing stunting requires a comprehensive and sustainable approach, focusing on improving public services, empowering women, alleviating poverty, and strengthening infrastructure in underdeveloped regions. These findings underscore the need for inclusive, cross-sectoral, and sustainable policies that consider the broader social and economic context of affected communities.

Keywords

Stunting; Public Policy; Sustainable Development.

Abstrak

Stunting merupakan masalah kesehatan serius yang berdampak multidimensional terhadap pembangunan ekonomi dan sosial, khususnya di negara berkembang. Penelitian ini bertujuan untuk mengulas berbagai kebijakan pencegahan stunting dari perspektif ekonomi, studi pembangunan, dan kebijakan kesehatan. Metode yang digunakan adalah tinjauan pustaka sistematis dengan sumber utama dari basis data Web of Science, menggunakan kata kunci "Stunting Policies" pada artikel yang terbit antara tahun 2004 hingga 2023. Sebanyak 68 artikel yang relevan dianalisis berdasarkan kategori ekonomi, pembangunan, kebijakan kesehatan, hukum, dan ilmu politik. Hasil analisis menunjukkan bahwa kebijakan ekonomi yang efektif seperti peningkatan pendapatan rumah tangga miskin, pendidikan perempuan, ketahanan pangan, serta akses terhadap layanan kesehatan dan sanitasi berperan penting dalam pencegahan stunting. Selain itu, Studi pembangunan menegaskan bahwa pengurangan stunting membutuhkan pendekatan yang menyeluruh dan berkelanjutan dengan fokus pada peningkatan pelayanan publik, pemberdayaan perempuan, pengentasan kemiskinan, serta penguatan infrastruktur di daerah tertinggal. Temuan ini menegaskan bahwa penanggulangan stunting memerlukan kebijakan yang inklusif, lintas sektor, dan berkelanjutan, dengan mempertimbangkan konteks sosial serta ekonomi masyarakat secara menyeluruh.

Kata Kunci

Stunting; Kebijakan Publik; Pembangunan Berkelanjutan.

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1. Introduction

Stunting, or impaired growth, is one of the primary global health challenges, particularly in developing countries. It is caused by prolonged inadequate nutritional intake during the early stages of a child's life, resulting in both physical and cognitive developmental delays. The impact of stunting is far-reaching, affecting cognitive ability, increasing the risk of chronic diseases, and reducing economic productivity in adulthood. Recognizing the significance of this issue, many countries have made efforts to formulate policies aimed at reducing stunting prevalence through various multisectoral approaches. The issue of stunting is not confined to the health sector but is closely intertwined with social, economic, and developmental factors. Therefore, effective policies to address stunting must incorporate holistic approaches involving multiple sectors, such as health, education, nutrition, access to clean water, and sanitation. Many studies highlight the need for synergy between specific nutritional programs and broader policies, including programs to improve social and economic well-being. This comprehensive approach is considered more effective in reducing stunting, particularly in regions with high poverty rates.

In this literature review, we will examine various policies implemented across countries to reduce stunting, focusing on the economic, social, and developmental contexts. Existing research indicates that the most successful interventions combine multisectoral approaches, including increased access to healthcare services, maternal education, and economic support through social assistance programs. One crucial factor influencing stunting policies is social and economic inequality. In many developing countries, income inequality, unequal access to resources, and disparities in public services significantly affect stunting prevalence. In this regard, policies focused on economic redistribution and improving access to basic services such as clean water and sanitation can help reduce these disparities and lower stunting rates.

Numerous studies also show that political conditions and social stability affect the effectiveness of stunting policies. In countries experiencing conflict or political instability, nutritional programs are often hampered by poor coordination among government agencies and limited access to affected areas. Policies designed to address stunting in such regions must consider these specific conditions to ensure that the implemented programs achieve their desired targets. From an economic perspective, agriculture plays a vital role in tackling stunting. Studies show that interventions in the agricultural sector, such as improving food production and access to agricultural resources, can enhance community nutrition and reduce stunting. However, the effectiveness of these policies heavily depends on how well the interventions are designed and implemented on the ground.

Furthermore, several studies emphasize the importance of education in addressing stunting. Maternal education is strongly associated with improved child nutritional status. Programs focused on enhancing education and nutritional literacy among young mothers have proven effective in reducing stunting prevalence, as better-educated mothers are more likely to have a stronger understanding of the importance of adequate nutrition for their children. Sanitation and access to clean water are also key components in efforts to reduce stunting. Many countries have successfully reduced stunting prevalence through programs that improve sanitation infrastructure and provide better access to clean water. Poor environmental conditions can exacerbate malnutrition and contribute to diseases that lead to stunting.

Stunting reduction in developing countries has been the subject of extensive international research, with particular emphasis placed on the effectiveness of nutrition interventions and cross-sectoral policy approaches. Aguilera Vasquez & Daher (2019) Through a systematic review, I found that nutrition-based

interventions and conditional cash transfer policies, including nutritional supplementation, can significantly reduce stunting prevalence. Their findings underscore that stunting reduction policies possess a strategic dimension as a long-term economic development investment, rather than functioning solely as a health intervention.

This perspective is consistent with Sitorus (2024) review, which emphasizes that stunting not only undermines individual health quality but also has direct implications for labor productivity, economic growth, and national welfare. Such evidence reinforces the characterization of stunting as a cross sectoral issue that requires integrated interventions within the framework of public policy.

A systematic review by Aminah et al. (2024) covering publications from 2019 to 2023 in countries across Asia, Africa, and the Americas, revealed that successful stunting reduction is closely associated with the implementation of holistic policies. These policies encompass strengthening food security, decentralizing health systems, ensuring the availability of and access to healthcare services, improving maternal nutrition, expanding access to clean water and sanitation, enhancing maternal education, and implementing poverty alleviation initiatives.

Within the context of health determinants, Nabwera et al. (2021) assert that stunting remains a major public health concern, affecting more than 140 million children worldwide. Its ethology is multifactorial, encompassing poverty, regional development disparities, inadequate sanitation, and the repercussions of the COVID-19 pandemic. They underscore the necessity of implementing Transformative WASH an integrated approach that combines health, nutrition, sanitation, and the management of socio-economic factors to generate more comprehensive and sustained benefits for the most vulnerable populations.

At the community level, Farona et al (2022) identify that the prevalence of stunting in rural areas is heavily influenced by socio economic conditions, including household income, educational attainment, and access to healthcare facilities. Other studies also indicate that community empowerment in rural villages can be achieved through the strengthening of the local economy Hadi et al. (2024). These findings suggest that the success of interventions is contingent not only on national policy frameworks but also on the capacity to tailor programs to specific local socio-cultural contexts.

Although the existing literature demonstrates a strong interrelationship between economic, social, and development policies in addressing stunting, a substantial research gap remains. Most studies have concentrated on the effectiveness of sector-specific interventions such as nutrition programs, health services, or cash transfers without fully examining policy as a central expression of governmental responsibility. Policy plays a strategic role in shaping the economic, social, and developmental factors that influence stunting reduction. The state's role is reflected in how policies are formulated, financed, and implemented to address the structural determinants of stunting, including poverty, inequality, and infrastructural deficits. Consequently, policy analysis is critical for assessing the extent to which current interventions succeed in aligning health objectives with broader economic development goals and sustainable social empowerment.

2. Methods

This study employs a descriptive bibliometric analysis method aimed at reviewing literature related to stunting policies, with a focus on economic, social, and developmental contexts. Bibliometric analysis allows for the examination of scientific publications by identifying trends, publication patterns, and contributions from various academic disciplines on a specific topic. In the context of this research, the method is utilized to evaluate scholarly works relevant to stunting policies over

nearly two decades, from 2004 to 2023. This analysis provides an in-depth understanding of the evolution of stunting literature and the contributions of disciplines such as economics, health, and politics to related policy development.

A comprehensive search strategy was conducted using the Web of Science (WoS) database, one of the leading sources for reputable scientific literature. The selection of WoS as the primary source was based on its completeness, accuracy, and credibility in providing high-quality articles across various disciplines, including economics, development studies, health policy, law, and political science fields directly relevant to the focus of this study. The search keyword used was "Stunting Policies," which directly reflects the core focus of the research, namely policies implemented to address stunting in various contexts. The publication period was set from 2004 to 2023 to capture recent developments in stunting policies while ensuring relevance to the current policy context.

The choice of WoS was also motivated by its strength in providing standardized and verified metadata, facilitating the consistent screening, categorization, and analysis of literature across disciplines. The reliability of its bibliographic data ensures that the literature review process can be conducted systematically and replicated, while minimizing the risk of including non-reputable sources. The search process yielded 68 articles relevant to the research topic, which were then analyzed in depth to identify trends in stunting policies and the contributions of various disciplines to address this issue. Accordingly, WoS is considered the most suitable database for ensuring the quality, accuracy, and comprehensiveness of literature coverage in this study.

The selected articles for this review span multiple academic disciplines, including Economics, Development Studies, Health Policy Services, Law, and Political Science. The inclusion of these categories not only reflects the broad dimensions of stunting policies but also highlights the complexity of the issue, encompassing economic, social, and developmental aspects. Each discipline provides a unique perspective on the issue of stunting, from its impact on economic growth to its legal implications in social and health policies. By employing this approach, the study offers a comprehensive mapping of the literature on stunting policies. The findings from this analysis are expected to provide deep insights into trends, gaps, and contributions of the existing research, and help guide future policies to be more effective in addressing the issue of stunting across different countries and contexts.

3. Results and Discussion

Bibliometric analysis has become a crucial tool in understanding the structure and evolution of scientific research, especially when studying complex issues such as stunting, which involves diverse fields like economics, social sciences, and development studies. Using VOSviewer software, researchers can apply mapping and clustering techniques to better understand the vast body of publications related to stunting policies. In the context of this literature review, both processes mapping and clustering work together to provide an in-depth understanding of how research on stunting policies has evolved over time, particularly within the economic, social, and developmental contexts.

Mapping in bibliometric analysis refers to the visualization of relationships between terms, keywords, or articles. Mapping allows researchers to see how these elements are interconnected, revealing hidden patterns within literature. For example, in a review focused on stunting policies, mapping can uncover the relationships between various policy interventions (such as nutrition programs, health services, or educational initiatives) and stunting outcomes, such as reduced stunting prevalence across countries or regions. Through VOSviewer, mapping is

visualized in graphic form where key terms or important words are represented as nodes, and the relationships between these nodes are shown as connecting lines. The larger the node, the more frequently the term appears in the literature, while the thicker the connecting line, the stronger the relationship between two terms. This approach allows researchers to easily see which terms or concepts dominate research on stunting policies and how the relationships between concepts have evolved.

Clustering, in the context of stunting policies, aims to group related terms based on their frequency and connections within the network of terms. This is useful for identifying dominant research themes in the literature related to stunting policies. For instance, in a bibliometric analysis of stunting policies, clustering might show how nutritional policies are closely linked to economic and social factors, such as household income, maternal education, and access to healthcare services. Clustering also aids in understanding the interrelations between research themes, such as how economic policies that affect household income can impact child health and stunting prevalence. Additionally, clustering can group research addressing the impact of infrastructure development, such as sanitation and access to clean water, on stunting reduction policies. By organizing these themes, researchers can focus on the relationships between different factors in reducing stunting prevalence.

The use of VOSviewer in this study of stunting policies also allows researchers to understand how research trends have developed over a given period. For instance, this analysis may reveal a shift in research focus from basic health interventions to broader multisectoral approaches that involve sectors such as agriculture, education, and the economy. This pattern suggests that stunting is increasingly understood as a problem requiring holistic solutions, not solely health-based interventions. Through mapping and clustering, researchers can map the network of relationships among publications focusing on stunting policies within economic, social, and developmental contexts. Mapping provides a visual overview of how these studies are interconnected, while clustering allows the identification of dominant themes in stunting policy literature. For example, clustering may show how nutrition policies are closely linked to maternal and child health policies and infrastructure development policies, all of which are interconnected in efforts to reduce stunting.

Moreover, clustering can help identify literature that discusses long-term policies to address stunting, such as those focused on economic development or maternal education programs. These studies tend to show that interventions in the economic and educational sectors have a significant long-term impact on reducing stunting prevalence. This is crucial as policies based on sustainable development tend to have broader effects in addressing stunting. In the economic context, mapping shows how research on stunting increasingly involves economic studies, highlighting how income inequality and access to resources impact stunting prevalence. Clustering in this analysis allows researchers to understand how economic factors, such as family income, market access, and economic support, affect the effectiveness of stunting reduction policies.

Overall, the combination of mapping and clustering enables research to present a comprehensive view of how various economic, social, and developmental factors are interconnected in stunting policies. This provides a deeper understanding of the interactions between these factors, which can ultimately help in designing more effective policies to reduce stunting in the future. Using this approach, stunting policy research can make a significant contribution to the development of more targeted public policies. Mapping and clustering enable a clear visualization of the relationships between variables and reveal research gaps that may need to be addressed by future studies. Bibliometric analysis using mapping and clustering

techniques has proven valuable in understanding the development of research related to stunting policies. It offers a visual and structured way to examine the evolution of literature, reveal dominant themes, and uncover potential areas for future exploration. This comprehensive approach ensures that stunting research contributes to more effective and holistic policy interventions, addressing the multifaceted nature of stunting within the contexts of health, economics, education, and infrastructure development.

3.1. Network Visualization

This network visualization reveals several key clusters that address various interconnected themes in the literature on child malnutrition, inequality, and health access. Each cluster, identified by color in the visualization, is closely related to the specific topics discussed by authors in various articles. The Blue Cluster, which highlights issues of child malnutrition and stunting, is a crucial topic in public health development in developing countries. Stunting is a growth disorder caused by chronic malnutrition that affects millions of children worldwide, particularly in regions with high economic inequality. Various articles in this cluster analyze the factors influencing children's physical and cognitive growth and the long-term impacts of malnutrition. One of the key articles in this cluster is (Himaz, 2018) work, which discusses childhood stunting and its effects into adulthood.

Himaz (2018) describe that, "Stunting later in childhood and outcomes as a young adult: Evidence from India", uses longitudinal data from children in India to examine growth patterns and height reductions experienced by children between the ages of 8 and 19. This study emphasizes that stunting has significant impacts on children's physical and psychosocial development and reveals that girls are more vulnerable to stunting during adolescence compared to boys. This gender bias is a critical finding that influences child health and nutrition policies in developing countries. Other studies in this cluster highlight the relationship between access to nutritious food and child growth. An article by (Mary et al., 2020) shows that agricultural aid aimed at supporting education, research, and agricultural policies significantly reduces stunting prevalence. They found that food aid, particularly in conflict areas, has the greatest impact on reducing child stunting.

Additionally, access to health services and sanitation plays a crucial role in preventing stunting. Augsburg & Rodríguez-Lesmes (2018) in their study on India, show that improved sanitation coverage is closely linked to children's height growth, especially among girls. They found that policies aimed at increasing sanitation coverage are not only effective in reducing stunting but also implicitly target improvements in girls' health.Climate change and weather shocks are also significant factors in child stunting. Freudenreich et al. (2022) in their study on Kyrgyzstan, show that extreme weather conditions, such as very cold winters and droughts, significantly increase the likelihood of stunting, particularly among very young children. This research emphasizes the importance of identifying the most vulnerable groups of children to weather shocks to design more targeted policies for reducing malnutrition.

Poor feeding practices and indoor air pollution were also found to significantly impact child growth. (Y. Kim et al., 2023) found that indoor air pollution caused using unclean fuels is closely associated with stunting in Indonesia. Using clean stoves can significantly reduce stunting prevalence. This finding suggests that policy interventions promoting the use of clean fuels are essential for children's health. In Rwanda, Warner et al (2023) proposed a more comprehensive approach to addressing stunting by combining nutrition interventions, food supplementation, and improving food diversity. This study shows that combining short-term and long-

term interventions can sustainably improve nutritional outcomes, although food system changes cannot happen overnight.

The role of policy and international aid in addressing stunting is also discussed by (C. Kim et al., 2020) in their study on Afghanistan. They emphasize the importance of a multisectoral approach that combines specific, context-sensitive nutrition interventions. However, they also highlight the challenges in consistently implementing these policies at the community level, where service coverage is often uneven. Meanwhile, in Guatemala, Rivero Jiménez et al. (2021) conducted a systematic review of initiatives to combat malnutrition and stunting. They emphasize the importance of diverse approaches to tackling malnutrition, including interventions in nutrition, clean water, sanitation, and food security. This study reinforces the idea that solutions to malnutrition must involve multiple sectors and cannot rely on a single type of intervention.

Overall, the Blue Cluster illustrates how stunting in children is a highly complex issue, influenced by many factors, including nutrition, access to sanitation, climate change, and effective policy interventions. A comprehensive approach involving multiple sectors and sustainable policies is critical for addressing this issue in developing countries. The Green Cluster raises the theme of social inequality in access to nutrition, which is closely linked to the prevalence of malnutrition among children in developing countries. Social inequality between wealthy and poor communities, as well as the disparity between urban and rural areas, is the focus of research in this cluster. One example of a study in this cluster is the research by Augsburg & Rodríguez-Lesmes (2018) which shows that better sanitation access is closely associated with reduced stunting in children in India. They found that increasing sanitation coverage significantly reduced stunting, particularly among girls, as girls are more vulnerable to inequities in resource distribution within families.

In many developing countries, access to health services and nutritious food tends to be more readily available to wealthy urban populations compared to those in rural areas. Infrastructure conditions, access to clean water, and sanitation in rural areas are often limited, making children in these regions more at risk of malnutrition. A study by Mary et al. (2020) shows that agricultural aid aimed at supporting education and agricultural research can help reduce stunting prevalence in developing countries. The disparity in access between wealthy and poor groups is also reflected in families' ability to provide healthy and nutritious food. C. Kim et al (2020) in their study in Afghanistan, show that multisectoral interventions in nutrition, including access to healthy food and adequate health services, are crucial for reducing malnutrition rates in conflict-affected countries. This research emphasizes the importance of cooperation between the health, sanitation, and food security sectors to achieve optimal results in reducing stunting.

Conflict and political instability further exacerbate inequalities in access to nutrition. For instance, Rivero Jiménez et al. (2021) highlight the impact of conflict in Guatemala, where political instability worsens the crisis of malnutrition and stunting in children. In conflict situations, the distribution of food aid is often disrupted, making poor families more vulnerable to malnutrition. In many developing countries, awareness of the importance of balanced nutrition and adequate sanitation remains low. Therefore, health and nutrition education interventions are essential for improving public understanding of how to provide healthy food for their children. Warner et al. (2023) in their study in Rwanda, found that combining nutrition education with food supplementation can significantly improve children's nutritional outcomes.

Overall, the Green Cluster highlights the importance of addressing social inequality in access to nutrition and healthcare to reduce malnutrition and stunting

rates among children in developing countries. A multisectoral approach involving health, sanitation, food security, and health education sectors is crucial to achieving this goal. The Red Cluster in the citation network focuses on population access to health rights and regulatory policies, emphasizing the vital role of government regulation and public policy in ensuring that communities have adequate access to basic services such as clean water, sanitation, and nutrition. The articles in this cluster underline how policies supported by strong regulations can play a crucial role in improving public health and nutrition, especially in developing countries still facing infrastructure challenges.

One of the key articles in this cluster is "Multisector nutrition gains amidst evidence scarcity" by C. Kim et al (2020) which discusses how multisectoral policies that combine healthcare, sanitation, and food security can significantly contribute to reducing stunting and malnutrition rates in Afghanistan. In their study, Kim et al. (2020) highlights that while these multisectoral programs effectively improve nutrition, challenges remain in implementation at the community level, such as coordination difficulties between sectors and a lack of resources to reach the most vulnerable populations. In addition, sanitation and clean water policies also play a critical role in this cluster. Mulyaningsih et al. (2023) in their study in Indonesia, show that access to clean water and good sanitation has a direct impact on children's health, including reducing stunting rates. They stress that the government must accelerate the development of sanitation infrastructure in rural areas to ensure equal access for all levels of society. This research supports the importance of long-term investment in basic infrastructure to achieve public health targets.

Fair health policies also include access to quality healthcare services, particularly for marginalized groups. Phelps (2018) in his article on health policy during the Trump era, points out that in developed countries like the United States, equal access to healthcare remains a significant challenge, especially for the poor and minorities. This underscores unequal access to healthcare and basic rights is not only an issue in developing countries but also in developed nations. In developing countries, inadequate regulation is often a significant barrier to achieving equal health rights. Smith & Haddad (2015) in their study on global malnutrition reduction, demonstrate that effective regulation in the provision of clean water, sanitation, and healthcare is crucial for accelerating the reduction of stunting and malnutrition in developing countries.

They emphasize the importance of a comprehensive approach that involves multiple sectors, from health and sanitation to education, to achieve significant improvements in children's nutritional status. Additionally, health policies that integrate sanitation and nutrition programs are also vital for supporting long-term development. According to Rivero Jiménez et al. (2021) in Guatemala, policies focusing solely on one sector, such as nutrition or sanitation, tend to have suboptimal impacts. Instead, broader and more comprehensive programs prove more effective in achieving long-term, sustainable improvements in public health. The study by Warner et al. (2023) in Rwanda also shows that interventions combining food supplementation with dietary diversification programs yield better results compared to single approaches. This study highlights that government policies must consider a comprehensive and integrative approach to achieve sustainable improvements in nutrition and health, particularly in countries still facing food security and health challenges.

Multisectoral policies that integrate healthcare, sanitation, and education can also help developing countries address the challenges posed by climate change and social instability. Y. Kim et al. (2023) in their study on indoor air pollution in Indonesia, show that government interventions to reduce household air pollution through the promotion of clean fuel use can significantly reduce stunting rates. This

shows the importance of regulations that support both environmental health and public health. Moreover, a multisectoral approach involving sanitation, healthcare, and nutrition education policies is crucial for addressing health disparities in developing countries. According to a study by Masters et al. (2018) on agricultural transformation and food policies in Africa, policies that focus solely on increasing food production are insufficient to address nutrition issues. Instead, these policies must be integrated with health and education programs to achieve better results in reducing malnutrition rates.

Overall, the Red Cluster emphasizes the importance of strong government regulations and cross-sectoral policy integration to ensure equitable access to basic services such as clean water, sanitation, and healthcare. A comprehensive and multisectoral approach is key to achieving long-term improvements in public nutrition and health in developing countries. Lastly, the Yellow Cluster highlights the impact of global crises such as COVID-19. The COVID-19 pandemic has had a significant impact on inequalities in access to nutrition, especially in vulnerable regions such as Rajasthan, India. In the article titled "COVID-19's Shadow on Undernourished Children" by (Sadhu & Gandhi, 2020) the pandemic's impact on malnourished children takes center stage. In Rajasthan, the pandemic worsened the nutritional condition of already vulnerable children due to limited healthcare infrastructure and access to nutritious food.

The pandemic has affected all aspects of life, including the health of children aged 6-23 months. This research shows that, although Rajasthan already had high rates of malnutrition before the pandemic, the global health crisis exacerbated these conditions. Mobility restrictions, reduced access to healthcare services, and disruptions in food supply chains caused more children to suffer from stunting, wasting, and malnutrition. Furthermore, low-income families were the hardest hit by the crisis. Increased poverty and loss of livelihoods due to lockdowns left many families unable to provide nutritious food for their children. As a result, children from already poor families became further isolated from healthcare and nutritional aid, which should have been a lifeline during such conditions.

The pandemic also highlighted the critical importance of multisectoral policies in addressing malnutrition, especially during global crises. Collaboration between the health, education, and food sectors is essential to minimizing the negative impacts on children who are already vulnerable. This study stresses the need for better regulations to maintain the continuity of nutrition programs during emergencies such as pandemics. Overall, COVID-19's Shadow on Undernourished Children provides deep insights into how the COVID-19 pandemic exacerbated inequalities in access to nutrition and healthcare in Rajasthan. This study also shows that a more comprehensive and integrated approach is needed to address malnutrition during global crises, with a particular focus on poor families and vulnerable children.

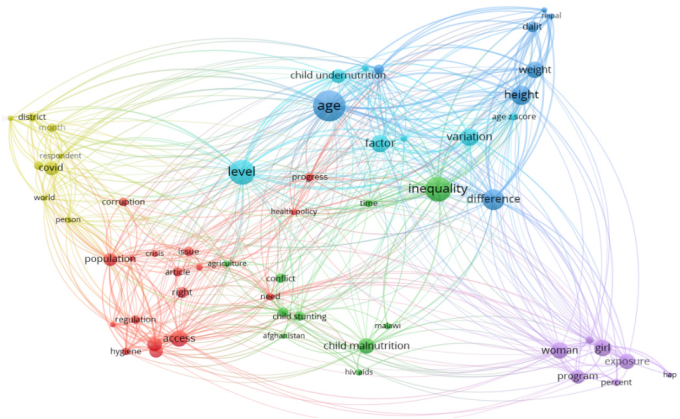

Figure 1. Network Visualization

Source: VOSviewer, 2025

3.2. Visualization Overlay

This overlay visualization illustrates the relationships between various concepts related to malnutrition, inequality, and related factors, especially in the context of the impact of global crises like COVID-19. This analysis discusses the development of these themes from 2012 to 2022, based on the colors and sizes of the nodes displayed. 2012-2014 Period: Focus on Inequality and Access At the beginning of this period, the "inequality" node is large and blue, indicating that this concept dominated discussions during that time. Inequality, particularly in access to healthcare, nutrition, and sanitation, was a primary concern. The connections with nodes like "access" and "population" suggest that unequal access to essential resources was a central topic in various studies.

2014-2016 Period: The Role of Child Malnutrition Factors During this period, nodes such as "child undernutrition" and "age" became more prominent. The light green color of these nodes indicates that discussions around child malnutrition strengthened during this time frame. Studies focusing on the age factor in relation to child malnutrition, such as stunting and wasting, gained more attention. Age was often linked to different stages of child development, with a higher risk of malnutrition in certain age groups. 2016-2018 Period: Increasing Focus on Gender Inequality and Exposure In this period, gender inequality, particularly affecting girls, began to emerge as a key issue. The "girl" and "woman" nodes started to connect more strongly with "inequality" and "exposure." This reflects growing awareness that girls often face a double burden of inequality, both in terms of nutrition and access to healthcare and education. Exposure to pollution, poor sanitation conditions, and malnutrition also became more intense topics of discussion.

2018-2020 Period: The COVID-19 Crisis and Its Impact on Malnutrition In these years, nodes like "COVID" and "crisis" began to appear in yellow, indicating that discussions of the COVID-19 pandemic became highly relevant. The impact of COVID-19 on malnutrition, especially in vulnerable populations, was examined more deeply. This crisis not only worsened existing inequalities but also introduced new challenges in access to healthcare and nutrition. Studies like that of (Sadhu & Gandhi, 2020) highlighted how the pandemic exacerbated the conditions of children already suffering from malnutrition, particularly in areas like Rajasthan, India.2020-2022 Period: Emphasis on Access and Regulation During this period, nodes like "regulation" and "access" gained increasing importance. The yellow color of these nodes indicates a growing focus on regulation to address unequal access. This relates to government efforts and public policies aimed at ensuring fairer access to basic services such as clean water, sanitation, and nutrition. For instance, studies conducted in various developing countries showed that effective regulation can play a crucial role in reducing stunting and malnutrition rates.

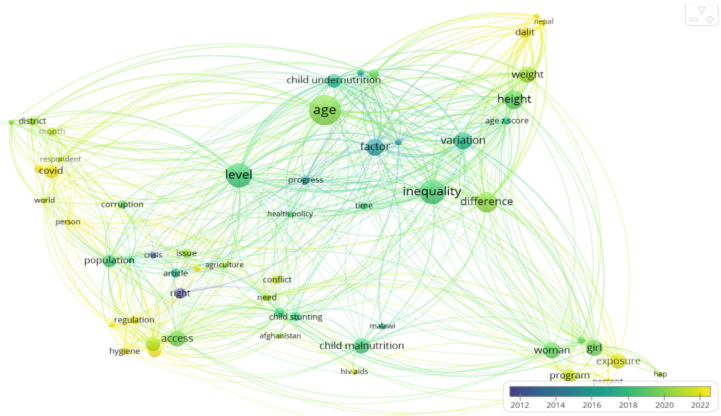

Figure 2. Overlay Visualization

Source: VOSviewer, 2025

Variation and Inequality: Ongoing Discussions Throughout this period, the "inequality" and "variation" nodes remained prominent, indicating that inequality in access and health outcomes continued to be a major issue. The dark green color shows that this concept remains relevant today. Variation in nutritional status among different population groups, such as between the poor and wealthy or between urban and rural populations, has been a deep topic of discussion, especially in the context of child malnutrition. Emphasis on Multisectoral Programs The nodes "program" and "exposure" indicate that by the end of this period, multisectoral programs gained more attention. These programs include integrating healthcare, education, and sanitation as part of a holistic effort to reduce malnutrition. Research shows that programs focused on just one sector do not have as significant an impact compared to programs that involve multiple sectors simultaneously. Overall, this overlay visualization shows how themes such as inequality, child malnutrition, and regulation have evolved over time, with a shift in focus from general inequality towards the impact of global crises like COVID-19 and the importance of integrated multisectoral programs.

3.3. Visualization Density

The density visualization of keywords in this citation network illustrates how several important concepts related to health, malnutrition, and inequality have been mapped over a specific time period. This visualization provides an overview of research focusing on various dimensions of access to nutrition, child health, and social inequality. Node "age" and "child undernutrition": In this visualization, the concepts of "age" and "child undernutrition" appear as primary focuses, with a bright yellow intensity. This indicates that many studies have focused on the impact of age on child malnutrition. A study by Adika (2021) shows that chronic malnutrition often occurs in children exposed to nutritional problems at an early age, and this is closely linked to high rates of stunting in many developing countries.

Node "inequality" and "difference": Inequality is a major concern in this network, as indicated by the large size and prominent color of the node. Research by Smith et al. (2013) highlights the importance of addressing inequality in the distribution of healthcare services to reduce disparities in child health in Bangladesh. This research supports the importance of equitable interventions to reduce stunting and malnutrition. Node "level" and "factor": The visualization also shows a focus on various factors affecting children's health and nutrition levels. A study by Freudenreich et al. (2022) highlights that extreme weather conditions, such as harsh winters, significantly impact stunting levels in children in Kyrgyzstan. Environmental factors, including climate change, have a significant impact on public health.

Node "height" and "weight": Research focusing on height and weight as indicators of malnutrition is also widely discussed. For example, a study in Rwanda by Warner et al. (2023) found that nutrition interventions combining food supplementation and dietary diversification produced significant improvements in children's nutritional status. Node "covid" and "population": The impact of the COVID-19 pandemic on malnutrition and public health is also reflected in this visualization. Research by (Sadhu & Gandhi, 2020) illustrates how the pandemic worsened access to nutrition among children in India, disproportionately affecting vulnerable groups. Node "access" and "regulation": Issues of access to basic services such as clean water and sanitation are major concerns in this network. Mulyaningsih et al. (2023) show that poor access to basic services like clean water is directly correlated with high stunting rates in Indonesia. Government regulations to improve sanitation infrastructure are seen as essential solutions. Node "woman" and "girl": In the context of gender, research shows that women and girls are often the most

vulnerable to malnutrition issues. Augsburg & Rodríguez-Lesmes (2018) found that sanitation policies targeting women and girls in India can positively affect children's growth.

Node "conflict" and "child stunting": Social and political conflict is also closely related to child nutrition issues. A study by Adika (2021) highlights how conflicts in East and Southern Africa contribute to high levels of child malnutrition. Stronger humanitarian interventions are needed to address this issue. Node "sanitation" and "hygiene": The role of sanitation in influencing child health status is also evident in this visualization. Several studies highlight the importance of access to proper sanitation in reducing the risk of diseases that affect child nutrition. Node "agriculture" and "issue": Lastly, agricultural issues and food availability emerge as key elements in discussions about child health. A study in Guatemala by Rivero Jiménez et al. (2021) shows that multisectoral approaches integrating health, sanitation, and food production can help improve children's nutritional status.

By examining this density visualization, we can conclude that issues of child malnutrition, inequality, and access to basic services are interrelated problems that require coordinated policy interventions supported by strong regulations. Additionally, the areas with the lowest density, represented by the dull yellow color, indicate that concepts in these areas are less frequently discussed or less commonly appear in the literature related to malnutrition, inequality, and health access. Node "corruption": This node shows low density, indicating that while corruption is an important factor influencing the distribution of healthcare and resources, this concept may not be directly discussed in the literature analyzed. This could mean that the studies focus more on the technical aspects of nutrition and healthcare distribution rather than the direct impact of corruption on health. Node "progress" and "health policy": Both also show low density, suggesting that while health policy and progress are discussed, these topics may be less dominant in the conversation compared to factors like age, child malnutrition, or inequality. This could reflect a lack of research focusing on how specific health policies impact malnutrition or inequality levels.

Node "hiv aids" and "malawi": Although there is attention to child malnutrition and health in general, the low density of these nodes suggests that research specifically focusing on the impact of HIV/AIDS on malnutrition, particularly in countries like Malawi, is still limited in the analyzed literature. This could indicate a need for further research on the interaction between HIV/AIDS and nutrition issues in countries affected by this health crisis. Node "conflict" and "need": While conflict in many developing countries significantly affects access to healthcare and nutrition, the visualization shows that this topic is less frequently discussed. However, as some studies indicate, conflict does have a major impact on the equitable distribution of nutrition services and access to healthcare, especially in countries experiencing war or instability. Overall, these low-density areas highlight topics that may require further research, particularly in understanding how factors such as corruption, conflict, HIV/AIDS, and health policy affect nutrition and health inequality in various countries.

Figure 3. Density Visualization

Source: VOSviewer, 2025

4. Conclusion

Although this systematic review successfully identified central themes such as inequalities in access to healthcare, sanitation, and nutrition; the impact of the COVID-19 pandemic; and the role of multisectoral programs, several limitations should be acknowledged. First, the review was limited to literature indexed in the Web of Science database, which may introduce potential bias due to the exclusion of publications from other databases that could provide local perspectives and community-based studies. Second, most of the studies analyzed were descriptive or cross-sectional in nature, which poses substantial limitations in establishing causal relationships. Third, the bibliometric analysis employed focused primarily on keywords and inter-topic relationships, meaning that the depth of content discussion for each article depended on the information available in the metadata and the published text reviewed, based on these findings and limitations, future research is recommended to broaden the scope of databases by incorporating literature from additional sources, including regional publications and policy reports, in order to obtain a more comprehensive understanding of stunting and malnutrition policies. Furthermore, evidence-based evaluations are needed to measure the long-term effectiveness of multisectoral programs, particularly in reducing access inequalities among vulnerable groups such as children and women. Given that the COVID-19 pandemic has left lasting structural impacts on health systems and nutrition access, future studies should also explore adaptive strategies to strengthen the resilience of healthcare, sanitation, and nutrition education services during crises. Finally, future research should focus on the development and empirical testing of integrated policy models that align health, economic, and social objectives while addressing structural determinants such as poverty, inequality, and infrastructure deficits. This includes examining mechanisms for cross-sectoral coordination, evaluating the long-term effectiveness and cost effectiveness of multisectoral interventions, and assessing the adaptability of policies to diverse social, cultural, and economic contexts in developing countries.

References

Adika, G. (2021). HIV/AIDS and child malnutrition in eastern and southern Africa. African Development Review, 33(1), 79–90. https://doi.org/10.1111/1467-8268.12505

Aguilera Vasquez, N., & Daher, J. (2019). Do nutrition and cash-based interventions and policies aimed at reducing stunting have an impact on economic development of low-and-middle-income countries? A systematic review. BMC Public Health, 19(1), 1419. https://doi.org/10.1186/s12889-019-7677-1

Aminah, S., Mahmudiono, T., & Nadhiroh, S. R. (2024). Policy, intervention, and management in addressing stunting in children: A systematic review. African Journal of Reproductive Health, 28(10s), 348–357. https://doi.org/10.29063/ajrh2024/v28i10s.37

Augsburg, B., & Rodríguez-Lesmes, P. A. (2018). Sanitation and child health in India. World Development, 107, 22–39. https://doi.org/10.1016/j.worlddev.2018.02.005

Farona, C., Firnawati, A. fristi, & Habibi, M. (2022). Stunting In Children In Rural Related To Socio-Economic Conditions Of Communities. Journal Health Information Management Indonesian (JHIMI), 1(3), 78–81. https://doi.org/10.46808/jhimi.v3i1.77

Freudenreich, H., Aladysheva, A., & Brück, T. (2022). Weather shocks across seasons and child health: Evidence from a panel study in the Kyrgyz Republic. World Development, 155, 105801. https://doi.org/10.1016/j.worlddev.2021.105801

Hadi, S., Marta, A., Muhammad Amin, R., & Febrina, R. (2024). Rural Development in Community Empowerment Through the Governance of Village-Owned Enterprises (BUMDes) Pembangunan Pedesaan dalam Pemberdayaan Masyarakat Melalui Tata Kelola Badan Usaha Milik Desa (BUMDes). Jurnal Ilmu Pemerintahan, 23(1), 121–134. https://doi.org/10.35967/njip.v23i1.702

Himaz, R. (2018). Stunting later in childhood and outcomes as a young adult: Evidence from India. World Development, 104, 344–357. https://doi.org/10.1016/j.worlddev.2017.12.019

Kim, C., Mansoor, G. F., Paya, P. M., Ludin, M. H., Ahrar, M. J., Mashal, M. O., & Todd, C. S. (2020). Multisector nutrition gains amidst evidence scarcity: scoping review of policies, data and interventions to reduce child stunting in Afghanistan. Health Research Policy and Systems, 18(1), 65. https://doi.org/10.1186/s12961-020-00569-x

Kim, Y., Manley, J., & Radoias, V. (2023). Indoor air pollution and child development in Indonesia: Stunted by the smoke? Development Policy Review, 41(6). https://doi.org/10.1111/dpr.12723

Mary, S., Shaw, K., Colen, L., & Gomez y Paloma, S. (2020). Does agricultural aid reduce child stunting? World Development, 130, 104951. https://doi.org/10.1016/j.worlddev.2020.104951

Masters, W. A., Rosenblum, N. Z., & Alemu, R. G. (2018). Agricultural Transformation, Nutrition Transition and Food Policy in Africa: Preston Curves Reveal New Stylised Facts. The Journal of Development Studies, 54(5), 788–802. https://doi.org/10.1080/00220388.2018.1430768

Mulyaningsih, T., Mohanty, I., Gebremedhin, T. A., Miranti, R., & Widyaningsih, V. (2023). Does access to water, sanitation, and hygiene improve children's health? An empirical analysis in Indonesia. Development Policy Review, 41(5). https://doi.org/10.1111/dpr.12706

Nabwera, H. M., Mwangome, M. K., & Prentice, A. M. (2021). Stunting of Growth in Developing Countries (pp. 14–27). https://doi.org/10.1159/000516450

Phelps, E. (2018). America's policy thinking in the age of Trump. Journal of Policy Modeling, 40(3), 509–514. https://doi.org/10.1016/j.jpolmod.2018.02.009

Rivero Jiménez, B., Conde Caballero, D., Pedret Massanet, C., López-Lago Ortiz, L., García Arias, M. A., & Mariano Juárez, L. (2021). Malnutrition, stunting, development and evidence generation in Guatemala: a systematic review. Journal of Development Effectiveness, 13(4), 343–359. https://doi.org/10.1080/19439342.2021.1953567

Sadhu, G., & Gandhi, and H. (2020). COVID-19's Shadow on Undernourished Children (6–23 months): An Evidence-Based Study on Magnitude and its Determinants in Rajasthan. Journal of Health Management, 22(4), 618–629. https://doi.org/10.1177/0972063420983094

Sitorus, N. L. (2024). The Significance of Tackling Stunting for The Economic Prosperity of A Nation – A Narrative Review. Journal of Indonesian Specialized Nutrition, 1(4), 131–137. https://doi.org/10.46799/jisn.v1i4.23

Smith, L. C., & Haddad, L. (2015). Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era. World Development, 68, 180–204. https://doi.org/10.1016/j.worlddev.2014.11.014

Smith, L. C., Khan, F., Frankenberger, T. R., & Wadud, A. K. M. A. (2013). Admissible Evidence in the Court of Development Evaluation? The Impact of CARE's SHOUHARDO Project on Child Stunting in Bangladesh. World Development, 41, 196–216. https://doi.org/10.1016/j.worlddev.2012.06.018

Warner, J., Marivoet, W., Covic, N., & Umugwaneza, M. (2023). Strategies for better integrating nutrient supplementation and dietary diversity approaches for stunting reduction and improved nutrition outcomes: A Rwandan case study. Development Policy Review, 41(4). https://doi.org/10.1111/dpr.12692