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MORALITY BEFORE KNOWLEDGE

Stunting incidence factors based on environmental health and economic status perspectives: A narrative review

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ABSTRACT

Background: Stunting is when a child's height or length is shorter than their age due to chronic malnutrition and repeated infections occurring during the first 1,000 days of life. According to data from the Ministry of Health, Indonesia's stunting rate was 19.8% in 2024, despite the Indonesian government's target of reducing stunting prevalence by 14% by that year. The persistently high prevalence of stunting has profound implications for the Indonesian nation. This study examines the factors contributing to stunting from the perspective of environmental health and economic status in Indonesia. **Methods:** This study used a narrative literature review on method based on previous studies sourced from PubMed, Scopus, Google Scholar, Science Direct, and MEDLINE published from January 2021 to October 2025, as well as reports on the results of the SSGI and SKI data from 2021 to 2024. **Findings:** This study focuses on the multifactorial causes of stunting related to Indonesia's environmental health and economic status. The availability of clean water, inadequate sanitation and latrines, and low economic conditions can cause stunting. Stunting requires a multisectoral strategy focusing on maternal and child nutrition, environmental health, and improving economic status. **Conclusion:** The evidence presented could guide policy development strategies and targeted interventions to prevent stunting, especially from an environmental health perspective, and improve economic status to prevent stunting in Indonesia. **Novelty/Originality of this article:** This study highlights the relationship between stunting incidence factors based on an environmental health and economic status perspective in Indonesia. The narrative review offers a holistic perspective in understanding the complexity of stunting factors and designing more effective intervention strategy policies and guidelines.

KEYWORDS: economic status; environmental health; stunting.

1. Introduction

Indonesia is one of the countries in Southeast Asia with the largest economy compared to other countries. The increasing prosperity of its people and the decline in poverty rates have put Indonesia on the right track to seize the opportunity to provide the best possible life for future generations. However, 2013 data showed that one in three children under five in Indonesia suffers from stunting. Indonesia is among the five countries with the highest number of stunting cases globally. The World Health Organization (WHO) aims to reduce the global prevalence of stunting in children under 5 years of age to below 20% as part of the Sustainable Development Goals (SDGs) (Rokx et al., 2018).

Stunting (low height for age) or chronic malnutrition results from poor nutrition and inadequate health in early childhood, often beginning in the womb. Children who suffer from stunting may never grow to their full height, and their brains may never develop to their full cognitive potential. The Indonesian government aims to reduce the prevalence of

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stunting by 14% by 2024. In 2022, the stunting prevalence rate, based on the Indonesian Nutritional Status Survey/*Survei Status Gizi Indonesia* (SSGI), was 21.6% in Indonesia. Furthermore, the 2023 Indonesian Health Survey/*Survei Kesehatan Indonesia* (SKI) decreased by 0.1% to 21.5%. In 2024, the Indonesian government reduced the stunting prevalence rate to 19.8%, according to the SSGI conducted by the Ministry of Health of the Republic of Indonesia (Ministry of Health Indonesia, 2024).

Figure 1 shows a recent slowdown in the decline of stunting prevalence in Indonesia. In 2023, 1,201,245 children overcame stunting, but 1,209,697 became newly stunted. Based on SSGI 2022 and SKI 2023 data, the prevalence of stunting has increased at the crucial ages of 6 months, 12 months, and 24 months. This pattern reveals a significant failure of current interventions. Urgent, focused action during the First 1,000 Days of Life (HPK) is imperative, and now more than ever, all stakeholders must intensify efforts and collaborate to prevent further stunting.

Table 1. Critical Point of stunting prevalence was increased in 2023

Age	2022	2023			
	Number of children <5 were stunted in 2022	Number of children <5 were stunted from 2022	Addition number of children <5 were stunted in 2023	Decreasion number of children <5 were stunted in 2023	Number of children <5 were stunted in 2023
0-11 months	593,283	N/A*	621,058	N/A*	621,058
12-23 months	1,037,483	593,283	449,839	N/A*	1,043,122
24-35 months	1,213,224	1,037,482	138,800	N/A*	1,176,283
36-47 months	1,042,451	1,213,224	N/A*	147,984	1,065,240
48-59 months	945,155	1,042,451	N/A*	108,109	934,342
>59 months	N/A*	945,155	N/A*	945,155	N/A*
Total	4,831,596	4,831,595	1,209,697	1,201,245	4,840,045

*N/A: Not Available

(Ministry of Health Indonesia, 2023)

According to the 2023 Indonesian Health Survey (SKI), the Indonesian government has revised the stunting-prevalence-reduction target for inclusion in national planning documents. The latest assessment indicates that the 2024 stunting prevalence target of 14% set for the final year of the 2020-2024 National Medium-Term Development Plan/*Rencana Pembangunan Jangka Menengah Nasional* (RPJMN) may not be achieved. In response to regional variations in stunting rates, the government, through National Development Planning Agency/*Badan Perencanaan Pembangunan Nasional* (BAPPENAS) (Fig. 2), has adjusted the national stunting prevalence target for 2025 from 13.5% to 18.8%. This revision is based on a projection to achieve a 5% prevalence rate by 2045, assuming a 25% annual reduction in new stunting cases (BAPPENAS, 2024).

Attaining the national stunting target of 5% by 2045, as mandated by Presidential Regulation 72 of 2021, requires implementing several strategic measures to accelerate stunting reduction. These measures include establishing stunting as a national priority through cross-sectoral coordination, clearly delineating the roles and responsibilities of ministries, agencies, regional governments, and village governments, and executing eight convergence actions as a regional framework. Furthermore, it is essential to strengthen the Stunting Reduction Acceleration Team/*Tim Percepatan Penurunan Stunting* (TPPS) at all administrative levels and to prioritize data-driven planning, budgeting, monitoring, and evaluation.

Despite being distant from the target, the Indonesian government continues to pursue the creation of a golden generation by 2045 by fostering healthy, intelligent, and productive human resources and achieving sustainable development goals through accelerated stunting reduction (Nopirina et al., 2023). Presidential Regulation Number 72 of 2021 provides the regulatory framework for accelerating stunting reduction in Indonesia. These

efforts must be implemented holistically, integratively, and with high quality through coordination, synergy, and synchronization among ministries, institutions, provincial governments, district and city governments, village governments, and other stakeholders (Perpres 72, 2021). Such prevention is essential because the determinants of stunting are complex and multisectoral, necessitating coordinated action at all levels of government.

Fig. 1. Fitting the stunting prevalence target in Indonesia
(BAPPENAS, 2024; BKKBN, 2024)

The purpose of enacting this regulation is that the government believes that stunting not only hinders individual potential but can also reduce the quality of human resources. Presidential Regulation 72 of 2021 states that efforts to accelerate the reduction of stunting are carried out through specific and sensitive interventions. Specific interventions are activities implemented to address the direct causes of stunting by focusing on health programs that directly impact the nutritional status of mothers and infants/children. Sensitive interventions are activities implemented to address the indirect causes of stunting, focusing on development programs outside the health sector that support nutrition and health. Government programs related to sensitive interventions include environmental health, increasing public awareness, food access, and economic well-being (Perpres 72, 2021).

Presidential Regulation Number 72 is effective in providing a framework for reducing stunting through integrated programs and local government teams; however, challenges remain, including community-level issues such as low education, which affects understanding and implementation, as well as variations in regional sustainability (Prayoga, 2024). Community-level understanding can hinder the effectiveness of stunting awareness programs, resulting in a lack of understanding of proper child-rearing practices.

The effectiveness of the regulation depends on strong collaboration between various stakeholders, and challenges in collaborative dynamics can slow down efforts to reduce stunting. There are implementation gaps, as the regulation provides a clear framework; however, ensuring that the implementation details are understood and consistently applied by all implementers across different levels of government remains an ongoing challenge.

Specific interventions, which focus on nutrition and health, are often more effective in reaching their targets than sensitive interventions, which address broader social and economic factors. However, sensitive interventions, such as improved sanitation and access to clean water, are crucial for long-term stunting prevention. Both types of interventions

are most effective when implemented in a coordinated and well-monitored manner. For specific interventions, studies show positive effects on children's feeding practices and maternal knowledge through targeted nutrition education. Sensitive interventions often have lower coverage rates, but their long-term impact on creating a supportive environment for child health is vital (Sari et al., 2024).

Most stunting reduction programs in Indonesia focus on specific maternal and infant/child health interventions. The Indonesian government also needs to focus on prevention in sensitive intervention sectors directly related to environmental health and the community's economic status, which could be affected by stunting. The Indonesian government needs to classify, determine priority targets, identify areas, and increase the coverage of sensitive intervention programs. Based on this background, this study analyzes factors that may influence stunting incidence from an environmental health and economic status perspective through a narrative review. This research enables the development of favorable policies and program guidelines through multisectoral collaboration, adopting a holistic and integrative approach to accelerate stunting reduction in Indonesia.

2. Methods

This study used a narrative review method. A narrative review aims to identify and summarize previously published articles, avoid duplication of research, and identify new, underexplored areas of study (Sukhera, 2022). This method synthesizes information from various sources on the topic of stunting. Journal articles were selected and synthesized for a narrative review. The process included defining research questions, searching for relevant literature, and selecting articles based on quality and relevance. Studies were grouped by theme, findings were compared and contrasted, and results were interpreted narratively to provide a comprehensive understanding rather than a mere summary.

This narrative review was compiled by searching research articles published in PubMed, Google Scholar, Scopus, and Science Direct from January 2021 to October 2025. Websites of scientific organizations, such as WHO, UNICEF, and the Ministry of Health, were also searched. Keywords focused on defining: (1) factors contributing to stunting; (2) causes of stunting; (3) stunting interventions; (4) environmental health; (5) economic status; (6) sanitation; (7) poverty; (8) sensitive interventions; and (9) stunting prevention.

Article screening was based on the primary topic. Inclusion criteria were (1) classified as cohort studies, cross-sectional studies, case-control studies, randomized clinical trials, quasi-experimental studies, and observational studies; (2) published between January 1, 2021, and October 2025, in English and Indonesian; (3) factors affecting stunting; (4) causes of stunting; and (5) national strategies to accelerate stunting reduction. Exclusion criteria were as follows: articles in languages other than English and Indonesian; in vitro studies; animal studies; historical data; and books. This study also utilized data from the Indonesian Nutritional Status Survey (SSGI) and the National Health Survey (SKI) conducted by the Indonesian Ministry of Health from 2020 to 2024. This data analysis was then compiled, and the factors affecting stunting were shown based on perspectives on environmental health and economic status.

3. Results and Discussion

3.1 *Stunting prevalence in Indonesia*

Table 2 shows a 19.8% decrease in stunting prevalence over the past five years in Indonesia, based on the 2024 SKI results (Ministry of Health Indonesia, 2024). However, this reduction is still far from the Indonesian government's 2024 target of 14%. This achievement remains unmet due to the complexity of stunting issues in society. Stunting is not only related to improving nutritional status but must also be accompanied by a healthy environment and a prosperous family economy.

Stunting causes impaired physical growth, increases the risk of disease in children, and impairs brain and intellectual development. Therefore, stunting seriously threatens the quality of life of human resources in Indonesia (Khairani & Effendi, 2020). Children who experience stunting tend to be at higher risk of disease and face difficulties in learning and participating in social activities. The long-term impact of stunting could be affected the productivity and the ability to contribute to economic and social development.

Table 2. Stunting Prevalences based on SSGI/SKI report 2021-2024

Variables	2021	2022	2023	2024
Stunting Prevalences	24.4	21.6	21.5	19.8

(Ministry of Health Indonesia, 2021-2024)

Reducing stunting prevalence is the foundation for improving the quality of human resource development, starting from the first 1,000 days of life (HPK). Fulfilling nutritional needs, environmental support, and a favorable economic status can play a crucial role in addressing dietary issues, particularly in cases of stunting. According to table 2, stunting is unevenly distributed, with provinces like Central Papua, East Nusa Tenggara, and Highland Papua showing the highest prevalence, while other provinces have rates below the national average. Major factors include chronic malnutrition during pregnancy and early childhood, poor nutritional intake, and inadequate sanitation (Ministry of Health Indonesia, 2024).

Table 3. Characteristics of study subjects based on SSGI/SKI report 2023-2024

Variables	2023	2024
Economic Status of Children with Stunting		
Lowest	N/A*	29.8
Lower middle	N/A*	22.4
Middle	N/A*	19.1
Upper Middle	N/A*	17.3
Highest	N/A*	12.1
Proportion of Access to Adequate Household Drinking Water		
No Access	1.2	0.5
Inadequate Access	6.2	5.5
Adequate Access	N/A*	N/A*
Limited Access	3.0	2.5
Basic Access	89.6	91.4
Proportion of Access to Safe Household Sanitation		
Open Defecating (BABS)	3.1	1.7
Closed Defecating (BABS)	5.7	5.0
Inadequate Access	6.8	5.6
Adequate Access	N/A*	N/A*
Shared Inadequate Access	3.4	4.2
Individual Adequate Access	69.4	73.2
Safe Access	11.5	9.3
Proportion of Access to Household Basic Hygiene		
No Access	14.7	N/A*
Limited Access	6.3	N/A*
Basic Hygiene Access	78.9	N/A*

*N/A: Not Available

(Ministry of Health Indonesia, 2023-2024)

Stunting prevalence in Indonesia displays pronounced regional disparities, reflecting deep-rooted inequalities across several critical domains. Socioeconomic status varies significantly between regions, influencing family income, access to nutritious food, and the ability to obtain quality healthcare services. Healthcare and sanitation infrastructure are unequally distributed, with rural and remote areas often facing shortages of medical

facilities, clean water, and proper sanitation. Maternal educational attainment also plays a vital role, as mothers with higher education levels are more likely to adopt healthy child-rearing practices and seek timely medical assistance. Furthermore, geographic determinants such as remoteness, topography, and exposure to natural disasters can restrict access to essential services and exacerbate the risk of stunting.

These disparities reflect inequalities in key areas such as socioeconomic status, healthcare and nutrition, sanitation, maternal education, geography, and local practices. Communities with lower socioeconomic status often struggle with poverty, limiting their ability to provide children with adequate nutrition and health services. Access to healthcare and nutrition varies widely, and many remote or underdeveloped regions lack sufficient clinics, trained health professionals, and programs to address malnutrition. Sanitation facilities are frequently inadequate, increasing the risk of infectious diseases that hinder child growth. Maternal education is another critical factor; mothers with limited education may lack knowledge about proper nutrition, hygiene, and the importance of childhood immunizations. Geographic barriers, such as mountainous terrain or isolated islands, can make it difficult for families to reach health centers or markets with nutritious foods. Additionally, local practices, including early marriage, traditional feeding habits, and resistance to modern healthcare, can further perpetuate stunting in certain regions (Hutabarat, 2025; Rokx et al., 2018).

Based on socioeconomic disparities, stunting is consistently more prevalent in households with lower economic status, which are often concentrated in specific provinces or rural areas. Disparities in family income affect the ability to afford diverse and nutritious food, which is a key determinant of healthy growth.

However, in regions with limited healthcare facilities, access to healthcare and nutrition services is often restricted, and this limitation is associated with higher stunting rates. This includes access to antenatal care (ANC) during pregnancy, iron supplementation tablets for pregnant women, and integrated health services (Posyandu) for children. High-performing provinces like Bali have high coverage of these essential services, and Bali has the lowest prevalence of stunting in Indonesia (Ministry of Health Indonesia, 2024).

Environmental sanitation encompasses the management of the cleanliness of living spaces and the provision of access to clean water sources. In many parts of Indonesia, a lack of access to improved latrines means that many households resort to open defecation or use unhygienic toilet facilities, which further pollute soil and water sources. Untreated drinking water, often collected from rivers, wells, or rainwater without proper purification, exposes communities to harmful bacteria, viruses, and parasites. As a result, children in these environments frequently suffer from waterborne diseases, particularly diarrhea. Recurrent infections, such as diarrhea, not only cause immediate health problems but also interfere with the absorption of essential nutrients, even when food intake is adequate. Over time, this cycle of infection and malnutrition significantly increases the risk of stunting. Furthermore, the quality and availability of water and sanitation infrastructure vary significantly throughout Indonesia. Urban areas may have better facilities, while rural and remote regions often lack access to safe water and effective sanitation services, exacerbating health disparities and contributing to higher rates of stunting among children in those areas. Maternal education and knowledge are among the critical predictors of stunting. Mothers with higher education are more likely to have better knowledge of appropriate childcare, feeding practices (including exclusive breastfeeding and the preparation of quality complementary foods), and hygiene, which directly impact a child's nutritional status (Prasetyo et al., 2023; Rakotomanana et al., 2020).

Geographic and Topographical Challenges are also the most essential factors. Indonesia's archipelagic nature, particularly in regions such as Maluku and East Nusa Tenggara (NTT), presents logistical challenges in delivering health services and distributing resources. Remote areas often face greater difficulties in accessing resources compared to more urbanized and well-connected regions, such as Java and Bali.

Lastly, local culture and practices are also among the factors contributing to the incidence of stunting. In some regions, traditional beliefs and customs heavily influence

dietary choices for pregnant women and young children. Food taboos during pregnancy may lead women to avoid nutrient-rich foods such as eggs, fish, or certain fruits and vegetables, based on the belief that these foods could harm the mother or baby. These restrictions can result in significant nutritional deficiencies during critical periods of fetal development and early childhood. Additionally, traditional childcare practices, such as delayed initiation of breastfeeding or early introduction of complementary foods that are low in nutrients, may further compromise a child's nutrition and growth. In some communities, illness may be treated with traditional remedies instead of seeking modern medical care, which can delay treatment for infections and worsen health outcomes. These cultural norms and practices vary widely across Indonesia's diverse regions, contributing to differences in stunting prevalence between communities.

In essence, stunting disparities across Indonesia reflect uneven development and the varied impact of interconnected social, economic, and environmental determinants. Regions with better access to education, healthcare, and economic opportunities generally have lower rates of stunting, while isolated or economically disadvantaged areas face persistent challenges. Environmental factors, such as frequent natural disasters or limited access to clean water and sanitation, further compound these issues in certain provinces. The complexity of these contributing factors underscores the need for tailored, context-specific interventions. For instance, improving nutrition education for mothers in one region, expanding access to healthcare and sanitation in another, or addressing cultural practices that restrict diet or delay medical care in specific communities. A one-size-fits-all national strategy is unlikely to be effective; instead, successful stunting reduction requires understanding local conditions and implementing targeted solutions that address the unique barriers faced by each community.

Table 4. The Summary of SSGI Report in 2024

Province	Stunting Prevalence (%)	Notes
Bali	8.7%	Lowest rate nationally
West Java	17.1%	Significant decrease from 21.7% in 2023
Riau Islands	15.0%	Low prevalence rate
East Java	14.7%	Low prevalence rate
Riau	20.1	Experienced the largest increase (+6.5%)
West Nusa Tenggara	29.8	Experienced a significant increase (+5.2%)
West Sulawesi	35.4	Experienced a significant increase (+5.1%); generally very high prevalence
East Nusa Tenggara	37.0	Highest prevalence nationally
Southwest Papua	30.5%	Very hight prevalence
Central Papua	32.5%	Highest in 2023
Highland Papua	40.0%	Very hight in 2023

(Ministry of Health Indonesia, 2024)

3.2 Environmental health perspective

Stunting is caused by various factors, both directly and indirectly, influencing child growth through their nutritional status. Some of the leading causes of stunting include inadequate dietary intake, particularly protein, energy, and other essential nutrients; chronic infections that frequently occur during early development; Inappropriate feeding practices, such as providing unbalanced or age-inappropriate food; nutritional needs; poor sanitation and limited access to clean water, which can increase the risk of infection and impaired nutrient absorption; and socioeconomic factors such as poverty, low maternal education, and gender inequality, which also play a significant role in the risk of stunting (Mulyaningsih et al., 2021; Tan et al., 2025). These factors can lead to impaired physical and cognitive growth in children, ultimately stunting (Khoiriyah & Ismarwati, 2023; Kustanto et al., 2024).

The adequacy of access to clean water for daily needs may also influence the increase in stunting prevalence. According to data from the Indonesian Ministry of Health, 5.5% of the population still consumed unsafe drinking water in 2024. Although this figure decreased from 6.2% in 2023, it remains a contributing factor to stunting. Another factor contributing to stunting is inadequate access to latrines or sanitation. According to the 2024 Indonesian Child Health Survey (SKI), 5.6% of Indonesians still lacked adequate latrines (Ministry of Health Indonesia, 2021, 2022, 2023).

In Indonesia, the widespread lack of access to clean water, proper sanitation, and adequate latrine facilities is a crucial indirect cause of stunting in children, particularly in rural and remote areas where infrastructure is limited. Many families must use water from rivers, wells, or rainwater that is often contaminated with bacteria, viruses, and parasites due to insufficient water treatment and environmental sanitation. The absence of reliable Water, Sanitation, and Hygiene (WASH) services makes it difficult for households to maintain basic hygiene practices, such as regular handwashing and safe food preparation, fostering the spread of waterborne illnesses like diarrhea, cholera, and typhoid. Open defecation and the use of unsanitary latrines further pollute the environment and water sources, creating a vicious cycle of contamination and disease. Children, whose immune systems are still developing, are especially vulnerable to these repeated infections, which disrupt the absorption of essential nutrients—even when their diets appear nutritionally adequate—and impede their physical growth and cognitive development. Numerous studies in Indonesia have demonstrated that the prevalence of stunting is substantially higher in communities lacking improved WASH infrastructure, underscoring the urgent need for targeted investments in clean water, sanitation, and hygiene education to break the cycle of infection, malnutrition, and stunted growth.

Unsanitary living conditions and contaminated water sources lead to a higher incidence of diseases such as diarrhea and intestinal worm infections in children. Frequent or recurrent infections can prevent the proper absorption of essential nutrients for growth, leading to malnutrition and stunted growth. The constant presence of pathogens from poor sanitation, including open defecation, causes gut inflammation (environmental enteric dysfunction) that hinders the body's ability to absorb nutrients even with adequate food intake (Shrestha et al., 2020).

Several studies have been conducted in Indonesia, demonstrating a link between improved drinking water, sanitation, and reduced stunting. Another recent study in Indonesia found that children living in communities with better sanitation and lower rates of open defecation in the first two years of life were less likely to experience stunting and underweight (Nadeem et al., 2024; Suciyanti et al., 2021; Wicaksono et al., 2021). One study reported that children in households with high-risk sanitation had a 16 times greater risk of stunting compared to those with low-risk sanitation. Another study found that respondents whose water source for sanitation did not meet the requirements were 5.78 times more likely to be stunted. The risk of stunting was significantly reduced with the availability of proper latrines and clean water. Children from households with both unimproved latrines and untreated drinking water are at an increased risk of stunting. Poor sewage and waste management are also strongly associated with higher stunting rates. Poor hygiene behaviors, such as not washing hands with soap, are associated with a higher risk of infections and stunted growth (Badriyah & Syafiq, 2017).

Recognizing this critical link, the Indonesian government has integrated WASH interventions as a "sensitive intervention" (addressing indirect causes) within its national strategy to accelerate stunting prevention, aiming to reduce the national stunting prevalence. Community-Based Total Sanitation (Sanitasi Total Berbasis Masyarakat or STBM) programs are key community-based approaches that address these issues by promoting improved sanitation and hygiene behaviors. Overall, improving access to clean water, providing proper sanitation facilities (such as latrines), and promoting good hygiene practices are essential public health measures for preventing stunting in Indonesia.

3.3 Economic status perspective

In Indonesia, the prevalence of stunting is high, at 29.8%, particularly among people with low economic status (Ministry of Health Indonesia, 2024). This can make it difficult for people with low economic levels to meet their nutritional needs. In low-income countries, the prevalence of stunting is typically higher due to issues with access to good-quality food, limited access to necessary health facilities, and widespread poverty that hinders the environment from supporting optimal child growth.

Furthermore, stunting prevalence is influenced by socioeconomic status, such as per capita income, poverty, urban slum dwelling, access to electricity, the largest non-ground floor area, and access to clean water. However, this study's results indicate that these factors' influence on stunting prevalence is only occasionally significant and can vary depending on the circumstances and conditions in each region. Although these socioeconomic factors do not always correlate substantially with stunting prevalence, they remain crucial in Indonesia's efforts to prevent this condition (Baliwati & Rusyda, 2025). The low economic status is a significant risk factor for stunting. Stunting is a chronic nutritional problem that arises from prolonged malnutrition, which is strongly linked to a household's inability to meet adequate nutritional needs and access quality healthcare services due to financial constraints (Septiani et al., 2023).

Stunting could impact Indonesia's economic status by reducing long-term productivity, exacerbating poverty, and potentially lowering the country's national GDP. Studies estimate significant economic losses due to stunting, ranging from billions of dollars nationally, and potentially causing a decline in GDP per capita. While economic growth is important, its uneven distribution and lack of focus on nutrition are factors that can exacerbate stunting, creating a cycle where poverty and poor nutrition perpetuate each other (Suryana & Azis, 2023).

Children from low-income households face a significantly higher risk of stunting compared to those from higher-income families. Studies show that families with income below the regional minimum wage/*upah minimum regional* (UMR) have a higher percentage of stunted children. Low family income directly affects the ability to purchase sufficient quantities and a diverse range of nutritious food, especially animal-source foods, which are crucial for early childhood development (Kustanto, 2018).

Additionally, lower economic status often translates to poor access to quality healthcare and sanitation facilities. For example, stunted families are less likely to have health insurance or utilize existing services when needed. Moreover, stunting can perpetuate poverty itself. Children who are stunted often experience impaired physical and cognitive development, leading to lower educational achievement and reduced productivity and income as adults (up to a 20% reduction in income). The national economy is also affected. Indonesia faces significant economic losses due to stunting, estimated to be equivalent to 0.89-3.99% of the total GDP in 2021. Stunting can hinder overall economic growth and labor productivity. Mostly, the problem is often concentrated in areas with higher poverty rates, such as regions outside Java, including Nusa Tenggara, the Moluccas, and Papua.

In this issue, economic status is a primary determinant of stunting prevalence in Indonesia, as families with limited financial resources often face significant barriers to providing adequate nutrition, healthcare, and a healthy living environment for their children. Low-income households may lack the means to purchase diverse and nutrient-rich foods, resulting in monotonous diets that fail to meet the nutritional requirements necessary for healthy growth and development. In addition, families with lower economic status frequently have reduced access to quality healthcare services, including regular checkups, disease prevention, and treatment for childhood illnesses. The inability to afford proper sanitation facilities and clean water further increases children's susceptibility to infections that can impede nutrient absorption. In turn, stunting has a profound negative impact on future economic development at both the household and national levels. Stunted children are at higher risk of experiencing delays in cognitive development and lower

educational attainment, which can limit their employment opportunities and earning potential as adults. At the national level, a high prevalence of stunting in the population can lead to a less productive workforce, increased healthcare costs, and slowed economic progress, perpetuating the cycle of poverty and underdevelopment.

3.4 Specific intervention and sensitive intervention

Indonesia has made notable progress in reducing stunting over recent years, as demonstrated by the decline in the national prevalence rate to 19.8% in 2024. This achievement reflects a concerted effort on the part of the government, which has implemented a comprehensive national strategy targeting the multifactorial causes of stunting. The strategy includes specific interventions, such as improving maternal and child nutrition, providing micronutrient supplementation, promoting exclusive breastfeeding, and ensuring timely immunization, all aimed directly at reducing stunting in children under five. In addition to these targeted measures, the strategy also encompasses sensitive interventions that address underlying determinants, such as improving access to clean water and sanitation, enhancing household food security, expanding access to quality healthcare, and increasing education and awareness among parents and communities. Despite these advances, there are still disparities in implementation coverage across different regions, with some provinces and districts lagging behind due to infrastructural, economic, or logistical challenges. As a result, continued efforts are needed to ensure that all communities benefit equally from these interventions and that progress is sustained nationwide.

Specific interventions are direct nutrition and health actions, primarily targeting the first 1,000 days of life, and account for about 30% of stunting reduction efforts. The average coverage of specific interventions was relatively high in priority districts (more than 70%), which is higher than that of sensitive interventions (Rahmawati & Harahap, 2022).

There are some specific intervention programs, supplementary feeding for wasted children and pregnant women with chronic energy deficiency (CED), which were the only indicators that consistently reached their set targets (over 90% coverage). Nutrition education for health agents and mothers of toddlers has showed positive outcomes, resulting in enhanced knowledge and improved feeding practices. The Ministry of Health focuses on 11 key specific interventions, including iron-folic acid supplementation, deworming, and breastfeeding counseling.

Despite the high average success rate of programs for specific interventions, there are notable disparities in the achievement of individual targets at the local level. Of the 11 specific interventions designed to address stunting—including the provision of iron and folic acid supplements to pregnant women, growth monitoring, exclusive breastfeeding promotion, complementary feeding for infants, immunizations, deworming, and management of acute malnutrition—only a few reached their intended coverage rates in certain districts and provinces. This inconsistency highlights challenges such as insufficient resources, gaps in health worker training, logistical difficulties in reaching remote or underserved populations, and varying levels of community engagement and awareness. As a result, while the overall program may show a high average success rate, the uneven implementation of these critical interventions across all priority programs limits their effectiveness and underscores the need for targeted efforts to strengthen program delivery in lagging areas.

Furthermore, sensitive interventions address the underlying causes of stunting through multi-sectoral programs, such as improving water, sanitation, and hygiene (WASH), food security, and early childhood education. These interventions account for approximately 70% of the efforts aimed at reducing stunting. Coverage of sensitive interventions generally remains lower than that of specific interventions (Andriani et al., 2025).

At this point, the government has emphasized program convergence, involving 23 ministries and agencies, to ensure services reach target households effectively. A strong

political commitment at both national and local levels has led to improved coordination and resource mobilization for sensitive programs. Campaigns for behavior change, especially regarding sanitation and hygiene practices, are ongoing and considered a long-term process.

However, there are some challenges in this intervention. All sensitive intervention indicators in evaluated districts had not reached their targets as of a 2021 report, highlighting significant gaps. Behavior change, a crucial component of sensitive interventions, requires sustained and concerted effort across all levels of society. Operational bottlenecks, such as limited resources (funds, labor, infrastructure) and varying community participation, pose significant barriers to scaling these interventions effectively. Overall, while Indonesia has demonstrated a strong political commitment and a declining national stunting rate, the full potential of both specific and sensitive interventions has yet to be realized due to inconsistencies in service delivery and coverage across all regions and program indicators.

3.5 Implementation of Presidentila regulation number 72 of 2021

Presidential Regulation Number 72 of 2021 concerning the Acceleration of Stunting Reduction states that two types of interventions can be implemented. First, specific interventions include activities by stakeholders and the community to address stunting. Specific interventions are stunting prevention processes carried out directly on target groups such as pregnant women, breastfeeding mothers, and children aged 0-23 months. Secondly, sensitive interventions focus on improving a family's quality of life, particularly concerning environmental conditions and economic status.

Presidential Regulation (Perpres) No. 72 of 2021 has facilitated national efforts to reduce stunting, contributing to a decline in the national prevalence rate of stunting. However, achieving the ambitious target of 14% by the end of 2024 remains challenging, with evaluations highlighting both successes and significant implementation bottlenecks. Although Indonesia's national stunting prevalence has decreased since the regulation's implementation, showing a positive trend and a direct impact of the accelerated programs guided by the regulation, improvement is still needed in all sectors.

The regulation is a comprehensive framework. The regulation provides a strong legal and institutional framework for accelerating stunting reduction, emphasizing a multisectoral approach with five main pillars: leadership commitment, communication for behavior change, convergence of specific and sensitive interventions, food and nutrition security, and robust data/monitoring systems. The policy also led to the formation of Acceleration of Stunting Reduction teams at central, provincial, district, and village levels, improving coordination among various stakeholders (government agencies, BKKBN, health offices, etc.). The regulation underpins programs such as supplementary feeding, nutrition education for pregnant women and families, improved access to sanitation, and integrated health services, which have yielded positive results in various regions.

In contrast, the target of reducing stunting to 14% by 2024 is highly ambitious and generally viewed as difficult to attain, as annual reduction rates have not consistently met the required pace. In several regions of Indonesia, inconsistent implementation has been found. Effectiveness varies significantly by region. Some areas show substantial progress, while others struggle with increasing rates or slow progress due to local challenges like limited transportation access in remote areas, resource constraints, and data inconsistencies between local departments.

Challenges in implementation arise from several interconnected issues. Inefficiencies in budget allocation can result in delays or shortages of resources needed for stunting prevention programs, making it difficult to provide consistent services and supplies across regions. Human resource limitations, such as a shortage of trained healthcare workers or high turnover rates, can impede the delivery of interventions and reduce the quality of care and outreach activities. In some communities, cultural barriers or reluctance to adopt recommended health practices, such as exclusive breastfeeding, immunization, or the use

of modern sanitation facilities can limit the acceptance and effectiveness of prevention measures. Additionally, discrepancies in stunting prevalence data and identification of families at risk of stunting between different local government agencies, such as the Health Department and BKKBN, create challenges for accurate monitoring, targeting, and evaluation of interventions. When agencies use different data sources or definitions, it becomes difficult to coordinate efforts, measure progress, and address gaps effectively, ultimately reducing the overall impact of stunting reduction initiatives.

In conclusion, Perpres No. 72 of 2021 represents a significant milestone in Indonesia's commitment to reducing stunting rates nationwide. This presidential regulation established a clear mandate and comprehensive policy framework, integrating stunting prevention and reduction into national and local development agendas. It set out specific roles for various ministries, local governments, and community organizations, and introduced mechanisms for multi-sectoral coordination, budgeting, and program monitoring. As a result, Indonesia has witnessed a notable decline in stunting prevalence since its adoption, reflecting the positive impact of a unified and strategic approach. However, the policy's full effectiveness has been limited by persistent implementation challenges, including disparities in resource allocation, variations in local government capacity, and gaps in infrastructure and human resources—especially in remote or underserved regions. Additionally, differences in community engagement, cultural acceptance, and the quality of data collection and reporting further hinder the uniform application of interventions. These ongoing challenges highlight the necessity for more targeted, context-specific strategies, sustained financial investment, capacity building at the local level, and robust monitoring and evaluation systems to ensure that the benefits of the policy reach all children and families across Indonesia, ultimately achieving the national stunting reduction goals.

3.6 Further challenges of accelerating stunting reduction in Indonesia

Challenges in accelerating Indonesia's stunting reduction include health sector issues such as poor coordination and weak implementation of programs, environmental challenges like inadequate access to sanitation and clean water, and economic status challenges like insufficient funding, budget allocation disparities between regions, and low household purchasing power for nutritious food. Poor communication, insufficient resources, lack of local government support, and inadequate data monitoring further hinder progress across all sectors.

Firstly, for specific intervention programs, disparities persist in the availability and affordability of health services, particularly in rural and remote areas, hindering access to crucial prenatal and postnatal care (Dadi et al., 2021). Low levels of maternal education and poor maternal health are significant risk factors. There are challenges in effectively communicating health and nutrition information to mothers due to social and cultural factors, as well as a lack of consistent communication programs. Suboptimal practices, such as a lack of exclusive breastfeeding and insufficient dietary diversity for young children, persist. Ensuring access to diverse and nutritious food, even in households with stable employment, remains a persistent challenge. The high prevalence of infectious diseases, often linked to poor sanitation and hygiene, contributes to malnutrition and stunting by impairing nutrient absorption.

According to sensitive intervention programs, a primary environmental challenge is inadequate access to clean water and proper sanitation facilities. Many areas still practice open defecation, and achieving Open Defecation Free (ODF) status in all villages remains a significant hurdle (Odagiri et al., 2017). In unhealthy living conditions, substandard dwelling conditions, and exposure to environmental pollutants, such as toxic air, can negatively impact child development and exacerbate malnutrition. Furthermore, the lack of robust water and sanitation infrastructure, particularly in Eastern Indonesia and rural regions, is a significant barrier to improving environmental health outcomes.

In the economic status part, low household income is a strong determinant of stunting, as it limits a family's ability to afford sufficient nutritious food and quality healthcare.

Stunting traps generations in a cycle of poverty, as it leads to reduced productivity and income in adulthood. While social assistance programs exist, challenges remain in accurately identifying and reaching the intended recipients, limiting their effectiveness in reducing stunting. Despite national targets, there are disparities in budget allocation and a lack of consistent financial commitment at the local government level, with regional autonomy sometimes leading to varied priorities. Stunting itself results in significant potential economic losses for the country (estimated at 0.89-3.99% of GDP), which further constrains resources available for prevention and intervention programs (Wulandari et al., 2025). To optimize the implementation of the stunting prevention program in Indonesia, both the government and the community must engage in a convergent, multi-sectoral, and integrated approach. The government must focus on policy, resource allocation, and service delivery, while the community must drive behavior change and active participation at the local level.

The government's role is to provide a strong framework and resources for the program through national and local leadership. Strengthen political commitment and coordination to ensure strong leadership from national to village levels to mobilize resources and focus efforts on stunting reduction. This includes involving 23 ministries/agencies and local governments in a coordinated effort. The government also has to optimize budget allocation, which refers to the optimal use of the budget across all related ministries and institutions, and allow the use of Village Funds and Special Allocation Funds/*Dana Alokasi Khusus* (DAK) specifically for stunting interventions. Transparency in budget use, involving the community and NGOs, is also important for accountability. Improve access to essential services to expand access to quality health services, clean drinking water, and proper sanitation facilities (WASH). Strengthen the data system to accurately monitor stunting prevalence and utilize this data for evidence-based planning, budgeting, and evaluation. Enhance the involvement of professional health workers and provide ongoing, high-quality training for community health workers (*cadres*), who are the frontline of program delivery. Ensure the expansion and well-targeted distribution of social assistance and fortified food programs (e.g., eggs, chicken, milk) to poor and at-risk households. Develop a comprehensive National Behavior Change Communication Strategy (StraCom) to improve public awareness of stunting and change practices related to health and care, particularly within the First 1000 Days of Life (HPK).

Collaboration with the community is also essential for the program's success, particularly in facilitating behavior change and local implementation. Established a local forum to involve representative and active community members in village meetings for program planning, decision-making, implementation, and evaluation to ensure programs are relevant to local needs. Recognize and support cadres who deliver nutrition education and monitor child growth and development through home visits and screening activities at Posyandus (community health posts). Improve family practices, such as exclusive breastfeeding for at least six months, providing diverse complementary feeding (MP-ASI), and improving personal and environmental hygiene. Actively participate in health services, including maternal nutrition counseling for pregnant women and ensuring full immunization for children. Participate in local collaboration efforts, such as "foster father" programs, where community members or philanthropists donate funds to provide nutritious food for children at risk. Utilize local communication media and community leaders to enhance understanding of proper nutrition, particularly the importance of animal protein intake in preventing stunting.

Accelerating the reduction of stunting is a critical, foundational investment in national development. This approach directly addresses mental health and environmental disparities, advances social justice, and yields long-term developmental benefits. Reducing stunting enhances cognitive capacity, increases economic productivity, and lowers healthcare expenditures. In contrast, unaddressed stunting limits human resource potential and poses risks to sustained economic growth.

From a health equity perspective, stunting disproportionately affects vulnerable populations. Interventions targeting stunting reduction, such as those implemented during

the First 1,000 Days of Life, ensure that all children, irrespective of socioeconomic status, can access fundamental rights to adequate nutrition, clean air, and equitable healthcare. Moreover, stunting is a multidimensional challenge involving factors such as parenting, nutrition, and sanitation. Accelerating stunting reduction, especially among low-income families, constitutes a form of social justice by disrupting the intergenerational cycle of poverty and promoting equal opportunities for optimal development.

In the context of long-term development, accelerating stunting reduction enhances the quality of human resources, fostering a generation with improved physical and intellectual capacities. This progress contributes to increased Gross Domestic Product (GDP) and supports the attainment of national development objectives.

Therefore, stunting prevention is a top priority for the Indonesian government to improve the quality of Indonesian human resources towards the golden generation of 2045 through a holistic and collaborative approach between the government, the community, and other stakeholders by working together in achieving sustained reductions by using a policy brief as a guideline to combat stunting. Preventing stunting is not only an investment in children's health, but also an investment in a nation's future economic growth and well-being.

4. Conclusions

This narrrative review has explored the issue of stunting from the perspectives of environmental health and economic status. Stunting is not solely caused by child malnutrition; environmental health and a family's well-being are complex issues that must be addressed. Within environmental health, the quality of clean water sources for daily living, healthy latrines, and a family's hygiene can help prevent stunting. Meanwhile, a healthy economic status can help a family meet the nutritional needs of their children and ensure a better future for them. The government needs to focus on each intervention, both specific and sensitive. In this study, stunting reduction focuses on perspectives on environmental health and economic status.

The government needs to strengthen related aspects, such as providing clean water and sanitation, providing adequate latrines, and improving economic well-being through business capital assistance and skills training to enhance skills for the workforce. Intervention strategies can be implemented by developing policies based on a multisectoral approach that emphasizes the integration of improvements in nutrition, environmental health, and economic status into a broader policy framework at the regional and national levels, as well as the importance of a robust monitoring and evaluation system. In the future, further research is needed, particularly on implementing existing government priority programs to accelerate stunting reduction in Indonesia. This research is necessary for monitoring and evaluation to ensure that each program can operate more optimally in addressing stunting in Indonesia.

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