THE IMPORTANCE OF MICRONUTRIENT INTAKE IN STUNTING PREVENTION: A CRITICAL ANALYSIS

Dewi Setiyawati[1*], Sri Wahyuni[2], Nita Andriani Lubis[3]
[1,2,3]Politeknik Kesehatan Kementerian Kesehatan Medan
Email : *rumahyunikreatif@gmail.com,*

ABSTRACT

The importance of micronutrient intake in preventing stunting is the main focus in this critical analysis. Stunting, as a global child health issue, requires a holistic approach that not only involves nutritional aspects, but also socio-economic factors. This analysis looks at the prevalence of stunting in Indonesia, highlighting regional inequalities and socio-economic factors as significant contributors. The long-term impact of stunting on economic productivity drives the urgency of investing in prevention. The main aim of this research is to provide an in-depth analysis of the role of micronutrients, such as iron, vitamin A and zinc, in the context of stunting prevention. The research method involved a literature review to explore the complex relationship between micronutrients and child growth. The results suggest that a deep understanding of the role of micronutrients is key to designing effective interventions. This research contributes to a deeper understanding of the impact of micronutrients on child growth, motivates further discussion, and provides the basis for more effective stunting prevention policies.

Keywords *: Micronutrient Intake, Stunting Prevention, Intervention*

INTRODUCTION

In recent years, stunting has attracted global attention as an urgent health issue. Data from the World Health Organization (WHO) shows that more than 149 million children under the age of five experienced stunting in 2020 (WHO, 2021). This figure reflects the significant scale of the problem and shows that stunting is not only a local problem, but is also spreading throughout the world. This fact illustrates the urgency of addressing the problem of stunting, considering its impact on the quality of life and development of children.

Based on the 2020 Global Nutrition Report, stunting is closely related to low nutritional status, especially deficiencies in essential nutrients such as iron, vitamin A and zinc. Children who experience stunting tend to have a high risk of infectious diseases and have delays in cognitive and physical development (Micha, 2022). This data shows that stunting is not just a problem of

inadequate nutrition, but also illustrates its relationship to a number of complex factors, including access to quality food sources and adequate health care.

Recent research from the Food and Agriculture Organization of the United Nations (FAO) presents the fact that socio-economic factors, such as the mother's education level and family economic status, also contribute to high stunting rates (United Nation, 2021). Children who come from families with low levels of education tend to be more vulnerable to stunting. Therefore, a holistic approach in designing stunting prevention programs needs to consider not only nutritional aspects but also social and economic aspects.

Not only that, data from UNICEF highlights the long-term impact of stunting, especially in terms of a country's economic productivity. Children who experience stunting are likely to experience reduced productivity as adults, resulting in a significant economic burden for society and the country (UNICEF Indonesia, 2022). Therefore, investing in stunting prevention is not only a public health imperative but also a long-term economic development strategy.

Seeing the complexity of the stunting problem, a deep understanding of the underlying factors is key to formulating effective solutions. By exploring supporting data and facts, it is hoped that global efforts to overcome stunting can be more focused, evidence-based, and can have a real positive impact on future generations.

Data and facts related to stunting in Indonesia provide an in-depth picture of the severity of this problem at the national level. According to the 2022 Indonesian Demographic and Health Survey (SDKI), the prevalence of stunting in children under five years of age reached 30.8% (USAID Indonesia, 2022). This figure indicates that almost a third of children in Indonesia experience suboptimal growth problems. This data also shows inequality between regions in Indonesia. Stunting tends to be higher in rural areas (33.8%) compared to urban areas (27.3%). This disparity illustrates the main challenge in providing equitable access to health and nutritional resources throughout Indonesia (United Nations Children’s Fund (UNICEF), 2020).

In addition, according to the 2020 Global Nutrition Report, Indonesia is included in the group of countries with high levels of stunting, and is recorded as one of the countries with the highest absolute number of stunted children in the world (United Nation, 2021). The factors that contribute to the high prevalence of stunting in Indonesia involve various aspects, including the low practice of exclusive breastfeeding, lack of access to a variety of nutrition, and high levels of infection which can affect children's growth.

In addition, a report from the Indonesian Central Statistics Agency (BPS) highlights socio-economic factors as an additional cause of high stunting rates (Micha, 2022). Families with low levels of education and poor economic status tend to have a higher risk of stunting in their children. This data provides a deeper understanding of the complexity of the stunting problem in Indonesia, and shows the need for a holistic approach involving multidimensional factors.

Investment in research and stunting prevention programs in Indonesia is very important considering its long-term impact on public health and national development. By extracting related data and facts, it is hoped that efforts to prevent stunting in Indonesia can be more focused, in line with the needs of each region, and produce significant positive changes in the level of children's health throughout the country (United Nations Children's Fund (UNICEF), 2020).

In this context, research and analysis related to micronutrient intake in preventing stunting is becoming increasingly important. Although scientific literature has provided insight into the relationship between nutritional status and stunting, more in-depth research is still needed to explore the complexity of interactions between micronutrients and child growth (Andriani *et al.*, 2023; Thahir *et al.*, 2023). This means that a critical analysis needs to be carried out to understand how micronutrient intake, such as vitamins and minerals, can influence children's growth more specifically (Alioma, Zeller and Ling, 2022; Paramashanti *et al.*, 2022).

The rationale for writing this article was driven by the need to provide a more in-depth analysis regarding the role of micronutrients in preventing stunting. While the scientific literature has described various related aspects, this article aims to bring a more critical and contextual dimension of analysis. By combining empirical evidence, theoretical concepts, and current data, this paper is expected to make a significant contribution to our understanding of the impact of micronutrients on child growth.

The main aim of this study is to present an in-depth analysis of the role of micronutrient intake in the context of stunting prevention. Through a careful review of the literature, this article aims to more comprehensively illustrate how micronutrients play a key role in child development. Apart from that, this research also targets a critical assessment of the successes and obstacles of various nutrition programs that have been implemented in efforts to prevent stunting.

By detailing these aspects, this article seeks to provide a deeper understanding of the importance of micronutrient intake in the context of stunting prevention. In addition, it is hoped that it will

stimulate further discussion, motivate further research, and provide a basis for the formulation of more effective policies in addressing this serious problem.

METHOD

This research uses a literature review method to gain an in-depth understanding of the importance of micronutrient intake in preventing stunting in children (Rebora, 2023). The initial step of the research involves identifying the research theme, which in this case is the relationship between micronutrient intake and the incidence of stunting. The choice of this theme is based on the urgency of the global health issue related to stunting, and the need to explore the contribution of micronutrients in preventing this condition.

The next process involves searching and collecting literature from various trusted sources, such as scientific journals, books, and current research reports (Zhang and Yu, 2023). The literature search will focus on the last five years to ensure the relevance and novelty of the information (Tang *et al.*, 2023). The use of specific keywords such as "micronutrients," "stunting," and "prevention" will be used to filter the literature most relevant to the research objectives.

After collecting the necessary literature, the next step is analysis and synthesis of the information found. This includes identifying key findings, trends and patterns of association between micronutrient intake and stunting incidence rates. Next, the results of the analysis will be arranged in a conceptual framework that systematically describes the relationship between these factors.

RESULTS AND DISCUSSION

Stunting: Concept and Impact

Stunting, as an important aspect of children's health, describes a condition of inadequate growth that can have a long-term impact on children's well-being (Andriani *et al.*, 2023; Thahir *et al.*, 2023). This concept is not just a measure of height, but an indicator of chronic malnutrition. In the context of child health, stunting indicates that children do not reach their optimal growth potential, and this definition is recognized globally by the World Health Organization (WHO) (Paramashanti *et al.*, 2022). According to WHO, the criteria for stunting is when a child's height is below two standard deviations from the median height of healthy children on their growth curve (WHO, 2021). This definition reflects international standards that help measure the extent to which a child is not achieving the expected growth for his or her age.

The importance of understanding the condition of stunting lies not only in the physical aspect, but also in its long-term impacts. Stunting can be chronic, meaning that its effects can continue into adulthood. In the child's growth phase, deficiencies in essential nutrients such as iron, vitamin A, and zinc can be detrimental to the development of key organs, including the brain (Alioma, Zeller and Ling, 2022; Donkor *et al.*, 2022). Therefore, stunting not only affects children's physical health, but also shows a significant impact on their cognitive development and overall life potential.

Through WHO definition standards, the global community receives uniform guidance for identifying and understanding stunting. This is an important basis for prevention and intervention efforts aimed at minimizing the impact of stunting on children throughout the world (United Nation, 2021; WHO, 2021). Awareness of stunting as a global health issue is important in formulating appropriate health policies and effective nutrition programs to ensure optimal growth of children and prevent long-term risks related to stunting (Rafisa *et al.*, 2023; Wirawan *et al.*, 2023).

The factors causing stunting form a complex landscape, involving a number of interrelated variables. Lack of nutritional intake, especially essential micronutrients such as iron, vitamin A and zinc, is the main cause of stunting. Children who lack these nutrients experience obstacles in the growth of tissues and organs, affecting overall body function. This challenge often occurs in communities that experience difficulty in providing varied and nutritious food, making nutritional problems a central factor in the cause of stunting (Getahun *et al.*, 2023).

Apart from nutritional factors, environmental factors play an important role in stunting. Poor sanitation and insufficient availability of clean water can increase the risk of infectious diseases in children. These infections, especially during critical growth periods, can put an additional burden on children's bodies and hinder their normal growth (Rinanda *et al.*, 2023). Therefore, stunting is often the result of a combination of insufficient nutritional intake and a high infection burden.

Socio-economic factors also make a significant contribution to the high level of stunting. Maternal education, for example, plays a role in the understanding and practice of family nutrition (Habimana *et al.*, 2023). Families with low levels of education may be less aware of the importance of nutrition for their children's growth (Ernawati *et al.*, 2021). A family's economic status can also limit access to quality food and adequate health care (Anastasia *et al.*,

2023). In addition, inequalities in access to health services can have a significant impact on stunting rates, especially in economically marginalized areas (Hakeem, 2023).

An in-depth understanding of the factors that cause stunting is important in designing effective and sustainable intervention programs. Efforts to prevent stunting must include comprehensive nutrition strategies, improving sanitation, and increasing access to education and health services (Anastasia *et al.*, 2023). It is hoped that this holistic approach can reduce the burden of stunting effectively and have a positive impact on children's health and development.

The impact of stunting on children's growth and development is very significant. Children who are stunted tend to have a high risk of various infectious diseases because their immune system is weak. In addition, stunting can affect children's cognitive development, which has the potential to have long-term impacts on educational achievement and cognitive abilities. This factor is related to the lack of essential nutritional intake needed for optimal brain development during the child's growth period (Samosir, Radjiman and Aninditya, 2023).

The socio-economic impact of stunting is also worth paying attention to. Children who experience stunting are likely to experience delays in the development of their physical and cognitive abilities. This can reduce economic productivity at the individual level and cause an economic burden on society and the country as a whole. Therefore, preventing stunting is not only a public health responsibility, but also has a significant impact on social and economic development.

The impact of stunting on children's growth and development goes beyond the physical aspects and includes very significant dimensions of health and development. Children who are stunted have a high risk of various infectious diseases. This is caused by a weakened immune system due to lack of nutrition, making the body more susceptible to attack by pathogens. Stunting is an additional risk factor that can worsen the burden on children's health, especially in environments with low levels of sanitation and limited access to health services.

The impact of stunting doesn't just stop at the physical health aspect. The close relationship between stunting and children's cognitive development is a critical concern. Lack of essential nutritional intake, especially during the growth period, can hinder optimal brain development. This impact can cause delays in mastering cognitive skills, affecting children's learning abilities and educational achievements. Therefore, stunting is not only a physical health problem, but also has serious implications for children's cognitive development and life potential in the future.

The socio-economic impact of stunting has consequences that can be felt at the individual level and society as a whole. Children who experience stunting are likely to experience delays in the development of their physical and cognitive abilities. These limitations can hinder economic productivity at the individual level in adulthood, resulting in generations of people unable to reach their full potential. Therefore, preventing stunting is not only the responsibility of the public health sector, but also has a significant impact on social and economic development. Investment in stunting prevention can be considered a long-term strategy for creating healthier and economically sustainable communities.

The Important Role of Micronutrients

Micronutrients, as a group of essential nutrients, are key elements in maintaining the health and growth of the human body. Although required in small quantities, vitamins and minerals that fall into the micronutrient category have an irreplaceable role in carrying out complex biological functions. As enzyme cofactors and regulators of various metabolic processes, micronutrients contribute to the process of cell formation, protein synthesis, and maintaining the integrity and function of the body's organs. In line with this, meeting micronutrient needs is the main determining factor in maintaining optimal health and supporting children's growth (Getahun *et al.*, 2023; Rinanda *et al.*, 2023).

In the context of stunting prevention, micronutrients have a crucial role. Iron, as a micronutrient, for example, is involved in the production of hemoglobin which carries oxygen throughout the body. Iron deficiency can cause anemia, which in turn can affect oxygen absorption and slow a child's growth. Likewise, vitamin A is essential for eye health and the immune system, while zinc plays a role in DNA synthesis and cell growth (Anastasia *et al.*, 2023; Samosir, Radjiman and Aninditya, 2023). Understanding the specific role of each of these micronutrients is the basis for designing effective stunting prevention strategies.

The importance of a deep understanding of micronutrients is not only limited to the individual level, but also has far-reaching impacts at the population level. Micronutrient deficiencies can become a public health problem, especially in areas with low nutritional levels (Suratri *et al.*, 2023). Therefore, efforts to prevent stunting need to include strategies that increase public understanding of the importance of consuming foods rich in micronutrients and overcome barriers to access to these nutritional sources. Overall, a deep understanding of micronutrients is an important basis for overcoming complex health and nutrition challenges, especially in efforts to prevent stunting.

Several types of micronutrients have high relevance in efforts to prevent stunting. Iron is a micronutrient that plays an important role in preventing stunting. Iron is necessary for the formation of red blood cells, which carry oxygen throughout the body. Children who are deficient in iron can experience anemia, which can result in decreased immunity and stunted growth. Another example is vitamin A, which is essential for maintaining healthy eyes and the immune system. Vitamin A deficiency can cause serious vision problems and make children more susceptible to infections. Therefore, adequate intake of iron and vitamin A is key in overcoming the risk of stunting.

Table 1 Important Role of Micronutrients

MICRONUTRIENTS	IMPORTANT ROLE	FOOD SOURCES
Iron	- Formation of red blood cells which carry oxygen throughout the body.	- Red meat, liver, chicken, fish, nuts, green leafy vegetables (such as spinach), iron-fortified cereals.
VITAMIN A	- Maintain eye health and immune system.	- Carrots, sweet potatoes, red peppers, spinach, mango, eggs, liver, milk and dairy products.
ZINC	- Required for DNA synthesis, maintenance of cell structure, and immune system function.	- Red meat, chicken, fish, nuts, sunflower seeds, dairy products, zinc-fortified cereals.
VITAMIN D	- Important for calcium absorption, which is needed for optimal bone and tooth growth.	- Fatty fish (such as salmon, tuna), eggs, dairy products enriched with vitamin D (milk, yogurt), fish oil.

Zinc is another micronutrient that has a significant impact on cell growth and development. Zinc is necessary for DNA synthesis, maintenance of cell structure, and immune system function. Zinc deficiency can cause impaired growth and development, becoming a contributing factor to stunting. For example, children with zinc deficiency may experience delays in growth in height and weight. Therefore, it is important to ensure adequate zinc intake in children's diets to prevent the risk of stunting.

Apart from that, vitamin D intake also has a role in preventing stunting. Vitamin D plays an important role in calcium absorption, which is needed for optimal bone and tooth growth. Vitamin D deficiency can inhibit calcium absorption, resulting in weak bones and affecting a child's growth. Examples of foods rich in vitamin D include fatty fish, eggs, and fortified dairy products.

Overall, involving various micronutrients such as iron, vitamin A, zinc and vitamin D in stunting prevention strategies provides a comprehensive and integrated approach. Understanding the role of each micronutrient helps design appropriate and effective nutrition programs, which are key to reducing the risk of stunting and improving children's overall health and development.

The relationship between micronutrient intake and child growth is very complex and interrelated. Adequate micronutrient intake supports optimal growth and development of cells and organs. On the other hand, micronutrient deficiencies can limit a child's body's ability to grow and develop normally. Moreover, very critical growth periods, such as the first 1,000 days of life, exhibit high micronutrient requirements to support optimal growth and development processes.

In the context of stunting prevention, understanding how micronutrients interact with the growth process is key. Iron, for example, is needed for the synthesis of hemoglobin which transports oxygen, while vitamin A supports the growth of eye cells and other body tissues. Therefore, treating stunting not only involves increasing micronutrient intake through food and supplements, but also a deep understanding of how these micronutrients influence growth and development processes at the cellular level.

The importance of micronutrients in preventing stunting demands a holistic approach in planning nutrition programs. The integration of nutrition education, monitoring nutritional status, and better access to foods rich in micronutrients is the basis for supporting children's optimal growth. With a deeper understanding of the role of micronutrients, more effective and sustainable interventions can be designed to address the challenge of stunting in various child populations.

Critical Analysis of Micronutrient Intake in Society

The availability of micronutrients in the community environment has a major impact on children's nutritional intake. Especially in less developed regions, access to foods rich in micronutrients is often limited. Economic, geographic and infrastructure factors are the main obstacles in ensuring people have access to diverse and nutritious food sources. Therefore, it is necessary to pay attention to how policies and programs can increase the availability of needed micronutrients in society.

Community consumption patterns play a key role in children's micronutrient intake. Unbalanced eating habits and a lack of variety in types of food can result in micronutrient deficiencies. For example, people who tend to eat foods high in carbohydrates but low in protein and vitamins may be at high risk of experiencing nutritional deficiencies. Therefore, analysis of people's

consumption patterns needs to be carried out to design appropriate nutritional education programs to increase awareness of the importance of a balanced micronutrient intake.

Table 2 Influence Factors of Micronutrients

MICRONUTRIENT INFLUENCE FACTORS	DESCRIPTION
Food Accessibility	- Availability and accessibility of nutritious food in the surrounding environment.
FAMILY FINANCIAL CONDITION	- The family's financial ability to purchase nutritious food and meet children's nutritional needs.
NUTRITION KNOWLEDGE	- Level of knowledge of parents and family members about good nutrition and the importance of micronutrients.
EATING HABIT	- Children's daily eating patterns, including less than optimal eating habits such as a lack of food variety and less nutritious food choices.
ENVIRONMENTAL CONDITIONS	- Surrounding environmental conditions, including poor sanitation which can increase the risk of infection and reduce the body's ability to absorb micronutrients.
HEALTH EDUCATION	- Availability and accessibility of information about good nutrition through health education programs in the community.
NUTRITIONAL PRACTICES IN THE HOUSEHOLD	- Nutrition policies and practices in the household, including cooking and food storage habits that can affect nutritional quality.
ACCESS TO HEALTH SERVICES	- Accessibility and availability of health services which include health checks, nutritional consultations, and distribution of micronutrient supplements if necessary.

Factors influencing micronutrient intake in children include a variety of things, from accessibility to nutritional practices in the household. The family's financial inability to buy nutritious food, lack of knowledge about good nutrition, and less than optimal eating habits can be the main obstacles. In addition, environmental conditions, such as poor sanitation, can also increase the risk of infection and reduce the body's ability to absorb micronutrients effectively. Therefore, stunting prevention strategies need to consider these factors and design interventions that are appropriate to the community context.

Government nutrition policy has a large role in determining the conditions of micronutrient intake in society. Critical evaluation of existing policies, including supplementation programs, food fortification, and nutrition education, is needed to assess the extent to which these policies

are effective and accessible to all levels of society. It should be noted that the implementation of this policy must be inclusive, taking into account cultural and economic diversity in society.

Nutrition education in the community is key in overcoming micronutrient deficiencies. Educational programs targeting parents and educators have the potential to increase knowledge about good nutrition and empower them to make healthier food choices. Through nutrition education, it is hoped that society can better understand the impact of micronutrients on children's growth and adopt better nutritional practices in everyday life.

Environmental changes, including climate change and urbanization, can affect the availability and access to nutritious foods. In addition, globalization can bring changes to people's consumption patterns by introducing less nutritious fast food. Therefore, critical analysis of the impact of environmental change and globalization on micronutrient intake needs to be considered in designing stunting prevention strategies.

Social and cultural factors such as food traditions, gender roles in food distribution, and societal value systems also influence micronutrient intake. An in-depth analysis of these factors can help design stunting prevention programs that are acceptable and in line with the values and habits of local communities.

It is important to carry out continuous monitoring and evaluation of implemented nutrition programs. This includes not only impact evaluation, but also analysis of implementation obstacles and improvements that can be made. Good monitoring will provide insight into the effectiveness of interventions, and ongoing evaluation can help refine stunting prevention programs to be more responsive to community needs. By delving deeper into these aspects, critical analysis of micronutrient intake in society provides a solid foundation for designing and implementing sustainable and effective stunting prevention strategies.

CONCLUSION

Stunting as a global health problem shows complexity involving nutritional, social and economic factors. The data depicts a high prevalence, forcing us to investigate the aspects that influence it in depth. The close relationship with nutritional deficiencies, especially iron, vitamin A and zinc, demands a holistic approach that integrates health, education and economic dimensions.

The importance of socio-economic factors, such as maternal education and family economic status, raises awareness of inequalities and broadens access to health resources. Regional

challenges in Indonesia highlight inequities in health and nutrition service delivery. Long term, stunting has an economic impact, emphasizing the urgency of investing in prevention as a step towards sustainable development.

In the context of micronutrients, the focus on iron, vitamin A, zinc and vitamin D shows the relevance of preventing stunting by increasing micronutrient intake. However, the challenges of accessibility and knowledge regarding nutrition remind us to understand the local community context in more depth.

The importance of a holistic approach, which includes improved nutrition, sanitation and health education, marks the direction towards more effective and positive impact solutions. Critical analysis of the complexities of stunting invites us to investigate solutions that are contextual and evidence-based, encouraging a deeper understanding of the dynamics of children's health at the global level. With that, the hope is that we can design preventive steps that are focused, meaningful, and can bring change to the future of global public health.

ACKNOWLEDGEMENT

We express our gratitude to the Medan Health Polytechnic for providing technical support until the completion of the article.

REFERENCES

Alioma, R., Zeller, M. and Ling, Y.K. (2022) 'Analysis of long-term prices of micronutrient-dense and starchy staple foods in developing countries', *Agricultural and Food Economics*, 10(1). Available at: https://doi.org/10.1186/s40100-022-00232-9.

Anastasia, H. *et al.* (2023) 'Determinants of stunting in children under five years old in South Sulawesi and West Sulawesi Province: 2013 and 2018 Indonesian Basic Health Survey', *PLoS ONE*, 18(5 May), pp. 1–18. Available at: https://doi.org/10.1371/journal.pone.0281962.

Andriani, H. *et al.* (2023) 'A multilevel analysis of the triple burden of malnutrition in Indonesia: trends and determinants from repeated cross-sectional surveys', *BMC Public Health*, 23(1), pp. 1–16. Available at: https://doi.org/10.1186/s12889-023-16728-y.

Donkor, W.E.S. *et al.* (2022) 'Risk factors of stunting and wasting in Somali pre-school age children: results from the 2019 Somalia micronutrient survey', *BMC Public Health*, 22(1), pp. 1–12. Available at: https://doi.org/10.1186/s12889-021-12439-4.

Ernawati, F. *et al.* (2021) 'Micronutrient deficiencies and stunting were associated with socioeconomic status in indonesian children aged 6–59 months', *Nutrients*, 13(6). Available at: https://doi.org/10.3390/nu13061802.

Getahun, G.K. *et al.* (2023) 'Prevalence and correlates of stunting and thinness among adolescent students in Lideta subcity, Addis Ababa, Ethiopia: A cross-sectional study', *BMJ Open*, 13(5). Available at: https://doi.org/10.1136/bmjopen-2022-065347.

Habimana, J. de D. *et al.* (2023) 'Prevalence and Correlates of Stunting among Children Aged 6–23 Months from Poor Households in Rwanda', *International Journal of Environmental Research and Public Health*, 20(5). Available at: https://doi.org/10.3390/ijerph20054068.

Hakeem, R. (2023) 'Stunting Variations Among Countries', 17(3), pp. 427–438.

Micha, R. (2022) *Global Nutrition Report, Global Nutrition Report*.

Paramashanti, B.A. *et al.* (2022) 'Wealth- and education-related inequalities in minimum dietary diversity among Indonesian infants and young children: a decomposition analysis', *Global Health Action*, 15(1). Available at: https://doi.org/10.1080/16549716.2022.2040152.

Rafisa, A. *et al.* (2023) 'Situational analysis of nutritional status among 1899 children presenting with cleft lip and/or palate in Indonesia', *Journal of Global Health*, 13(September 2014), pp. 1–13. Available at: https://doi.org/10.7189/JOGH.13.04127.

Rebora, S. (2023) 'Sentiment Analysis in Literary Studies. A Critical Survey', *Digital Humanities Quarterly*, 17(2), pp. 1–6.

Rinanda, T. *et al.* (2023) 'Correlation between gut microbiota composition, enteric infections and linear growth impairment: a case–control study in childhood stunting in Pidie, Aceh, Indonesia', *Gut Pathogens*, 15(1), pp. 1–15. Available at: https://doi.org/10.1186/s13099-023-00581-w.

Samosir, O.B., Radjiman, D.S. and Aninditya, F. (2023) 'Food consumption diversity and nutritional status among children aged 6-23 months in Indonesia: The analysis of the results of the 2018 Basic Health Research', *PLoS ONE*, 18(3 March), pp. 1–14. Available at: https://doi.org/10.1371/journal.pone.0281426.

Suratri, M.A.L. *et al.* (2023) 'Risk Factors for Stunting among Children under Five Years in the Province of East Nusa Tenggara (NTT), Indonesia', *International Journal of Environmental Research and Public Health*, 20(2). Available at: https://doi.org/10.3390/ijerph20021640.

Tang, F.S.K.B. *et al.* (2023) 'Guidance for Clinical Evaluation under the Medical Device Regulation through Automated Scoping Searches', *Applied Sciences (Switzerland)*, 13(13). Available at: https://doi.org/10.3390/app13137639.

Thahir, A.I.A. *et al.* (2023) 'Exploring Factors Associated with Stunting in 6-Month-Old Children: A Population-Based Cohort Study in Sulawesi, Indonesia', *Nutrients*, 15(15). Available at: https://doi.org/10.3390/nu15153420.

UNICEF Indonesia (2022) 'Laporan Tahunan 2021 UNICEF Indonesia', *United Nations Children's Fund World Trade Centre 2*, pp. 16–16.

United Nation (2021) *Global Nutrition Report 2021, Global Nutrition Report*. Available at: https://globalnutritionreport.org/documents/851/2021_Global_Nutrition_Report_aUfTRv0.pdf.

United Nations Children's Fund (UNICEF) (2020) 'Situasi Anak di Indonesia - Tren, peluang, dan Tantangan dalam Memenuhi Hak-Hak Anak', *Unicef Indonesia*, pp. 8–38.

USAID Indonesia (2022) 'Survei Demografi Dan Kesehatan Indonesia 2022', pp. 1–2.

WHO (2021) 'On Setting And Implementing A Stunting Reduction Agenda Action points for country programme implementers'. Available at: www.who.int/nutrition.

Wirawan, N.N. *et al.* (2023) 'Development of Food Multi-Mix Using a Linear Programming Approach to Fill the Nutrient Gap of Amino Acids and Micronutrients for Stunted Non-Wasted Children', *Foods*, 12(1). Available at: https://doi.org/10.3390/foods12010064.

Zhang, Q. and Yu, Z. (2023) 'A Bibliographic Review and Meta-Analysis of the Effect of Teaching Behaviors on Learners' Performance in Videotaped Lectures', *Education Research*

International, 2023. Available at: https://doi.org/10.1155/2023/9292513.