

IMPLEMENTATION OF INTERVENTION PROGRAMS AS AN EFFORT TO PREVENT STUNTING IN INDONESIA AND DEVELOPING COUNTRIES: LITERATURE REVIEW

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ABSTRACT

The purpose of this study is to obtain an overview of the interventions carried out in an effort to prevent stunting in developing countries, especially in Indonesia. The author used the literature review method with a range of years 2018-2023 and accessed three main databases, namely Pubmed, ScienceDirect, and Google Scholar. The results showed that effective interventions in preventing stunting in Indonesia and developing countries involve specific actions in the field of nutrition. These include food fortification, food supplements, and health education efforts. In addition, nutrition-sensitive interventions, such as water, sanitation and hygiene (WASH) improvement activities, were also found to be beneficial. It is recommended that nutrition-specific intervention programs, such as food fortification, complementary food supplements, and health education, be one of the main strategies to prevent stunting in children under five years of age

Keywords: Intervention, Prevention, Stunting, Indonesia, Developing Countries

INTRODUCTION

Stunting has become a health issue that requires global attention in recent years, especially in low- and middle-income countries (Bukusuba, Kaaya dan Atukwase, 2017). Stunting in children under five is caused by poor nutrition and susceptibility to infection, especially during the first 1000 days of life (HPK). This makes the child more susceptible to disease and at risk of developing adverse conditions as an adult (Mbuya dan Humphrey, 2018). Stunting is identified as a global health priority, with prevalence rates reaching 22% or approximately 149.2 million cases by 2020 (WHO, 2021).

Based on WHO (2020), the prevalence of stunting in Southeast Asian countries is 33.8%, including Myanmar 35%, Vietnam 23%, Malaysia 17%, Thailand 16% and Singapore 4% (Apriluana dan Fikawati, 2018) while in Indonesia the incidence of stunting reached 36.4% (Kemenkes, 2018).

Stunting in toddlers can be caused by several factors.

According to WHO (2018), the three main causes of stunting involve poor nutrition during pregnancy and inadequate maternal health, inadequate exclusive breastfeeding, and infectious diseases. The impacts of stunting, which are often unrecognized by society, include reduced cognitive and physical development, reduced productivity, and increased risk of degenerative diseases such as diabetes.

This finding is in line with the research of Alam *et al* (2020) which states that toddlers who experience stunting can experience a decrease in cognitive development compared to toddlers who are not stunted. This impact is not only individual but can also have an impact on the economic conditions of a country in the future.

According to WHO (2017), there are two types of interventions implemented to prevent stunting: specific nutrition interventions and nutrition-sensitive interventions. Specific nutrition interventions include providing vitamin A, zinc, iron, energy and protein supplements to pregnant women, breastfeeding mothers and children under five. In addition, these

interventions also include adequate breastfeeding, complementary feeding, and prevention of infectious diseases (Bhutta et al., 2018). While sensitive interventions aim to direct programs that increase community awareness through environmental hygiene practices, improved maternal and child nutrition practices, and increased access to nutritious foods (Satriawan, 2018).

According to Hossain (2017) specific and sensitive nutrition intervention programs implemented in developing countries have proven effective in reducing the incidence of stunting. To increase the success of stunting prevention interventions, some countries have created strategic programs such as food fortification with iodine, iron, folic acid, and vitamins. In developed countries such as Japan, interventions focus on the nutrition of adolescent girls, pregnant women, and breastfeeding mothers, while increasing fish intake and creating healthy smoke-free environments (Masuno, 2018). Meanwhile, Indonesia has developed a stunting prevention program through supplementary feeding, provision of fat-based nutritional supplements, provision of soy milk jam, counseling for mothers and toddlers (Mistry, Hossain dan Arora, 2019).

Based on the previous description, researchers are interested in conducting a literature review to provide a comprehensive overview of the implementation of intervention programs as a measure to prevent stunting in Indonesia and other developing countries. Researchers have observed several articles related to interventions to prevent stunting in children under five, especially in developing countries, including Indonesia.

There are a number of studies that emphasize interventions through supplementary feeding and food supplements as strategies to prevent stunting. Therefore, although there have been many studies involving stunting prevention interventions, an in-depth literature review is needed on the topic of stunting prevention intervention research in children under five in developing countries, including Indonesia.

METHODOLOGY

The design of this research is a literature review. The nature of this research is descriptive analysis, namely describing regularly the data obtained, then given an understanding and explanation so that it is easy for the reader to understand. In this study, researchers analyzed stunting prevention interventions in toddlers in Indonesia and developing countries. The author used a search for published articles from the Pubmed, ScienceDirect and Google Scholar databases from 2018-2023. Furthermore, article searches use keywords and boolean operators (AND, OR NOT or AND NOT) which are used to facilitate a search. The researcher used keywords other than that adjusted to the keywords in accordance with MeSH as follows "Intervention OR Specific nutritional intervention OR sensitive nutritional intervention OR intervention OR specific nutritional intervention OR sensitive nutritional intervention, Prevention OR prevention OR reduction, Stunting OR Stunted", developing countries OR Developing countries, birth to 59 months

The search for articles was carried out with the inclusion criteria that have been set using the PICOS format, namely Population (children aged 0-59 months), Interventions (nutrition sensitive and specific or others in preventing stunting), Comparisons (-), Outcomes (prevention of stunting), Study design (Randomized controlled trial and quasi experiment) Publication type (2018-2023) and Language (English and Indonesian).

Based on the results of the selection of studies that have been carried out, 7115 publications were obtained from each database search. After that, the articles were then filtered

based on the inclusion and exclusion criteria, 5174 were obtained, then the articles were filtered by looking at duplicate articles, 121 duplicate articles were found so that only 1820 articles were left by looking at the titles and abstracts, 26 articles were found, then the articles were extracted again so that 9 articles were selected which would be analyzed by the researchers.

RESULTS

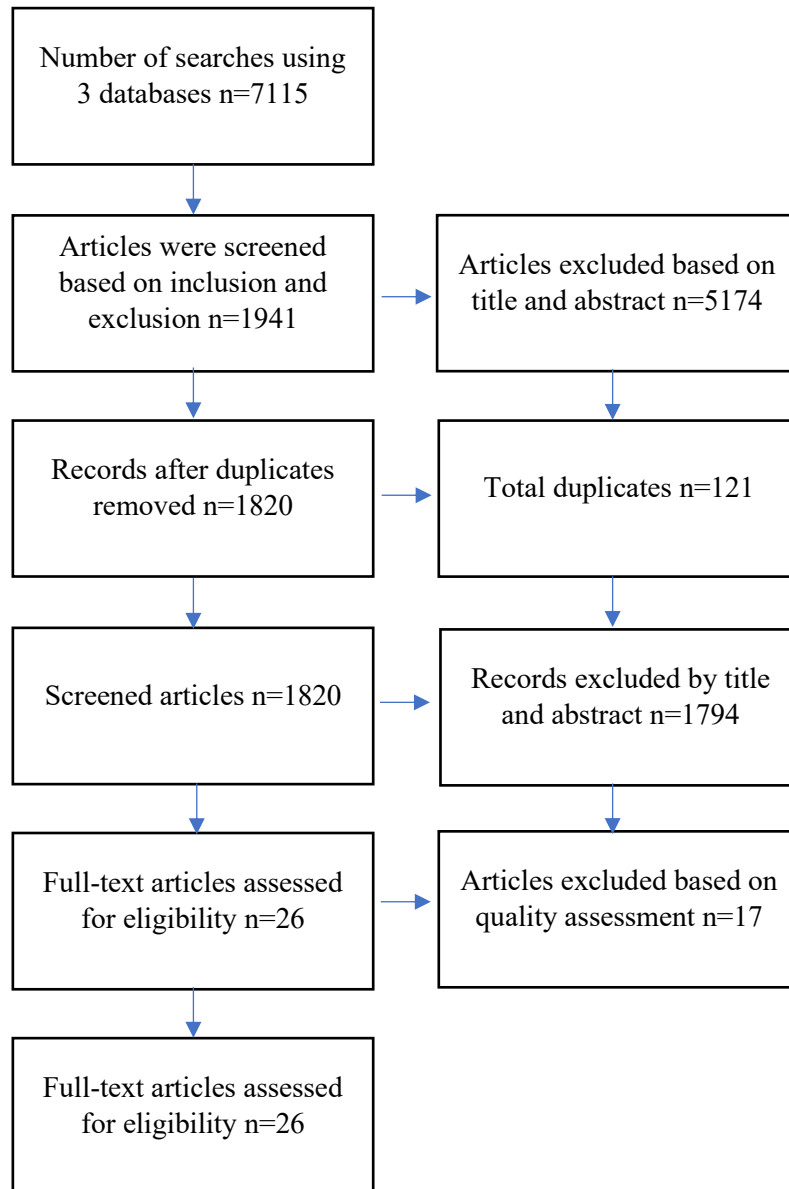


Diagram 1: Flow Literature Review

Table Result

Table 1
Summary of Content Analysis Results of Selected Articles (n=9)

No	Author, Title, Article, Literature Type	Years	Purpose	Result
1	Ara <i>et al.</i> , Study protocol to assess the impact of an integrated nutrition intervention on the growth and development of children under two in rural Bangladesh, Cluster randomized controlled trial (RCT)	2019	To determine the effectiveness of a 12-month nutrition intervention to improve the nutritional status of body length/height in children aged 6-12 months.	After 12 months of intervention, there was an effect in improving the linear growth of children in developing countries.
2	Khan <i>et al.</i> , Effect of lipidbased nutrient supplement medium quality on reduction of stunting in children 6-23 months of age in Sindh, Pakistan, A cluster randomized controlled trial	2020	To test the hypothesis that the administration of a lipid-based nutritional supplement-moderate quantity (LNS-MQ) known as Wawamum would result in a 10% reduction in the risk of stunting at 24 months of age in the intervention group compared to the control group.	Compared to children who received standard government health services, children who received wawamum showed a significant reduction in the risk of stunting in children aged 6-12 months ($p<0.001$) and 13-18 months ($p=0.008$). This study shows that providing wawamum to children aged 6-23 months effectively reduces the risk of stunting.
3	Leroy, Olney dan Ruel, Tubaramure, a food-assisted integrated health and nutrition program, reduces child stunting in Burundi, Cluster Randomized controlled trial (RCT)	2018	To evaluate the impact of the FA-MCHN tubaramure program (complementary foods for the health and nutrition of pregnant women and children aged 6-24 months) on child height growth and to evaluate the impact of variations in the timing and duration of feeding.	The results in the study for 1000 HPK with the provision of a food program containing a mixture of soybean corn and vegetable oil enriched with microelements in the intervention group showed more significant results in children's linear growth by 74 points with $p>0.05$.
4	Humphrey <i>et al.</i> , Independent and combined effects of improved water, sanitation, and hygiene, and improved complementary feeding, on child stunting and anaemia in Rural	2019	to determine the impact of improved WASH and complementary interventions on stunting prevention.	Sanitation and hygiene (WASH) interventions implemented at the household level in low-income rural areas are likely to reduce the incidence of stunting. These WASH interventions combined with young child feeding can

	Zimbabwe, Cluster Randomized trial			reduce the incidence of stunting
5	Utami dan Juliani, Mental, social psychological stimulation and nutrition supplementation affects stunting incidence among children in Indonesia, Pre dan post Quasi eksperimen	2020	to determine how effective social psychological stimulation, nutritional supplementation, and mental stimulation are in preventing stunting.	Attitudes before and after the intervention increased from 45% to 67.5% with a difference of 20% and social and psychological stimulation also increased from 42.5% to 72.5% & a difference of 30%. After giving 6 months of intervention, the anthropometric status of stunted children changed significantly both before and after the intervention. the results obtained 52.5% became not stunted or normal. There is a significant change in anthropometric status in stunted children before and after the application of the three interventions.
6	Sirajuddin et al, The intervention of maternal nutrition literacy has the potential to prevent childhood stunting, Randomized control trials	2021	This study aims to assess the impact of maternal nutrition literacy (MNL) on increasing the height or score of stunted children.	Stunting status is determined by the difference in the distribution of stunting before and after the intervention in the intervention group and the intervention and control groups. There was a decrease of about 9.3% of MNL in the intervention group, while in the control group it only decreased by 2.4% (p<0.05). while the control group only decreased by 2.4% (p<0.05).
7	Ringgi dan Keuytimu., Intervensi berbasis edukasi pada ibu terhadap feeding practice ibu dalam upaya peningkatan status gizi anak stunting pada usia 6-24 bulan, Quasi Experiment	2022	To determine the effect of educational interventions on the eating practices of mothers who have stunted toddlers.	There was an increase in pre-post test scores, which amounted to 37.73 and post-test of 43.04.
8	George et al., effect of a water, sanitation and hygiene mobile health program on diarrhea and child growth in bangladesh, Cluster	2021	To determine the delivery of mHealth program through mobile messaging and household visits on diarrhea patients	Children <2 years of age in the intervention group with visits had a lower risk of stunting with an OR: 0.55 than children in the no-visit group OR: 0.54.

	Randomized controlled trial		and stunting incidence	
9	Banowo dan Hidayat, Pengaruh edukasi gizi terhadap praktik pemberian makan pada baduta stunting di kabupaten bengkulu utara, Quasi experiment	2021	To determine the effect of nutrition education intervention on feeding practices of mothers with stunted infants	The results of the dependent test showed that there was a difference in the average feeding practices between the intervention groups with a p value of 0.000 and 0.168, and an independent test between the intervention group and the control group was 0.000.

DISCUSSION

Stunting is a long-standing malnutrition problem caused by several factors such as poor maternal nutrition, non-exclusive breastfeeding and infectious diseases (Helmyati, 2019) In addition, protein energy intake, parental education, parental employment, economic status, low birth weight, knowledge, attitudes, environment and genetics are factors that can affect stunting (Rahayu et al., 2018).

The incidence of stunting has become a global problem that can affect the country's economy, each study tests various interventions that are effective in reducing the risk of stunting in each country. A study conducted by Ara (2019) in Bangladesh, implementing a nutrition counseling intervention program and counseling for parents who have children with stunting proved effective, besides that food supplementation interventions given to working mothers with low parental education tend to reduce the incidence of stunting in children. By providing nutritional counseling and counseling, it can encourage mothers to prepare and provide nutritious food to their children.

Research conducted by Khan (2020) in Pakistan by providing fat-based foods given to infants aged 6-18 months every day for two years showed a significant reduction in the risk of stunting. Providing this supplementation in the 1000 HPK period showed that children experienced better growth than children who were not supplemented at all. Interventions with supplementation provide varying results on child growth as based on research by Leroy et al (2018) in the country of Burundi conducted a tubaramure supplementation program which includes a mixture of corn, soybeans and vegetable oil which is like a micronutrient that can improve maternal and child nutrition, the results of this study state that the prevalence of stunting in children aged 6-24 months shows significant results in linear growth.

Another study by Humphrey (2019) conducted in Zimbabwe explained that by improving sanitation programs combined with water quality with nutritious breastfeeding has an influence to reduce the incidence of stunting, but this is also a problem for the majority of people who are not highly educated which means that the resulting household income will be low. As a result, people have difficulty meeting their basic needs for food and clean water. This is in line with George (2021) research conducted in Bangladesh by conducting a mobile health program (mHealth) developed through a theory-based approach based on an integrated behavioral model for water, sanitation and hygiene proving that this program significantly reduced the incidence of diarrhea and stunting in children, and resulted in sustainable hand washing with soap and improved household drinking water quality over a 12-month period. In addition, other findings showed that frequent home visits were not necessary to facilitate WASH behavior change.

In Indonesia, many efforts and research have been conducted to find the right solution to reduce the prevalence of stunting. In preventing stunting, specific and sensitive nutritional

interventions are needed. Based on Utami dan Juliani (2020) research conducted in DKI Jakarta, it is stated that providing complementary foods and food supplements that are high in protein, fat and zinc can help toddlers' linear growth, besides that this study also evaluates the effect of mental, social and psychological stimulation on stunting prevention. According to researchers, these three stimulations can help families and children under five deal with nutritional problems. Another form of health intervention is nutrition education, which is a component of health education and aims to change the behavior of individuals, families, groups, and communities towards health.

According to research by Sirajuddin *et al* (2021) through maternal nutrition literacy activities and integrated nutrition, the Maternal Nutritional Literacy (MNL) intervention is one method that can be used to reduce the prevalence of stunting in children aged 0 to 6 months. It is conducted through classroom education, classroom simulation, child growth monitoring, hand sanitation, and home visits twice and a total of 15 times. This activity also focuses on the ability of mothers to understand the concept and application of breastmilk nutrition and complementary food literacy. This is in line with Ringgi dan Keuytumu (2022) which states that providing nutrition education combined with demonstration methods related to feeding practices, such as the amount of nutrients and meal choices have an important influence. Meanwhile, according to Banowo dan Hidayat (2021) after respondents received a nutrition education program regarding feeding practices through media in the form of booklets and food samples, it had an effect on children aged 7-24 months who were stunted so that they could practice directly how to feed properly according to the nutritional intake needed by children.

CONCLUSION

Interventions to prevent stunting in Indonesia and developing countries involve nutrition-specific strategies, including food fortification, food supplements and health education. In addition, nutrition-sensitive interventions are also implemented through water, sanitation and hygiene (WASH) improvement activities. The results show that the provision of specific and sensitive nutrition interventions has been shown to be effective in reducing the incidence of stunting in children.

REFERENCES

- Alam, M. A., Richard, S. A., Fahim, S. M., Mahfuz, M., Nahar, B., Das, S., Shrestha, B., Koshy, B., Mduma, E., Seidman, J. C., Murray-Kolb, L. E., Caulfield, L. E., Lima, A. A. M., Bessong, P., & Ahmed, T. (2020). Erratum: Impact of early-onset persistent stunting on cognitive development at 5 years of age: Results from a multi-country cohort study (PLoS One (2020) 15:1 (e0227839) DOI: 10.1371/journal.pone.0227839). *PLoS ONE*, 15(2), 1–16. <https://doi.org/10.1371/journal.pone.0229663>
- Apriluana, G., & Fikawati, S. (2018). Analisis Faktor-Faktor Risiko terhadap Kejadian Stunting pada Balita (0-59 Bulan) di Negara Berkembang dan Asia Tenggara. *Media Penelitian Dan Pengembangan Kesehatan*, 28(4), 247–256. <https://doi.org/10.22435/mpk.v28i4.472>
- Ara, G., Sanin, K. I., Khanam, M., Sarker, S. A., Khan, S. S., Rifat, M., Chowdhury, I. A., Askari, S., Afsana, K., & Ahmed, T. (2019). Study protocol to assess the impact of an integrated nutrition intervention on the growth and development of children under two in rural Bangladesh. *BMC Public Health*, 19(1), 1–10. <https://doi.org/10.1186/s12889-019-7777-y>
- Banowo, A. S., & Hidayat, Y. (2021). Pengaruh Edukasi Gizi terhadap Praktik Pemberian

- Makan Pada Baduta Stunting di Kabupaten Bengkulu Utara. *Jurnal Ilmiah Universitas Batanghari Jambi*, 21(2), 765. <https://doi.org/10.33087/jiubj.v21i2.1539>
- Bhutta, Z., Lassi, Z. K., Dolan, C., & Fanzo, J. (2018). Global Nutrition Report: Shining a light to spur action on nutrition. In *Global Nutrition Report*.
- Bukusuba, J., Kaaya, A. N., & Atukwase, A. (2017). Predictors of Stunting in Children Aged 6 to 59 Months: A Case–Control Study in Southwest Uganda. *Food and Nutrition Bulletin*, 38(4), 542–553. <https://doi.org/10.1177/0379572117731666>
- George, C. M., Monira, S., Zohura, F., Thomas, E. D., Hasan, M. T., Parvin, T., Hasan, K., Rashid, M. U., Papri, N., Islam, A., Rahman, Z., Rafique, R., Islam Bhuyian, M. S., Saxton, R., Labrique, A., Alland, K., Barman, I., Jubyda, F. T., Afroze, F., ... Alam, M. (2021). Effects of a Water, Sanitation, and Hygiene Mobile Health Program on Diarrhea and Child Growth in Bangladesh: A Cluster-randomized Controlled Trial of the Cholera Hospital-based Intervention for 7 Days (CHoBI7) Mobile Health Program. *Clinical Infectious Diseases*, 73(9), E2560–E2568. <https://doi.org/10.1093/cid/ciaa754>
- Helmyati, S. (2019). *Stunting Permasalahan Dan Penanganannya*. Gadjah Mada University Press.
- Hossain, M., Choudhury, N., Abdullah, K. A. B., Mondal, P., Jackson, A. A., Walson, J., & Ahmed, T. (2017). Evidence-based approaches to childhood stunting in low and middle income countries: A systematic review. *Archives of Disease in Childhood*, 102(10), 903–909. <https://doi.org/10.1136/archdischild-2016-311050>
- Humphrey, J. H., Mbuya, M. N. N., Ntozini, R., Moulton, L. H., Stoltzfus, R. J., Tavengwa, N. V., Mutasa, K., Majo, F., Mutasa, B., Mangwadu, G., Chasokela, C. M., Chigumira, A., Chasekwa, B., Smith, L. E., Tielsch, J. M., Jones, A. D., Manges, A. R., Maluccio, J. A., Prendergast, A. J., ... Makoni, T. (2019). Independent and combined effects of improved water, sanitation, and hygiene, and improved complementary feeding, on child stunting and anaemia in rural Zimbabwe: a cluster-randomised trial. *The Lancet Global Health*, 7(1), e132–e147. [https://doi.org/10.1016/S2214-109X\(18\)30374-7](https://doi.org/10.1016/S2214-109X(18)30374-7)
- Kementrian Kesehatan Republik Indonesia. (2018). *Situasi Balita Pendek (Stunting) Di Indonesia*. Buletin Jendela Data Dan Informasi Kesehatan. www.depkes.go.id
- Khan, G. N., Kureishy, S., Ariff, S., Rizvi, A., Sajid, M., Garzon, C., Khan, A. A., De Pee, S., Soofi, S. B., & Bhutta, Z. A. (2020). Effect of lipid-based nutrient supplement-medium quantity on reduction of stunting in children 6-23 months of age in Sindh, Pakistan: A cluster randomized controlled trial. *PLoS ONE*, 15(8 August), 1–14. <https://doi.org/10.1371/journal.pone.0237210>
- Leroy, J. L., Olney, D., & Ruel, M. (2018). Tubaramure, a food-assisted integrated health and nutrition program, reduces child stunting in burundi: A cluster-randomized controlled intervention trial. *Journal of Nutrition*, 148(3), 445–452. <https://doi.org/10.1093/jn/nxx063>
- Masuno, K., Iwamoto, S., & Kondo, T. (2018). An Overview of Nutrition and Sustainable Development Goals (SDGs): What Japan is Doing in the Context of Aging, Urbanization, and Globalization. *Gakuen*, 938, 14–25. https://swu.repo.nii.ac.jp/?action=pages_view_main&active_action=repository_view_main_item_detail&item_id=6639&item_no=1&page_id=30&block_id=97
- Mbuya, M. N. N., & Humphrey, J. H. (2018). Preventing environmental enteric dysfunction through improved water, sanitation and hygiene: An opportunity for stunting reduction in developing countries. *Maternal and Child Nutrition*, 12, 106–120. <https://doi.org/10.1111/mcn.12220>
- Mistry, S. K., Hossain, M. B., & Arora, A. (2019). Maternal nutrition counselling is associated with reduced stunting prevalence and improved feeding practices in early childhood: A post-program comparison study. *Nutrition Journal*, 18(1), 1–9.

- <https://doi.org/10.1186/s12937-019-0473-z>
- Rahayu, A., Yulidasari, F., Putri, A. O., & Anggraini, L. (2018). Study Guide - Stunting dan Upaya Pencegahannya. In *Buku stunting dan upaya pencegahannya*. CV Mine.
- Ringgi, M. S. I. N., & Keuytimu, Y. M. H. (2022). Intervensi Berbasis Edukasi pada Ibu terhadap Feeding Practice Ibu dalam Upaya Peningkatan Status Gizi Anak Stunting pada Usia 6-24 Bulan. *Jurnal Kesehatan*, 13(1), 118. <https://doi.org/10.26630/jk.v13i1.2852>
- Satriawan, E. (2018). Strategi Nasional Percepatan Pencegahan Stunting 2018-2024 (National Strategy for Accelerating Stunting Prevention 2018-2024). *Tim Nasional Percepatan Penanggulangan Kemiskinan (TNP2K) Sekretariat Wakil Presiden Republik Indonesia*, November, 1–32. http://tnp2k.go.id/filemanager/files/Rakornis_2018/Sesi_1_01_RakorStuntingTNP2K_Stranas_22Nov2018.pdf
- Sirajuddin, Sirajuddin, S., Razak, A., Ansariadi, Thaha, R. M., & Sudargo, T. (2021). The intervention of maternal nutrition literacy has the potential to prevent childhood stunting: Randomized control trials. *Journal of Public Health Research*, 10(2), 365–369. <https://doi.org/10.4081/jphr.2021.2235>
- Utami, R. A., & Juliani, E. (2020). Mental, Social-Psychological Stimulation and Nutritional Supplementation Affects Stunting Incidence among Children in Indonesia. *Jurnal Kesehatan Holistic*, 4(1), 34–51. <https://doi.org/10.33377/jkh.v4i1.72>
- WHO. (2018). *Reducing stunting in children: equity considerations for achieving the Global Nutrition Targets 2025*. <https://www.who.int/publications/i/item/9789241513647%0A> Accessed on 18th February 2022
- WHO, & UNICEF. (2020). *Levels and trends in child malnutrition*. <https://www.who.int/publications/i/item/9789240025257>

