

# IMPACT OF ENVIRONMENTAL SANITATION AND INFECTION DISEASE AS A DETERMINING STUNTING FACTOR FOR CHILDREN

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**ABSTRACT:** Stunting is a condition of a toddler where the length / height of the child is below the standard age of the child. According to the World Health Organization (WHO), Indonesia is among the third countries with the highest prevalence of stunting in the South-East Asia Regional (SEAR) region. In 2015-2017 the average prevalence of stunting toddlers in Indonesia is 36.4% and this prevalence tends to be static. Environmental sanitation and infectious diseases are one of the determinants of stunting in children under five. Poor sanitation will be associated with an increased risk of infectious diseases that can cause stunting of children under five. If this stunting is not handled, it will cause problems for future generations, especially mental development and physical growth will be disrupted, and it will end in poverty and the threat of survival, thus requiring appropriate intervention in its handling.

*Keywords: Environmental sanitation, infectious disease, stunting*



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## 1. INTRODUCTION

Stunting is a condition of a toddler where the length/height of the child is below the standard age of the child. Physically stunting toddlers are shorter than other normal toddlers who are the same age. Stunting is a result of long-term nutritional deficiencies due to lack of intake and recurrent disease infections. Stunted children tend to be at greater risk of suffering from illness or easily ill, experience mental development barriers, experience intelligence disorders, have low school performance, and are at greater risk of death [1] [2].

Stunting is one of the nutritional problems in the world today. The incidence of stunting in the world in 2017 was 22.2% or around 150.8 million children under five in the world experienced stunting. Compared to the stunting rate in 2000 it has decreased by 32.6%. Of the 83.6 million stunting toddlers in Asia, 58.7% originating from South Asia is the highest proportion and 0.9% originating from Central Asia is the smallest proportion [3] [4].

According to the World Health Organization (WHO), Indonesia is among the third countries with the highest prevalence of stunting in the South-East Asia Regional (SEAR) region. In 2015-2017 the average prevalence of stunting toddlers in Indonesia is 36.4% and this prevalence tends to be static. The results of the Basic Health Research stated that the prevalence of Stunting in Indonesia in 2007 was

36.8% and in 2010 it slightly decreased by 35.6%. But in 2013 it increased to 37.2%.

## 2. IMPACT OF ENVIRONMENTAL SANITATION AND INFECTION DISEASE AS A DETERMINING STUNTING FACTOR FOR CHILDREN

The socio-economic and sanitation conditions of residence are also related to stunting. Economic conditions are closely related to the ability to meet nutritious intake and health services for pregnant women and toddlers. While food sanitation and safety can increase the risk of infectious diseases. Based on data from the Joint Child Malnutrition Estimates in 2018, countries with middle to upper income can reduce stunting rates up to 64%, whereas in middle to lower countries only reduce around 24% from 2000 to 2017. In countries with low incomes it actually has increased in the year 2017.

Infectious diseases caused by hygiene and poor sanitation (eg diarrhea and worms) can interfere with the absorption of nutrients in the digestive process. Some infectious diseases suffered by infants can cause the baby to lose weight. If this condition occurs in a long time and is not accompanied by giving adequate intake for the healing process, it can lead to stunting. In 2017, 72.04% of households in Indonesia had access to

improved drinking water sources. The province with the highest percentage was Bali (90.85%), while the lowest percentage was Bengkulu (43.83%). There are still 20 provinces that are below the national percentage. The intended source of drinking water is protected drinking water including tap water (tap), public tap, public hydrant, water terminal, rainwater collection (PAH) or spring and protected well, well bore or pump, which are at least 10 meters apart from sewage disposal, waste collection, and garbage disposal. Excluding bottled water, water from traveling vendors, water sold through tanks, well water and unprotected springs. In Indonesia, poor sanitation is an important issue related to the increased risk of infectious diseases that can cause stunting.

Kruskal Wallis test results showed no significant differences between the incidence of illness, frequency of illness, duration of illness, and environmental sanitation in the lowland ecosystem zone, medium plains, and mountains. The average difference in environmental sanitation is highest in lowland ecosystem zones than other ecosystem zones. The condition of the physical environment and sanitation around the house greatly affect the health of residents of the house, including the nutritional status of children under five. Stunting of children reduces survival and impairs nerve development.

**Environmental Sanitation** The probability or chance of a toddler experiencing a stunting event due to inadequate sanitation is 1,381, meaning that a toddler with environmental sanitation has a 4 times greater chance of stunting compared to good environmental sanitation. [5-8] India stated that poor environmental sanitation behavior in the case of open defecation (BABS) was the determining factor for stunting. Stunting can be prevented by increasing access to clean water and sanitation facilities, and maintaining environmental cleanliness. Children with less environmental sanitation will have a greater chance of stunting than children with adequate and good environmental sanitation in the zone ecosystems of the plains and mountains. The availability of clean water is also related to bowel habits. Low rainfall conditions and difficult geographical conditions add to the limitations of the community to get access to clean water, so that water becomes a material that is difficult to obtain in mountainous areas. Clean water prevents the development of diseases which together with sanitation and hygiene affect the health of nutritional status especially malnutrition [9-11]. This research is in line with [12] which states the condition of the physical environment and sanitation around the house greatly affect the health of residents of the house. An environment that does not meet health requirements allows various types

of diseases including diarrhea, intestinal worms, ARI and gastrointestinal infections. The condition of the house has a significant effect on the nutritional status of children under five [13-20].

Good environmental sanitation can protect children against stunting [21-25]. Low sanitation and environmental hygiene trigger digestive disorders, which make energy for growth diverted to the body's resistance to infection [26]. Poor environmental health has the potential to cause infectious diseases which will ultimately have an impact on nutritional problems [27]. Clinical infections cause slow growth and development [28], whereas children who have a history of infectious diseases have a chance of experiencing stunting [28].

### 3. CONCLUSION

Environmental sanitation and infectious diseases are one of the factors determining stunting of children under five. To overcome the problem of stunting, children under five need appropriate interventions such as increased counseling, counseling and learning to the community by all stakeholders about health hygiene practices, Clean and Healthy Behavior practices so as to enable the creation of good environmental sanitation conditions and avoid the threat of infectious diseases originating from environment.

### 4. REFERENCES

- [1] Anggraini H, Sari SM, Razak A, Dewata I. Environmental Sanitation and Health "Nasi Sek" (Seribu Kenyang) Restaurant in Gandorh Beach Pariaman City. IOP Conference Series: Earth and Environmental. Vol.448(1). 2020
- [2] Apriatin Y, Hermon D, Barlian E, Dewata I and Umar I. Policy Direction for AHP-Based Community Nutrition Management Post Eruption of Dempo Volcano, Pagar Alam City-Indonesia. International Journal of Management and Humanities (IJMH). 4(9). 610. 2020
- [3] Archer S. Staying focused on the undernourished child India. J Americ Diet Assoc 107:1879-1887. 2007
- [4] Arifin DZ, Irdasari SY, Sukandar H. Analisis sebaran dan faktor risiko stunting pada balita di Kabupaten Purwakarta, Bandung. Bandung: Komunitas Epidemiologi Fakultas Kedokteran Universitas Padjajaran. 2012
- [5] Hastuti D, Sebho K, Lamawuran YL. Hubungan karakteristik sosial ekonomi rumah tangga dengan pemenuhan hak anak di wilayah dampingan Plan International Indonesia Program Unit Sikka, Nusa Tenggara Timur. JIKK 3(2):154-163. 2010

- [6] Hermon, D., Putra, A and Oktorie, O. Suitability Evaluation of Space Utilization Based on Environmental Sustainability at The Coastal Area of Bungus Bay in Padang City, Indonesia. *International Journal*, Vol.14, No.41, pp. 193-202. 2018
- [7] De Silva, I., & Sumarto, S. Child malnutrition in Indonesia: Can Education, Sanitation and Healthcare Augment the Role of Income? *Journal of International Development*, 30(5), 837–864. <https://doi.org/10.1002/jid.3365>. 2018
- [8] de Onis, M., & Branca, F. Childhood stunting: A global perspective. *Maternal and Child Nutrition*, 12, 12–26. <https://doi.org/10.1111/mcn.12231>. 2016
- [9] Damanik MR, Ekayanti I, Hariyadi D. Analisis pengaruh pendidikan ibu terhadap status gizi balita di Provinsi Kalimantan Barat. *J Gizi Pangan* 5(2):69-77. 2010
- [10] Dewey KG, Mayers DR. Early child growth: how do nutrition and infection interact?. Blackwell Publishing Ltd. *Maternal and Child Nutrition* (2011),7 (Suppl.3), pp.129–142 <http://onlinelibrary.wiley.com/journal>. 2011
- [11] Efevbera, Yvette; Bhabha, Jacqueline; Farmer, Paul E.; Fink, Günther. Girl Child Marriage as a Risk Factor For Early Childhood Development and Stunting *Social Science & Medicine* Volume: Issues: S0277953617303283. Publisher: Elsevier Science. DOI: 10.1016/j.soescimed.2017.05.027. 2007
- [12] Fregonese F, Impact of contaminated household environment on stunting in children aged 12-59 months in Burkina Faso. 2017
- [13] *J Epidemiol Community Health*. Apr. 71(4): 356-363. doi: 10.1136/jech-2016-207423. Epub 2016 Dec 16. 2017
- [14] Fink G, Günther I, Hill K. The effect of water and sanitation on child health: evidence from the demographic and health surveys 1986–2007. *Int J Epidemiol* 40: 1196–1204. Hanum. 2011
- [15] Firmanu Cahyono, Stefanus Pieter Manongga, Intje Picauly, Stunting determinants of under five years children in various ecosystem zones in Kupang, Vol 11, Nomor 1, Maret 2016
- [16] Headey, D., Nguyen, P., Kim, S., Rawat, R., Ruel, M., & Menon, P. Is Exposure to Animal Feces Harmful to Child Nutrition and Health Outcomes ? A Multicountry Observational Analysis. *The American Journal of Tropical Medicine and Hygiene*, 96(4), 961–969. <https://doi.org/10.4269/ajtmh.16-0270>. 2017
- [17] Hussein. Thresholds of socio economic and environmental conditions necessary to escape from childhood malnutrition: a natural experiment in rural Gambia. *Nov 1;16(1):199*. 2018
- [18] Jean H Humphrey, Mduduzi N N Mbuya, Robert Ntazini, dkk, Independent and combined affects of improved water, sanitation, and hygiene, and improved complementary feeding, on child stunting and anemia in rural Zimbabwe a cluster-randomised trial, vol 7 Jan 2019
- [19] Kemenkes RI. Riset Kesehatan Dasar (Riskesdas 2013). Jakarta: Badan Penelitian dan Pengembangan Kesehatan Kemenkes RI. 2013
- [20] Kavosi E, Rostami ZH, Kavosi Z, Nasihatkon A, Moghadami M, Heidari M. Prevalence and determinants of under-nutrition among children under six: a cross-sectional survey in Fars province. *Iran Int J Health Policy Manag* 3(2):71-76. 2014
- [21] Muhammad Fikru Rizala, Eddy van Doorslaerb. Explaining the Fall of Socioeconomic Inequality in Childhood Stunting in Indonesia. *SSM – Population Health journal homepage: http://www.elsevier.com/locate/ssmph* SSM - Population Health 9 (2019) 100469. 2019
- [22] Merchant AT, Jones C, Kiure A, Kupka R, Fitzmaurice G, Hererra MG, Fawzi WW. Water and Sanitation associated with improved child growth. *Eur J Clin Nutr* 5 (12):1562-1568. 2003
- [23] Milman A, Frongillo EA, de Onis M. Hwang JY. Differential improvement among countries in child stunting is associated with long-term development and specific intervention. *J Nutr* 135:1415-1422. 2005
- [24] Nurliyana, Abdul Razak; Mohd Shariff, Zalilah; Mohd Taib, Mohd Nasir; Gan, Wan Ying; Tan, Kit-Aun. Early Growth and Home Environment are Associated With Cognitive Development in the First Year of Life of Malaysian Infants, *Early Human Development* Volume: 140 Issues: 104890. Elsevier Science DOI: 10.1016/j.earlhumdev.2019.104890. 2010
- [25] Picauly I, Toy SM. Analisis determinan dan pengaruh stunting terhadap prestasi belajar anak sekolah di Kupang dan Sumba Timur, NTT. *J Gizi Pangan* 8(1):55-62. 2013
- [26] Putri DS, Sukandar D. Keadaan rumah, kebiasaan makan, status gizi, dan status kesehatan balita di Kecamatan Tamansari, Kabupaten Bogor. *J Gizi Pangan* 7(3):163168. 2012
- [27] Rachmi, Agho, Li, & Baur. Stunting, Underweight and Overweight in Children Aged 2.0-4.9 Years in Indonesia: Prevalence Trends and Associated Risk Factors. *PLoS One*, 11(5), 1–17 <https://doi.org/10.1371/journal.pon.e0154756>. 2016