

Review of Factors Influencing the Impact of Access to Sanitation Facilities on Stunting

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ABSTRACT

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Stunting is a condition where a child's height is not appropriate for their age. In 2022, an estimated 21.6% of children under the age of 5 in Indonesia were affected by stunting. Stunting is a complex nutritional problem influenced by various factors, including the environment. Several studies have examined the relationship between household hygiene and sanitation factors and growth retardation in young children. The aim of this research is to analyze the risk factors associated with personal hygiene and sanitation practices of parents or guardians within households in Indonesia. The research methodology employed in this study is a literature review. A total of 20 selected articles from the Garuda Jurnal and Sinta databases between 2019 and 2022 were evaluated based on publication criteria, namely freely available original research articles where at least one variable analyzed hygiene and sanitation in relation to child growth. The findings of this research were synthesized using the PRISMA method. The articles were grouped based on similar findings to address the research question. This study found that handwashing, access to clean water, toilet sanitation, and the occurrence of diarrhea were associated with the risk of stunting. The conclusion drawn from this research is that most studies indicate a relationship between personal hygiene and sanitation facilities and the occurrence of stunting. For future research, the use of systematic reviews and meta-analyses is recommended.

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1. INTRODUCTION

Stunting has become a significant nutritional problem in toddlers that has gained global attention in recent years, particularly in low- and middle-income countries, including Indonesia (Bukusuba et al., 2017; Hossain et al., 2017; Ministry of Health of Indonesia, 2018). Stunting refers to linear growth impairment (height/length-for-age) that falls below -2 Standard Deviations (<-2 SD) according to the World Health Organization (WHO) median standards. This occurs due to chronic malnutrition and repeated infections during the first 1,000 days of life [1,2].

According to the WHO definition, stunting is characterized by a child's height that is below the established standard deviation (< -2 SD) [3]. According to the World Health Organization (WHO), stunting is a growth disorder in children caused by chronic malnutrition and repeated infections during the first 1,000 Days of Life (DOL). Data from the WHO indicates that globally, there are 155 million children under five years old who experience stunting [4]. The results of the Global Nutrition Report in 2022 showed a decrease of 2.8% in the stunting rate in Indonesia, from 24.4% in 2021 to 21.6% in 2022. The Indonesian government has set a target to reduce the national stunting rate to 17.8% in 2023 and 14% in 2024. According to the 2022 Global Nutrition Report, there are 18 provinces in Indonesia with stunting rates above the national average of 21.6%. The province with the highest stunting rate is East Nusa Tenggara (NTT) with a percentage of 35.3% [5].

The problem of stunting in children under five has a very negative impact. This can cause health problems, stunted physical growth, impaired mental and cognitive development, and can even lead to death. Disorders caused by stunting are irreversible, meaning that they are difficult to return to their original state, and can have long-term effects on a child's development when they become adults [6].

Stunting in children under five is not only a matter of nutrition or physical growth, but also has a broad impact on the health and development of children as a whole. Efforts to prevent and treat stunting need to be carried out seriously and comprehensively in order to reduce the adverse effects it causes [7].

There are several factors that also play a role in the risk of stunting, such as parenting style and children's health, including the frequent incidence of infectious diseases. Socio-economic conditions of the family, the surrounding environment such as sanitation and use of clean water also play an important role. The availability of proper clean water is a factor that greatly influences the risk of stunting in children under five [7]. In Indonesia, the availability of adequate clean water and the habit of boiling drinking water can reduce the possibility of disease outbreaks such as diarrhea. There are still challenges in terms of access to sufficient clean water in several areas, as well as the habit of cooking drinking water that is not consistently practiced in the community [8].

A study conducted by the National Social and Economic Survey (Susenas) in 2018 found a negative relationship between increasing access to clean water and improving environmental sanitation with stunting rates in children under five. The survey shows that improved sanitation and adequate access to clean water can reduce the risk of stunting and prevent death in children under five [9].

The importance of paying attention to and overcoming the problem of access to adequate clean water and improving environmental sanitation as a whole can involve collaborative efforts between the government, the community and the sector in increasing awareness, knowledge and good practices related to the use of clean water and sanitation. These steps will contribute to efforts to reduce the risk of stunting in children under five and improve their health and quality of life [10].

This review aims to evaluate recent research findings regarding the relationship between environmental sanitation and the occurrence of stunting in the community.

2. METHOD

The process of preparing this literature review involved searching for research articles on the Garuda Rujukan Digital (Garuda) electronic database provided by the Indonesian Ministry of Education, Culture, Research and Technology. The article search was conducted using the keywords "Sanitation, Stunting, Nutrition". Articles published within 2019-2023 were selected for review.

The inclusion criteria for journal selection were as follows: studies using the keywords "Sanitation, Stunting, Nutrition", articles published between 2019-2022, and articles available in full text. Articles that have a high risk of bias will be excluded from the synthesis.

Once the articles that meet the inclusion criteria have been found, the article synthesis steps are carried out as follows:

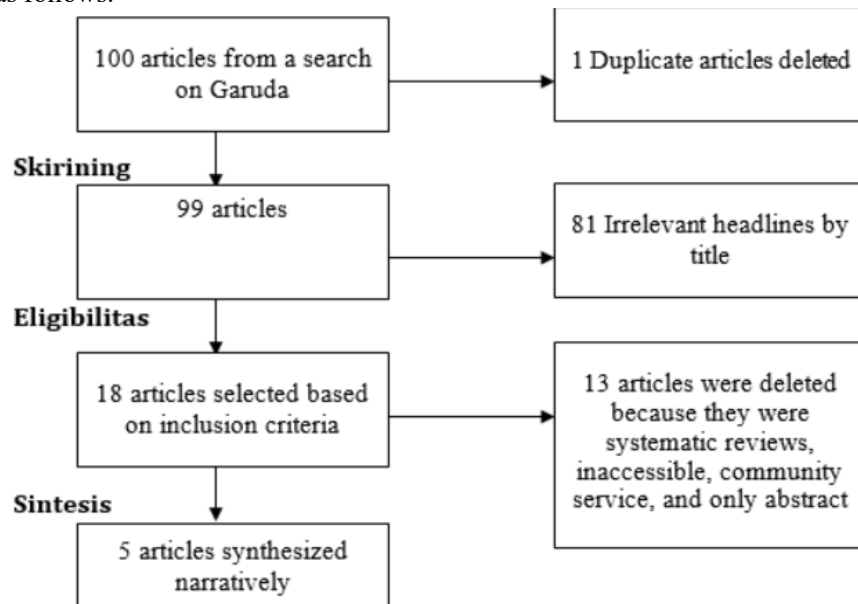


Figure 1. Identification Article Synthesis Steps

3. RESULTS AND DISCUSSION

Table 1. The systematic review results

No	Researcher	Year	Title	Result
1.	Sari, Hesti Permata et al [11]	2022	Hubungan keragaman asupan protein hewani, pola asuh makan, dan higiene sanitasi rumah dengan kejadian stunting	Multivariate test shows that the diversity of animal protein intake and household sanitation hygiene simultaneously affect the incidence of stunting ($p=0.038$, $r^2=0.102$).
2.	Ainin et al [12]	2023	Hubungan pendidikan ibu, praktik pengasuhan dan sanitasi lingkungan dengan kejadian stunting pada balita di desa lokus stunting wilayah kerja puskesmas paron kabupaten ngawi.	There is a relationship between mother's education ($p = 0.002$, $OR = 4.429$), parenting practices ($p = 0.001$, $OR = 6.833$), and environmental sanitation ($p = 0.042$, $OR = 4.529$) with the incidence of stunting
3.	Ramdaniati et al [13]	2019	Hubungan karakteristik balita, pengetahuan ibu dan sanitasi terhadap kejadian stunting pada balita di kecamatan labuan kabupaten pandeglang	There is a significant relationship between Low Birth Weight (LBW), mother's knowledge, latrine ownership and water sources to the incidence of stunting in toddlers in Labuan District.
4.	Hasan et al [14]	2019	Akses ke Sarana Sanitasi Dasar sebagai Faktor Risiko Kejadian Stunting pada Balita Usia 6-59 Bulan	The results of the multivariate analysis found two variables related to the incidence of stunting, namely access to healthy latrines $OR=5.99$ (95% CI: 2.98-9.23), access to clean water sources $OR=5.99$ (95% CI: 3.31-10.83), after controlling for the variable history of infectious diseases, history of giving complementary foods and history of growth monitoring
5.	Dewi et al [15]	2020	Perilaku Higiene dan Sanitasi Meningkatkan Risiko Kejadian Stunting Balita Usia 12-59 bulan di Banten	Subjects with poor hygiene had a risk of stunting ($p=0.000$; $OR=27.28$), as well as poor environmental sanitation had a positive and moderate correlation with stunting ($p=0.000$; $r=0.511$). The stunted toddler group tended to have poorer hygiene behavior and environmental sanitation conditions than the non-stunted group

The systematic review results indicate that the majority of studies have found a relationship between water and sanitation factors and an increased incidence of stunting in toddlers in Indonesia. Inadequate environmental sanitation and poor hygiene practices can indirectly contribute to stunting in children. Poor hygiene practices can increase the risk of infection in children. The components that determine the quality of environmental sanitation include sanitation facilities, house conditions, and behavior. Factors such as the availability of clean water, hygienic food processing, and proper waste management are crucial in preventing stunting in children [11,12,13,14,15].

Descriptive analysis results show that the majority of households with both normal nutritional status children (66.7%) and stunted children (77.3%) have low sanitation. Most respondent families dispose of waste in open drains. Interviews and observations in the study also indicate that the majority of respondent families do not have integrated waste management, leading them to dispose of waste in drains or burn it (Risksedas, 2018).

Based on the study by Jawil et al., 2019, which discusses the risk factors for stunting, particularly in relation to total sanitation, it can be concluded that open defecation behavior caused by a lack of access to proper toilet facilities is closely associated with a high incidence of diarrhea, which can affect the growth and development of toddlers. Therefore, it is important for every family to have proper toilet facilities. This is because open defecation behavior can lead to the emergence of environmental enteropathy, which is the main cause of undernutrition in children in the form of subclinical small intestinal disorders. Environmental enteropathy can damage the villi in the large intestine, making nutrient absorption difficult. This is prone to causing chronic diarrhea and ultimately resulting in inadequate nutrient intake, leading to long-term malnutrition, namely stunting [13].

A proper toilet is an effective solution to break the chain of disease transmission. Every family should have and use easily accessible proper toilets, both inside and outside the house, in accordance with the guidelines of the Indonesian Ministry of Health in 2018. Every family member is expected to use the toilet for defecation and urination. The use of toilets provides benefits in maintaining cleanliness, health, and preventing unpleasant odors in the environment. Toilets also protect water sources from contamination. With the presence of toilets, flies and insects that can transmit diseases such as diarrhea, cholera, dysentery, typhoid, intestinal worms, digestive system diseases, skin diseases, and poisoning can be prevented [16,17].

The relationship between sanitation and stunting is supported by the research conducted by Hasan et al., 2018, which examined the access to basic sanitation facilities as a risk factor for the occurrence of stunting in children aged 6-59 months. Households without access to proper toilets have a 5.25 times higher risk of stunting compared to families with access to proper toilets. This finding remains relevant after controlling variables such as access to clean water sources, history of infectious diseases, complementary feeding practices (MPASI), and growth monitoring.:

The presence of clean water and the habit of cooking drinking water can also reduce the risk of diarrhea outbreaks, as the lack of access to clean water and the habit of consuming boiled water can contribute to such outbreaks. A study conducted by Hasan et al. in 2019 demonstrated a negative correlation between increased access to clean water and improved sanitation with the occurrence of stunting and child mortality [14]. Based on the findings of Dewi et al. in 2020, which examined the risk factors for stunting related to the pillar III of household drinking water and food management (PAMM-RT), it can be concluded that poor hygiene practices can make children more vulnerable to diarrhea and result in the loss of essential nutrients needed for growth. Food contamination and infectious diseases can also have a negative impact on children's health [15]. Hygiene and sanitation play a crucial role in determining food quality, where the presence of *Escherichia coli* as one of the indicators of food contamination can lead to foodborne illnesses. The presence of *E. coli* in food and beverages can indicate contamination due to poor handling of the food and beverages. Therefore, it is important to focus on addressing the risk of stunting through efforts to empower access to clean water and proper sanitation for the Indonesian population (Olo et al., 2021; Syam et al., 2020[18,19]).

From the results of research by Ainin et al, 2013, factors of poor environmental sanitation including inadequate clean water, use of unhealthy toilet facilities, and poor hand washing behavior greatly contribute to infectious diseases. These conditions will cause linear growth disorders and can increase mortality in children under five. Adequate sanitation needs to be obtained by all people in Indonesia, with proper sanitation it will slow down the occurrence of stunting in toddlers, where with clean water, there will be no infectious diseases that cause growth disturbances in toddlers. However, in reality the distribution of decent clean water is not evenly distributed resulting in only people with middle and upper economies who get access to clean water [20]. Thus, it is very difficult for people with a low economy to get proper clean water, so that children under five who experience poverty generally often experience stunting compared to children under five whose economic condition is high [10].

In controlling the risk factors for stunting, important improvement measures include enhancing and maintaining basic sanitation facilities, such as household toilets and clean water facilities, as well as practicing good hygiene and healthy behavior (PHBS) [9]. All of these factors need to be carefully considered and implemented in an integrated manner to reduce the risk of stunting and improve the health of children.

4. CONCLUSION

According to recent research, there is an important link between keeping the environment clean and slowing down the growth of children under the age of 5. Poor sanitation, including limited access to clean water, inadequate sanitation, and poor hygiene practices, can increase the risk of stunting. Improved environmental hygiene, including access to adequate clean water and good hygiene practices, can be effective in reducing child stunting. Research shows that increasing access to clean and safe water and better sanitation can reduce the risk of stunting and prevent death in children under five.

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