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Predictions Models of Preventive Health Effort Coverage With Stunting Prevalence in Toddlers, Indonesia

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Abstract
The achievement of stunting reduction in Indonesia is still below the national target. The low coverage of preventive health efforts in several regions is one of the causes of the high prevalence of stunting in Indonesia. The purpose of this study is to analyze the modeling of the coverage of preventive health efforts with the prevalence of stunting in toddlers in Indonesia. A type of analytical descriptive research with a cross-sectional design. The research data is sourced by Indonesian Health Profile, 2023. The collected data was then processed and analyzed using simple and multiple regression statistical tests. There was a linear relationship between coverage of complete basic immunization, monitoring the growth of child, implementation of GERMAS, and proper sanitation with the prevalence of stunting in toddlers in Indonesia (p-value ≤ 0.05). The coverage of monitoring the growth of child and proper sanitation was feasible to significantly predict the prevalence of stunting in toddlers in Indonesia (p-value ≤ 0.05) with the regression model equation being stunting = 55.837-0.211*CMGT-0.209*CPSA. The increasing coverage of monitoring the growth of child and proper sanitation was predicted to further reduce the prevalence of stunting in child in Indonesia. There is a need to improve the coverage of monitoring the growth of child and proper sanitation, especially in low-coverage areas through an integrative and comprehensive approach that involves the active participation of the government, communities, and other sectors.

Keywords: preventive health service, stunting, toddlers, Indonesia

INTRODUCTION

Stunting or dwarfism is a growth and development disorder caused by acute malnutrition and repeated infection and with signs of height being in the position – (minus) 2 standard deviations (<-2 Standard Deviations) of the *Child Growth Standard.*[1] [2] Stunting can have a bad impact on toddlers in the short and long term. Short-term impact; increasing morbidity and death, suboptimal cognitive, motor, and verbal development of children, and increasing health costs. Meanwhile, the long-term impact; Posture in adulthood is less than optimal (shorter than usual), increased risk of obesity and other diseases, decreased reproductive health, less than optimal learning capacity and achievement in

[1] Sri Melfa Damanik, Dessie Wanda, and Happy Hayati, "Feeding Practices for Toddlers with Stunting in Jakarta: A Case Study," *Pediatric Reports* 12, no. 1 (2020): 18–22, https://doi.org/10.4081/pr.2020.8695.
[2] Molla Kahssay et al., "Determinants of Stunting among Children Aged 6 to 59 Months in Pastoral Community, Afar Region, North East Ethiopia: Unmatched Case Control Study," *BMC Nutrition* 6, no. 1 (2020): 1–8, https://doi.org/10.1186/s40795-020-00332-z.

school, and less than optimal productivity and work capacity. [3] [4]

Stunting is one of the global health problems that can hinder development and cause high rates of illness and premature death in children under the age of five, especially in developing countries. [5] [6] Globally, the prevalence of stunting in toddlers reaches approximately 162 million. The West and Central Africa, East and South Africa, and South Asia regions are countries with a very high prevalence of stunting. Indonesia is the fifth country with the highest prevalence of stunting after India, China, Nigeria, and Pakistan. [7] [8]

The prevalence of stunting among toddlers in Indonesia in the last 10 years shows that there has been no significant decrease. Based on data from the Indonesian of Ministry Health, the prevalence of stunting in toddlers in 2023 is 21.5%. The province with the highest prevalence of stunting in toddlers is Central Papua (39.4%), while the lowest is Bali (7.2%). Based on the 2023 Indonesian Health Survey (SKI), the prevalence of stunting toddlers in Indonesia decreased by 0.1% compared to the 2022 Indonesian Nutrition Status Study (SSGI), to 21.5%. [9] [10] As an effort to reduce stunting in Indonesia, the government issued a policy of Presidential Regulation No. 72 of 2021 concerning the acceleration of stunting reduction. One of the strategies for accelerating stunting reduction is carried out through increasing preventive health efforts. [11] [12]

Stunting preventive health efforts aim to reduce the risk and impact of stunting through efforts to identify risk factors and interventions to prevent stunting problems from developing further. Some of the preventive health efforts organized by the government of the Republic of Indonesia to reduce the prevalence of stunting include: 1) Complete Basic Immunization is the provision of vaccinations for infants and children to protect against diseases; 2) Supplementary feeding is the provision of food to children/toddlers who need additional nutrition to meet nutritional needs; 3) Monitoring the growth of child is a series of activities consisting of weighing, filling out KMS (Cards Towards Healthy), growth assessment, and follow-up of each case of disorders; 4) Exclusive breastfeeding is the full breastfeeding of babies from birth to the age of 6 months, 5) Supplementary of Vitamin A is the provision of supplements or foods containing vitamin A to meet the needs of the body; 6) Implementation of Healthy Living Community Movement (GERMAS) is an activity to encourage people to implement a healthy lifestyle, 7) Open Defecation Free (ODF) village is a village that implements the behavior of not defecating; 8) Community-Based Total Sanitation (STBM) village is a village that implement to manage sanitation independently with the aim of improving health and quality of life, 9) Livable home is a home condition that meets the standards for a safe, comfortable, and healthy place to live for its residents and 10) Proper sanitation is an effort to provide qualified

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[3] Wahidah Rohmawati, Oktia Woro Kasmini, and Widya Hary Cahyati, "The Effect of Knowledge and Parenting on Stunting of Toddlers in Muna Barat, South East Sulawesi," *Public Health Perspectives Journal* 4, no. 3 (2019): 224–31, http://journal.unnes.ac.id/sju/index.php/phpj.

[4] Ashraf Soliman et al., "Early and Long-Term Consequences of Nutritional Stunting: From Childhood to Adulthood," *Acta Biomedica* 92, no. 1 (2021): 1–12, https://doi.org/10.23750/abm.v92i1.11346.

[5] Damanik, Wanda, and Hayati, "Feeding Practices for Toddlers with Stunting in Jakarta: A Case Study."

[6] Munazza Batool et al., "Relationship of Stunting with Water, Sanitation, and Hygiene (WASH) Practices among Children under the Age of Five: A Cross-Sectional Study in Southern Punjab, Pakistan," *BMC Public Health* 23, no. 1 (2023): 1–7, https://doi.org/10.1186/s12889-023-17135-z.

[7] WHO, "Global Nutrition Targets 2025: Stunting Policy Brief," WHO, 2022, https://www.who.int/publications/i/item/WHO-NMH-NHD-14.3.

[8] UNICEF, "Child Malnutrition," 2023, https://data.unicef.org/topic/nutrition/malnutrition/.

[9] Kemenkes RI, *Profil Kesehatan Indonesia* (Jakarta: Kemenkes RI, 2023), https://www.kemkes.go.id/id/profil-kesehatan-indonesia-2023.

[10] Kemenkes RI, "Survei Kesehatan Indonesia (SKI)" (Jakarta, 2023), 1–965, https://www.badankebijakan.kemkes.go.id/ski-2023-dalam-angka/.

[11] Lagiono Lagiono et al., "Evaluasi Layanan Layanan Kesehatan Lingkungan Sebagai Intervensi Spesifik Untuk Mendukung Akselerasi Penurunan Stunting," *Link* 19, no. 1 (2023): 34–42, https://doi.org/10.31983/link.v19i1.9428.

[12] Nuryanto and Lagiono, "Analisis Pemodelan Capaian Sarana Sanitasi Dasar Rumah Dengan Kejadian Stunting Pada Balita," *BUletin Keslingmas* 42, no. 03 (2023): 147–52.

sanitation facilities including the provision of clean water, fecal disposal, waste and wastewater treatment. [13] [14]

However, the stunting reduction acceleration strategy implemented is not optimal because the reduction in stunting prevalence in toddlers is still below the target set by the government. This condition is due to the low coverage of preventive efforts in several regions. Based on data from the Indonesian Health Profile in 2021-2023, shows that several preventive health efforts to reduce the prevalence of stunting in several areas are still below the national average. [15] [16] The problem of stunting needs to be handled that involves cross-sectoral and dimensional as well as the role of various parties in the prevention and control of stunting in Indonesia. [17] About this background, it is necessary to study preventive health efforts to reduce stunting in toddlers carried out in Indonesia. The results of the study can be input in planning to accelerate stunting reduction in toddlers through priority preventive health efforts.

METHOD

This type of analytical descriptive research uses *a cross-sectional* study design. The research is sourced from Indonesian health data in 2023. The purpose of the study was to analyze the modeling of the coverage of preventive health efforts with the prevalence of stunting in toddlers in Indonesia. Independent variables are preventive health efforts including complete basic immunization, supplementary feeding, monitoring the growth of child, exclusive breastfeeding, supplementary Vitamin A, implementation of GERMAS, ODF Village, STBM Villages, livable homes, and proper sanitation. The dependent variable is the prevalence of stunting in toddlers in Indonesia. Data analysis used simple and multiple regression tests. A simple regression test is to predict the linear relationship between the preventive health effort coverage and the prevalence of stunting in toddlers in Indonesia. The multiple linear regression test (ENTER Method), is to predict the variable that has the most significant linear relationship. The multiple linear regression test requirement is a variable that has a *p-value* of ≤ 0.25 entered into the test. [18]

RESULT & DISCUSSION

Stunting is still a serious problem that has an impact on the health of children and the community. Efforts are made to reduce the prevalence of stunting through preventive health efforts. In its implementation, it is still not optimal, because there is a gap in coverage of preventive health efforts in several areas which has an impact on the high prevalence of stunting in Indonesia.

TABLE. 1. Distribution of Frequency of Coverage of Preventive Efforts and Prevalence of Stunting in Indonesia, 2023

Coverage	Min-Max (%)	Mean (%)	SD (%)
Complete Basic Immunizations	41,5-112,2	90,7	14,4
Supplementary feeding	60,1-99,0	87,9	8,22
Monitoring the growth of toddlers	51,7-97,8	76,5	11,5
Exclusive breastfeeding	10,9-81,1	57,2	17,4
Supplementary of Vitamin A	35,3-101,3	85,7	14,5
Implementation of GERMAS	16,7-100,0	74,7	31,4
ODF Villages	30,0-100,0	67,9	22,2
STBM Villages	54,4-100,0	89,9	11,4
Livable Homes	29,0-85,8	62,5	12,6
Proper Sanitation	43,0-96,4	82,6	9,4
Prevalence of Stunting in Toddlers	7,2-37,9	22,4	6,0

Sumber : Profil Kesehatan Indonesia, 2023

[13] Kemenkes RI, *Profil Kesehatan Indonesia*.

[14] Kemenkes RI, "Survei Kesehatan Indonesia (SKI)."

[15] Kemenkes RI., *Profil Kesehatan Indonesia*, *Pusdatin.Kemenkes.Go.Id*, 2021.

[16] Kemenkes RI, *Profil Kesehatan Indonesia*.

[17] Widya Hari Cahyati et al., "Kajian Stunting Di Kota Semarang," *Jurnal Riptek* 13, no. 2 (2019): 101–6, http://riptek.semarangkota.go.id.

[18] Susanto Priyo Hastono, *Analisa Data Bidang Kesehatan*, 1st ed. (Jakarta: Rajawali Pers, 2016).

Based on table 1, shows that the average coverage of preventive health efforts in Indonesia which includes: complete basic immunization by 90.7% (min-max 41-5%-112.2%; SD 14.4%), supplementary feeding by 87.9% (min-max 60.1%-99.0%; SD 8.22%), Exclusive Breastfeeding by 57.2% (min-max 10.9%-81.1%; SD 17.4%), supplementary of vitamin A by 87.5% (min-max 35.3%-101.3%; SD 14.5%), implementation of GERMAS by 74.7% (min-max 16.7%-100.0%; SD 31.4%), ODF Village by 67.9% (min-max 30.0%-100.0%; SD 22.2%), STBM village by 89.9% (min-max 54.4%-100.0%; SD 11.4%), livable home by 62.5% (min-max 29.0%-85.8%; SD 12.6%) and proper sanitation by 82.6% (min-max 43.0%-96.4%; SD 14.5%). The prevalence of stunting in toddlers, in Indonesia by 22.4% (min-max 7.2%-37.9%; SD 6.0%). The stunting reduction rate is still below the national target set by the government, which is 14%.

TABLE. 2. Analysis of the Achievement of Preventive Health Efforts With the Prevalence of Stunting In Toddlers, Indonesia

Coverage	R	R^2	Line Equation	*P-value*
Complete Basic Immunizations (CCBI)	*0,344*	*0,119*	*Stunting=35,354-0,143*CCBI*	*0,046**
Supplementary feeding (CSFE)	*0,028*	*0,001*	*Stunting=24,207-0,020*CSFE*	*0,875*
Monitoring the growth of toddlers (CMGT)	*0,489*	*0,240*	*Stunting=41,910-0,255*CMGT*	*0,003**
Exclusive breastfeeding (CEXB)	*0,277*	*0,077*	*Stunting=27,839-0,095*CEXB*	*0,113*
Supplementary of Vitamin A (CSVA)	*0,321*	*0,103*	*Stunting=33,731-0,132*CSVA*	*0,064*
Implementation of GERMAS (CIOG)	*0,400*	*0,160*	*Stunting=28,108-0,076*CIOG*	*0,019**
ODF Villages (CODF)	*0,335*	*0,112*	*Stunting=28,523-0,090*CODF*	*0,053*
STBM Villages (CSTB)	*0,303*	*0,092*	*Stunting=36,660-0,158*CSTBM*	*0,082*
Livable Homes (CLHO)	*0,320*	*0,102*	*Stunting=31,853-0,151*CLHo*	*0,065*
Proper Sanitation (CPSA)	*0,434*	*0,188*	*Stunting=44,998-0,273*CPSA*	*0,010**

Sumber : Profil Kesehatan Indonesia, 2023

The results of the simple linear regression test showed that there was a linear relationship between coverage of preventive health efforts including complete basic immunization, monitoring the growth of child, implementation of GERMAS, and proper sanitation with the prevalence of stunting in toddlers, Indonesia (*p-value* ≤ 0.05). Meanwhile, the coverage of preventive health efforts includes: supplementary feeding, exclusive breastfeeding, supplementary vitamin A, ODF villages, STBM villages, and livable homes there is no linear relationship with the prevalence of stunting in toddlers, in Indonesia (*p-value* > 0.05).

The relationship between coverage of complete basic immunization and stunting in toddlers is moderate (r=0.344) and has a positive pattern, meaning that the prevalence of stunting in toddlers will decrease further with the increase in coverage of complete basic immunization. The determination coefficient value of 0.119 means that 11.9% of the prevalence of stunting in toddlers is related to complete basic immunization coverage, the remaining 88.1% is explained by other variables. The regression model equation is stunting=35.354-0.143*CCBI, meaning that the coverage of complete basic immunization increases, it is predicted to further reduce stunting in toddlers in Indonesia. The relationship between coverage of monitoring the growth of toddlers with stunting is moderate (r=0.489) and has a positive pattern, meaning that the prevalence of stunting in toddlers will decrease further with the increase of monitoring the growth of toddlers. The determination coefficient value of 0.240, meaning that 24.0% of the prevalence of stunting in toddlers is related to the coverage of monitoring the growth of toddlers, the remaining 76.0% is explained by other variables. The regression model equation is Stunting=41.910-0.255*CMGT, meaning that the coverage of monitoring the growth of toddlers increases, it is predicted to further reduce stunting in toddlers in Indonesia.

The relationship between coverage of GERMAS implementation and stunting is moderate (r=0.400) and has a positive pattern, meaning that the prevalence of stunting in toddlers will decrease further with the increase in coverage of GERMAS implementation. The determination coefficient value of 0.160 means that 16% of the prevalence of stunting in toddlers is related to the coverage of GERMAS implementation, the remaining 84% is explained by other variables. The regression model equation is stunting=28.108-0.076*CIOG, meaning that the coverage of GERMAS implementation increases, it is predicted to further reduce stunting in toddlers in Indonesia. The relationship between coverage of proper sanitation and stunting is moderate (r=0.434) and has a positive pattern, meaning that the prevalence of stunting in toddlers will decrease further with the increase in coverage of proper sanitation. The value of the determination coefficient is 0.188, meaning that 18.8% of the prevalence of stunting in toddlers is related to the coverage of proper sanitation, the remaining 81.2% is explained by other variables. The regression model equation is stunting=44.998-0.273*CPSA, meaning that the

coverage of proper sanitation increases, and it is predicted to further reduce stunting in toddlers in Indonesia.

TABLE 3. Modeling Analysis of Coverage of Preventive Health Efforts with the Prevalence of Stunting in Toddlers in Indonesia, 2023

Coverage	Line Equation	*P-value*	*CI 95%*
Tahap 1			
ODF Villages (CODF)	*Stunting=60,009-0,074*CODF*	*0,211*	*-0,192-0,045*
STBM Villages (CSTB)	*Stunting=60,009-0,031*CSTB*	*0,812*	*-0,294-0,233*
Implementation of GERMAS (CIOG)	*Stunting=60,009-0,055*CIOG*	*0,111*	*-0,123-0,013*
Livable Homes (CLHO)	*Stunting=60,009-0,027**CLHO*	*0,767*	*-0,214-0,160*
Complete Basic Immunizations (CCBI)	*Stunting=60,009-0,031*CCBI*	*0,704*	*-0.136-0,198*
Monitoring the growth of toddlers (CMGT)	*Stunting=60,009-0,213*CMGT*	*0,024*	*-0,395-0,031*
Exclusive breastfeeding (CEXB)	*Stunting=60,009-0,104*CEXB*	*0,318*	*-0,107-0,315*
Supplementary of Vitamin A (CSVA)	*Stunting=60,009-0,006*CSVA*	*0,962*	*-0,251-0,263*
Proper Sanitation (CPSA)	*Stunting=60,009-0,206*CPSA*	*0,160*	*-0,500-0,087*
Tahap 2			
ODF Villages (CODF)	*Stunting=55,556-0,038*CODF*	*0,366*	*-0,121-0,046*
Implementation of GERMAS	*Stunting=55,556-0,044*CIOG*	*0,131*	*-0,103-0,014*
Monitoring the growth of toddlers (CMGT)	*Stunting=55,556-0,184*CMGT*	*0,024*	*-0,342-0,027*
Proper Sanitation (CPSA)	*Stunting=55,556-0,160*CPSA*	*0,108*	*-0,356-0,037*
Tahap 3			
Implementation of GERMAS	*Stunting=55,511-0,050*CIOG*	*0,082*	*-0,107-0,007*
Monitoring the growth of toddlers (CMGT)	*Stunting=55,511-0,187*CMGT*	*0,021*	*-0,344-0,030*
Proper Sanitation (CPSA)	*Stunting=55,511-0,182*CPSA*	*0,059*	*-0,372-0,007*
Tahap 4			
Monitoring the growth of toddlers (CMGT)	*Stunting=55,837-0,211*CMGT*	*0,011*	*-0,371-0,052*
Proper Sanitation (CPSA)	*Stunting=55,837-0,209*CPSA*	*0,035*	*-0,402-0,015*

Preventive health efforts are organized to reduce the prevalence of stunting in toddlers through an approach focusing on prevention efforts. The study results show that some coverage of preventive health efforts is linearly related to the prevalence of stunting in toddlers. The coverage of preventive health efforts that are linearly related includes: complete basic immunization, monitoring the growth of child, implementation of GERMAS, and proper sanitation.

Complete basic immunization given to infants and children is a preventive health effort through the provision of immunity that can protect against the transmission of Diseases That Can Be Prevented by Immunization (PD3I). The high coverage of complete basic immunization in the region will form *herd immunity* which means that most of the population (70-90%) becomes immune to certain diseases. Toddlers who do not have a history of immunization mean that they do not have immunity and can be at risk of developing PD3I disease. Basic immunizations are not fully met, so toddlers are at risk of being infected with diseases that cause decreased appetite so the nutritional intake of toddlers is reduced. [19] Immunization plays a role as one of the factors to prevent stunting in children aged 1-5 years. [20] [21] [22] [23] Toddlers with incomplete and unimmunized immunizations have a higher risk of

[19] Tri Mulyaningsih et al., "Beyond Personal Factors: Multilevel Determinants of Childhood Stunting in Indonesia," *PLoS ONE* 16, no. 11 (2021): 1–19, https://doi.org/10.1371/journal.pone.0260265.

[20] Melvanda Gisela Putri, Roedi Irawan, and Indri Safitri Mukono, "The Relationship of Vitamin a Supplementation, Giving Immunization, and History of Infection Disease With the Stunting of Children Aged 24-59 Months in Puskesmas Mulyorejo, Surabaya," *Media Gizi Kesmas* 10, no. 1 (2021): 72–79, https://doi.org/10.20473/mgk.v10i1.2021.72-79.

[21] Gracia Natalia Theresia and Verawati Sudarma, "Immunization Status Lowers the Incidence of Stunting in Children 1-5 Years," *World Nutrition Journal* 6, no. 1 (2022): 9–15, https://doi.org/10.25220/wnj.v06.i1.0003.

[22] Francis Danso and Maxwell Afranie Appiah, "Prevalence and Associated Factors Influencing Stunting and Wasting among Children of Ages 1 to 5 Years in Nkwanta South Municipality, Ghana," *Nutrition* 110 (2023): 1–9, https://doi.org/10.1016/j.nut.2023.111996.

[23] Omid Dadras et al., "Prevalence of Stunting and Its Correlates among Children under 5 in Afghanistan : The Potential Impact of Basic and Full Vaccination," *BMC Pediatric* 24, no. 1 (2024): 1–10, https://doi.org/DOI: 10.1186/s12887-024-04913-w.

stunting than toddlers who receive complete immunizations. [24] [25] [26]

Monitoring the growth of children is a preventive health effort through weighing activities, filling out KMS, assessing growth, and following up on every case of disorders. The high coverage of monitoring the growth of child has an impact on improving the quality of health and ensuring that toddlers grow healthy and productive in the future. Monitoring of growth and development is carried out at the Posyandu. The results of the study showed that growth and development monitoring contributed to the prevalence of underweight and stunting among children under five years old.[27] The prevalence of stunting is higher among children who do not regularly go to Posyandu. [28] [29] Monitoring the growth of child is very important to find out the presence of growth disorders from an early age, through weight weighing is the best way to assess the nutritional status of toddlers every month so that the growth of toddlers will be monitored. [30]

GERMAS is a preventive health effort through a movement to promote a healthy living culture and abandon unhealthy habits and behaviors in the community by promoting clean and healthy living behaviors through the support of community-based infrastructure programs. The high coverage of GERMAS has great potential to reduce the prevalence of stunting in an area. Through efforts to improve diet, sanitation, community empowerment, and health services, GERMAS contributes to the prevention of stunting from an early age and supports healthy child growth and development. Implementing a healthy lifestyle through GERMAS can contribute to supporting stunting prevention. [31] [32] Community empowerment, especially for women, is an intervention strategy that has a positive

[24] Arindah Nur Sartika et al., "Prenatal and Postnatal Determinants of Stunting at Age 0 – 11 Months : A Cross- Sectional Study in Indonesia," *PLoS ONE* 19, no. 12 (2021): 1–14, https://doi.org/10.1371/journal.pone.0254662.

[25] Sara M Hendrickson et al., "Campylobacter Vaccination Reduces Diarrheal Disease and Infant Growth Stunting among Rhesus Macaques," *Nature Communications* 14, no. 1 (2023): 16, https://doi.org/10.1038/s41467-023-39433-1.

[26] Eka Desi Purwanti, Siti Masitoh, and Sudarto Ronoatmojo, "Association Between Basic Immunization Status and Stunting in Toddlers Aged 12 to 59 Months in Indonesia," *Journal Preventive Medicine and Public Health*, 2025, 1–15, http://dx.doi.org/10.1016/j.enbuild.2014.11.059.

[27] 23

[28] Paulus D Sahanggamu et al., "Information Exposure and Growth Monitoring Favour Child Nutrition in Rural Indonesia," *Asia Pacific Journal Clinic Nutrition* 26, no. 2 (2017): 313–16, https://doi.org/10.6133/apjcn.012016.09.

[29] Resti Rahmadika Akbar, Windy Kartika, and Mutiara Khairunnisa, "The Effect of Stunting on Child Growth and Development," *Scientific Journal* 3, no. 4 (2023): 153–60, https://doi.org/http://journal.scientic.id/index.php/sciena/issue/view/11.

[30] Hijrawati et al., "Use of Technology for Monitoring the Development of Nutritional Status 1000 Hpk in Stunting Prevention in Indonesia," *Gaceta Sanitaria* 35, no. 52 (2021): S231–34, https://doi.org/10.1016/j.gaceta.2021.10.028.

[31] Fitria Hayu Palupi, Siskana Dewi Rosita, and Gipfel Remedina, "Optimalisasi GERMAS Dalam Pencegahan Stunting Di Desa Rejosari Kecamatan Polokarto Kabupaten Sukoharjo," *Abdi Geomedisains* 1, no. 2 (2021): 79–86, https://doi.org/10.23917/abdigeomedisains.v1i2.203.

[32] Endang Sri Wahyuni and Roh Hastuti Prasetyaningsih, "Optimization Of The Role Of Cadres In Germas Management," *Jurnal Empathy Pengabdian Kepada Masyarakat* 3, no. 2 (2022): 110–21, https://jurnalempathy.com/index.php/jurnalempathy/article/view/150/57.

impact on the prevention and reduction of stunting. [33] [34] [35]

Proper sanitation is a preventive health effort through the provision of clean water, disposal of feces, garbage, and waste, and environmental cleanliness. With increasing the coverage of proper sanitation, the risk of diseases that can interfere with the growth and development of toddlers is reduced, so that it can support optimal physical growth, good nutritional absorption, and healthy brain development of toddlers. The results of the study show that WASH (*Water, Sanitation, and hygiene*) contributes to stunting in toddlers in developing countries. [36] [37] [38] [39] Increased coverage of basic sanitation and WASH contributes to reducing stunting.[40] [41] WASH interventions aim to address malnutrition focusing on reducing the incidence of diarrhea and worms in children living in poor sanitation conditions.[42] [43] Observational studies show that diarrhea and worm infections due to poor sanitation are associated with a risk of stunted growth that impacts stunting. [44] [45] [46]

The results of multiple regression analysis showed that the coverage of monitoring the growth of child and proper sanitation significantly predict the prevalence of stunting in toddlers, in Indonesia. With the increasing coverage of efforts to monitor the growth of child and proper sanitation, it is predicted to further reduce the prevalence of stunting in toddlers, in Indonesia. Increasing the coverage of monitoring the growth of child can be done through efforts to increase access and availability of health efforts, health education and counseling to parents and the community,

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[33] Evi Soviyati et al., "Effect of Applying the Health Promotion Model in Stunting Prevention and Behavior Control in Indonesia" 12, no. January (2018): 1–6, https://doi.org/10.4103/jehp.jehp.

[34] Karah Mechlowitz et al., "Women's Empowerment and Child Nutrition in a Context of Shifting Livelihoods in Eastern Oromia, Ethiopia," *Frontiers in Nutrition* 10 (2023): 1–11, https://doi.org/10.3389/fnut.2023.1048532.

[35] Emebet Gashaw Wassie, Mesfin Wogayehu Tenagashaw, and Tenaw Yimer Tiruye, "Women Empowerment and Childhood Stunting: Evidence from Rural Northwest Ethiopia," *BMC Pediatrics* 24, no. 1 (2024): 1–8, https://doi.org/10.1186/s12887-023-04500-5.

[36] Batool et al., "Relationship of Stunting with Water, Sanitation, and Hygiene (WASH) Practices among Children under the Age of Five: A Cross-Sectional Study in Southern Punjab, Pakistan."

[37] Mulyaningsih et al., "Beyond Personal Factors: Multilevel Determinants of Childhood Stunting in Indonesia."

[38] Corina Shika Kwami et al., "Water , Sanitation , and Hygiene : Linkages with Stunting in Rural Ethiopia," *International Journal of Environmental Research and Public Health* 16, no. 20 (2019): 1–21, https://doi.org/doi:10.3390/ijerph16203793.

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strengthening health information systems (integrated recording and technology empowerment in growth and development monitoring), increasing focus on vulnerable groups, strengthening funding and resources, and periodic monitoring and evaluation. Meanwhile, increasing the coverage of proper sanitation can be done through efforts to improve sanitation infrastructure, community education, and counseling, improving the quality and utilization of technology in sanitation management. For success in increasing the coverage of monitoring the growth of child and proper sanitation, an integrative approach is needed that involves the active participation of the government, the community, health workers, and other sectors. WASH strategies, especially sanitation in intervention formulations that are integrated with health promotion for early childhood development monitoring, can be carried out to reduce stunting in toddlers in developing countries. [47]

CONCLUSION

The coverage of monitoring the growth of child and proper sanitation significantly predicts the prevalence of stunting in toddlers in Indonesia. With the increasing coverage of monitoring the growth of child and proper sanitation, it is predicted that it will further reduce the prevalence of stunting in toddlers in Indonesia. It is necessary to increase the coverage of monitoring the growth of child and proper sanitation in an integrated manner to reduce stunting in toddlers in Indonesia.

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There are no conflicts of interest.

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