

Analysis of Determinan of Stunting Prevalence among Stunted Toddlers in Indonesia

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Abstract

Stunting is regarded as one of the nutritional problems in Indonesia. The prevalence of stunted toddlers in Indonesia showed a decline from 37.2 percent in 2013 to 30.8 percent in 2018. However, this was still far from the WHO target, which should be less than 20 percent. There were two objectives of this study, firstly, to determine the general condition of health and nutrition of toddlers as well as the general condition of households in Indonesia. The second one was to examine the determinants of stunting in toddlers. The data were obtained from Riskesdas 2018, Podes 2018, and population projections per district/city from Statistics Indonesia. The method was carried out using descriptive and inferential analysis. The findings showed that all regions in Indonesia, excluding DKI Jakarta, experienced cases of stunted toddlers categorized in high and very high categories. The regression results confirmed that the prevalence of malnutrition toddlers, the prevalence of obese toddlers, complete basic immunization coverage, the prevalence of chronic energy deficiency in women of childbearing age, the proportion of villages that had adequate midwives per population, as well as the coverage of access and clean water sources had a significant effect on the prevalence of stunted toddlers in Indonesia. The case of stunted toddlers was mainly caused by poverty, bad lifestyle, inadequate health services, and low access to clean water. Therefore, the government policies are then needed, especially those related to socio-economic determinants.

Keywords: stunting; toddler; health; malnutrition

Introduction

Stunting is one of the nutritional problems. Stunting is a chronic nutritional problem in toddlers (children under five) which is characterized by a shorter height compared to children of their age (Pusdatin Kemenkes RI, 2018). Toddlers who suffer from stunting may experience stunted growth and will not reach their maximum height. In addition to having an impact on health in the form

of physical damage, stunting also affects children's intelligence. Their brains do not develop to their full cognitive potential and thus suffer irreversible severe cognitive impairment. They start their lives in less favorable conditions, such as facing learning difficulties in school, earning lower incomes as adults, and facing barriers to participation in society (UNICEF et al., 2019). The ill effects of stunting can last a lifetime, even affecting the next generation. Stunted

toddlers will be more susceptible to disease and are at risk of developing degenerative diseases as adults.

Overall, the stunting cases showed a declining trend. According to the publication of UNICEF et al. (2019), stunting occurred at around 21.9 percent or 149 million toddlers in the world in 2018 and in 18 years it had decreased from the year 2000 which was around 32.5 percent or around 198,2 million stunted toddlers. Thus, there were about 1 in 4 toddlers in the world who experience stunting. From 2018, more than half of the world's stunted toddlers were from Asia (55 percent) and more than a third were from Africa (39 percent). Then, 25 percent or 14.4 million toddlers in Southeast Asia suffered from stunting in 2018 and this was much better in 2000, i.e., 38.4 percent (21 million) stunted toddlers (UNICEF et al., 2019).

In 2018, the number of stunted toddlers in Asia had decreased from around 134.7 million stunted toddlers in 2000 to 81.7 million toddlers. Based on a report from UNICEF (2019), in 2018 1 in 3 toddlers globally did not grow well and almost 1 in 5 toddlers in East Asia-Pacific also grew poorly. Not growing well here includes cases of stunting, wasting, and overweight. A total of 13 million (8.4 percent) stunted toddlers occurred in East Asia-Pacific in 2018 from 24.5 percent in 2000. In the East Asia-Pacific region, Indonesia ranked second in the prevalence of toddlers who did not grow well in 2018, which was around 59 percent, after Papua New Guinea which had the highest prevalence, which was 65 percent (UNICEF, 2019).

Table 1. Stunting Prevalence Threshold and Labels

Labels	Prevalence Thresholds (%)
Very low	< 2.5
Low	2.5 - < 10
Medium	10 - < 20
High	20 - < 30
Very high	≥ 30

Source: WHO-UNICEF, 2018 (in de Onis et al., 2018)

The latest stunting prevalence threshold (Table 1) was set by the World Health Organization-United Nations Children's Fund (WHO-UNICEF) and released in 2018 which is useful for categorizing stunting prevalence so that it can see the urgency of stunting in each country in the world (de Onis et al., 2018). The prevalences of malnourished/severe malnourished and wasted/severe wasted toddlers in Indonesia tend to decrease in 2018 compared to the conditions in 2013. Meanwhile, the prevalence of stunted toddlers decreased from 37.2 percent in 2013 to 30.8 percent in 2018. The prevalence of stunting children under 2 also decreased

from 32.8 percent in 2013 to 29.9 percent in 2018 (Balitbangkes, 2019b). Based on the thresholds in Table 1, although both prevalence rates had decreased, still the prevalence of stunted toddlers in Indonesia was very high and the prevalence of stunting children under 2 was high. This is still a big challenge for Indonesia in reducing stunting cases because the prevalence of stunted toddlers in Indonesia is still far from the WHO target, which must be less than 20 percent.

Stunting is an important thing to pay attention to because it concerns the quality of Indonesia's human resources in the future because children are the nation's assets. In

the SDGs, stunting is explicitly included in the third agenda, namely “Good Health and Well Being”. However, if this is examined more deeply, stunting is also included in the agenda of the second “Zero Hunger” and sixth “Clean Water & Sanitation”. By 2030, it is hoped that all countries will end all forms of malnutrition, including stunting in toddlers.

The government had taken various actions in handling stunting in Indonesia. Indonesia joined the Global Scaling Up Nutrition (SUN) Movement in 2011. The government had also drafted several regulations, one of which was the Presidential Regulation of the Republic of Indonesia Number 83 of 2017 concerning Strategic Food and Nutrition Policy. Stunting prevention was also included in the National Medium Term Development Plan (RPJMN) 2015-2019. The government had also launched an integrated stunting prevention intervention program that involved across ministries and agencies. A total of 23 ministries/agencies had collaborated to accelerate stunting prevention. At the end of 2018, The National Team for the Acceleration of Poverty Reduction (TNP2K) had compiled the National Strategy (Stranas) for the Acceleration of Stunting Prevention 2018-2024. The policy framework related to Stranas Stunting was prepared based on Law No. 36/2009 on Health and Law No. 18/2012 on Food. This cross-sectoral collaboration was expected to reduce the stunting rate in Indonesia so that the target of the Sustainable Development Goals (SDGs) in 2030, namely the stunting rate, decreases to 40 percent.

Thus, efforts to prevent and reduce stunting rates cannot be carried out only by the health sector, but by involving cross-sectors and of course from within the family itself. Many countries in the world are still far from being without malnutrition, including Indonesia. Improving children’s nutrition requires an effective and sustainable multi-sectoral nutrition policy in the long term because the main goal is to make all children

free from all forms of malnutrition. Regular data collection is essential for monitoring and analyzing country progress. Therefore, research related to the determinants of stunting in toddlers in Indonesia is important to do, so that government policies in ending stunting can be implemented in a comprehensive, coordinated, and involve all related sectors.

Literature Review

Stunting indicates the condition of the patient is in a state of poor health. The classical theory of H. L. Blum stated that there are four factors that affect health status (Blum, 1981), namely a clean and healthy lifestyle, the environment (social, economic, political, and cultural) especially related to sanitation and access to clean water, health services especially basic health such as the availability of village midwives and basic immunization services, and genetic (hereditary) factors, especially good nutrition during the first 1000 days of a child’s life.

Mosley and Chen in 1984 suggested five categories of intermediate variables related to socio-economic determinants that affect children’s health levels, namely maternal factors including age, parity, and birth spacing; environmental pollution factors related to disease transmission to children and mothers through contact with air, food, water, fingers, skin, soil, inanimate objects, and insects; malnutrition factor in children as well as pregnant and lactating women; accidental or unintentional injury factors include physical injuries, burns, and poisoning; and individual disease control factors include traditional and modern preventive measures as well as medical care (Bappenas, 2009).

Filmer (2003) also explained the socio-economic factors as the cause of infant mortality (Bappenas, 2009). He stated that the infant mortality rate and the nutrition provided were influenced by the demand side (sanitation, disease prevention measures in

the family, income, education, and parental knowledge) and supply (government policies at the micro and macro levels as well as the implementation of the policy, the capability of the local government, and infrastructure and access and quality of health services). Health services here are very important in influencing health outcomes, namely child mortality and child nutrition levels.

According to TNP2K (2017), several factors causing stunting are (1) poor parenting practices, including the lack of maternal knowledge about health and nutrition before and during pregnancy, as well as after the mother gives birth; (2) limited health services, including ANC-Ante Natal Care (health services for mothers during pregnancy), Postnatal care, and quality early learning; (3) the lack of access to nutritious food among family members; and (4) lack of access to clean water and sanitation.

Stunted toddlers-are included in chronic nutritional problems caused by various factors, such as socioeconomic conditions, maternal nutrition during pregnancy, morbidity in infants, and lack of nutritional intake in infants (Pusdatin Kemenkes RI, 2018). The National Strategy for the Acceleration of Stunting Prevention 2018-2024 emphasizes that nutritional intake for under-two children and toddlers, nutrition for pregnant and lactating mothers, immunization, sanitation and clean water including drinking water, and health services are interventions that can be done to prevent stunting (TNP2K, 2018).

According to UNICEF et al. (2019), malnutrition such as stunting, for example, can be prevented through various means, such as adequate maternal nutrition before and during pregnancy and during breastfeeding; optimally breastfeeding in the first two years of life; nutritious, varied, and safe food for early childhood; and a healthy environment, including access to basic health, water, hygiene and sanitation services, and opportunities for safe physical activity.

In several other studies on stunting, it was found that stunting in childhood was also associated with fat oxidation disorders, where children who were malnourished or stunted had fat oxidation disorders compared to those without stunting in the same environment. These findings may help explain the increasing prevalence of overweight and obesity among stunted adults and adolescents in developing countries (Hoffman et al., 2000). In the long term, stunting children who manage to survive in adulthood tend to become obese and have the opportunity to suffer from non-communicable diseases, such as hypertension, diabetes, cancer, and others (Atmarita, 2018).

Nasrul et al. (2015) concluded that the dominant risk factors for stunting in children aged 6-23 months were low birth weight, children aged 12-23 months, mother's height was less than 150 cm, caregivers did not wash their hands with soap, and incomplete basic immunizations. The results of Ni'mah and Nadhiroh's research (2015) stated that there was a relationship between birth length of toddlers, history of exclusive breastfeeding, family income, mother's education, and maternal's nutrition knowledge on the incidence of stunting in toddlers. Then Beal et al. (2018) found consistent evidence showing that non-exclusive breastfeeding for the first 6 months, low household socioeconomic status, premature birth, short birth length, low maternal height, and education were important factors that cause child stunting in Indonesia. Children from households with unrepaired latrines and untreated drinking water are at higher risk. Community factors, particularly poor access to health care and living in rural areas, have been repeatedly linked to stunting.

Methods

This study used a quantitative approach using secondary data. The data were obtained from

Basic Health Research (Riskesdas) 2018, Village Potential Survey (Podes) 2018, and population projections per district/city from the Statistics Indonesia (BPS). The unit of analysis was household level having stunted children under five (toddlers). Prevalence of toddlers was then analyzed by provinces. The method of analysis used descriptive analysis and multiple linear regression.

Based on the background of the problem, the dependent variable was the prevalence of stunting under five (toddlers) in Indonesia in 2018. From the description of the previous literature review, various factors

were suspected to be the determinants of the prevalence of stunted toddlers which then became the independent variables in this research. About six variables were hypothesized affecting to stunted toddlers, including the prevalence of malnourished and severe malnourished toddlers, prevalence of overweight toddlers, complete basic immunization coverage, prevalence of Chronic Energy Deficiency (CED) in Women of Childbearing Age (WCA), the proportion of villages that have sufficient midwives per population, and coverage of access and clean water sources (Table 2).

Table 2. Description of Research Variables

Variabels	Operational Definition	Data Source	Value/Category
Dependent Variable			
Prevalence of stunted toddlers	The proportion of children aged 0-59 months who are stunting and severe stunting by comparing height and age. Its criteria if they have a Z-Score value less than -2 HAZ (Height for Age Z-Score)	Riskesdas 2018	0 – 100 percent
Independent Variables			
Prevalence of malnourished and severe malnourished toddlers	The proportion of children aged 0-59 months who are malnourished and severe malnourished by comparing weight and age. Its criteria if they have a Z-Score value less than -2 HAZ (Height for Age Z-Score)	Riskesdas 2018	0 – 100 percent
Prevalence of overweight toddlers	The proportion of children aged 0-59 months who are overweight by comparing weight and height. Its criteria if they have a Z-Score value more than 2 HAZ (Height for Age Z-Score)	Riskesdas 2018	0 – 100 percent
Complete basic immunization coverage	The proportion of toddlers who received immunization. Complete criteria if the toddler has been immunized 1 time BCG, 3 times DPT-HB/DPT-HB-HiB, 4 times Polio or 3 times IPV, and 1 time Measles	Riskesdas 2018	0 – 100 percent
Prevalence of CED in WCA	The proportion of women of childbearing age (WCA) 15-49 years (pregnant and non-pregnant) measured upper arm circumference at the time of the survey. Criteria for Chronic Energy Deficiency (CED) if the upper arm circumference shows less than 23.5 cm	Riskesdas 2018	0 – 100 percent
Proportion of villages with sufficient midwives per population	The proportion of number of villages in a district/city that has sufficient number of midwives per village population. The sufficient ratio if in a village there is at least 1 midwife per 1,000 population	Podes 2018 and population projections per district/city 2018	0 – 100 percent

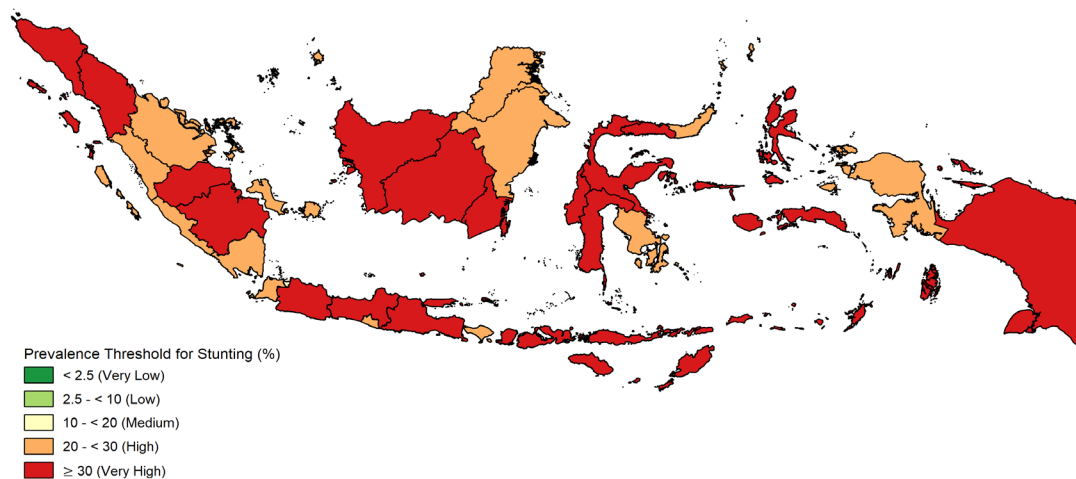
Coverage of access and clean water sources	The proportion of households with access to clean water is measured according the use of clean water per capita in the household. Good access to clean water if the household uses at least 20 liters per person per day and the water source comes from bottled water, refilled water, tap water/PDAM, retail/purchased tap water, drilled wells/pumps, protected dug wells, or springs protected	Riskesdas 2018	0 – 100 percent
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Result and Discussion

Health and Nutritional Condition of Indonesian Toddlers

The incidence of stunted toddlers (stunting and severe stunting) is a major nutritional problem faced by Indonesia. Indonesia is one of the countries with a very high prevalence of stunting ($\geq 30\%$) according to the prevalence threshold set by WHO-UNICEF. Based on Riskesdas data for 2007-2018, the average prevalence of stunted toddlers in Indonesia was 35.1 percent. The prevalence of stunted toddlers decreased from 2007 (36.8 percent) to 30.8 percent in 2018. The prevalence of stunted toddlers used to 37.2 percent in 2013.

All regions in Indonesia experienced cases of stunted toddlers with high and very high categories, except DKI Jakarta Province which had a prevalence of stunted toddlers in the medium category, which was 17.7 percent (Figure 1). DKI Jakarta as the center of the nation's capital had an economic growth rate in 2018 of 6.17 percent (BPS, 2019) and was the largest contributor to the national economy (National GDP) at 17.31 percent (BPS). DKI Jakarta has the privilege of being the center of government, business, entertainment, education, and being the center of progress indicators for other provinces.



Source: Riskesdas 2018 – Balitbangkes (2019a), processed data

Figure 1. The Distribution of Prevalence of Stunted Toddlers in Indonesia, 2018

The prevalence of stunted toddlers in all provinces in 2018 experienced a decline, but East Kalimantan which had a slight increase compared to that in 2013. The provinces with the highest prevalence of stunted toddlers aged 0-59 months in 2018 were East Nusa Tenggara and West Sulawesi, i.e., 42.6 and 41.6 percent respectively, while the provinces with the lowest prevalence were DKI Jakarta (17.7 percent) and DI Yogyakarta (21.4 percent) (Balitbangkes, 2019a, 2019b).

The prevalence of malnourished and severely malnourished toddlers also decreased in 2018 compared to that of in 2013, from 19.6 percent to 17.7 percent. Nevertheless, there were still half of the toddlers and pregnant women in 2018 had not received the Supplementary Food Program (PMT), which was around 59 and 74.8 percent (Balitbangkes, 2019a, 2019b). The province with the highest prevalence of malnourished and severely malnourished toddlers aged 0-59 months in 2018 was East Nusa Tenggara, which was 29.5 percent, while the province with the lowest prevalence was Riau Islands, which was 13 percent (Balitbangkes, 2019a, 2019b).

Nationally, the prevalence of overweight toddlers in 2018 was low, reaching only 8 percent and this figure decreased from 2013 which was 11.8 percent (Balitbangkes, 2019a, 2019b). The province of West Nusa Tenggara had the lowest prevalence of overweight toddlers, which only reached 3.3 percent, while Papua became the province that achieved the highest prevalence of overweight toddlers in Indonesia in 2018, which was 13.2 percent. Overall, the prevalence of overweight toddlers in 2018 decreased in all provinces of Indonesia, except for the provinces of South Sulawesi, West Papua, and Riau Islands, which experienced a slight increase in the number of overweight toddlers.

The proportion of complete basic immunizations for children aged 12 – 23 months decreased from 59.2 percent in 2013

to 57.9 percent in 2018, while the proportion of children who were not immunized increased from 8.7 percent in 2013 to 9.2 percent in 2018 (Balitbangkes, 2019a, 2019b). The province of Bali managed to achieve the highest complete basic immunization coverage in Indonesia in 2018, which was 80.8 percent. Meanwhile, Aceh province had the lowest achievement related to complete basic immunization, which was only 19.6 percent.

General Conditions of Households in Indonesia

The proportion of women of childbearing age who experienced chronic energy deficiency (CED) in Indonesia reached 17.3 percent for pregnant women and 14.5 percent for non-pregnant women (Balitbangkes, 2019a, 2019b). The province with the highest proportion of women of childbearing age experiencing CED was East Nusa Tenggara with a proportion of 36.8 percent for pregnant women and 32.5 percent for non-pregnant women. Meanwhile, North Kalimantan province had the lowest proportion of women of childbearing age experiencing CED, which was 1.7 percent for pregnant women and 14.4 percent for non-pregnant women.

From Podes 2018 data, information was obtained regarding the proportion of villages that had sufficient midwives per population. The ratio of the number of midwives is said to be sufficient if a village has at least one midwife per 1,000 people. The condition of the adequacy of the midwife is the same as the condition of the adequacy of the doctor. However, there were still many areas in Indonesia that did not meet the adequacy of doctors and midwives. Only a few provinces had slightly better proportions for the adequacy of midwives. The lowest proportion for areas with sufficient midwives occurred in D.I. Yogyakarta, followed by DKI Jakarta, West Java, Banten, and East Java.

The proportion of households with access to clean water is measured based on the use of clean water per capita in the household. Access to clean water is said to be good if the household uses at least 20 liters per person per day and the water source comes from bottled water, refilled water, tap water/PDAM, retail/purchase tap water, drilled well/pump, protected dug well, or protected spring. There were still many areas in Indonesia where the proportion of households using less than 20 liters per person per day, such as in Papua, East Nusa Tenggara, West Kalimantan, West Papua, and North Sulawesi (Balitbangkes, 2019a, 2019b).

Determinants of the Prevalence of Stunted Toddlers in Indonesia

Multiple linear regression analysis was conducted to examine the determinants of the prevalence of stunted toddlers in Indonesia in 2018. In the first stage of the multiple linear regression analysis, five classical

assumption tests were performed, namely normality, autocorrelation, multicollinearity, heteroscedasticity, and linearity tests. The results showed that the classical assumptions in the data in this study were met. Therefore, it could be concluded that the multiple linear regression model in this study was good because it had met the BLUE (Best Linear Unbiased Estimator) criteria.

Based on the results of the regression analysis, the independent variables consisted of the prevalence of malnourished and severe malnourished toddlers, the prevalence of overweight toddlers, complete basic immunization coverage, the prevalence of CED in WCA, the proportion of villages that have sufficient midwives per population, and the coverage of access and clean water sources had a significance value of less than $\alpha = 0.05$ (Table 3). So, it could be concluded that all of these independent variables had a significant effect on the prevalence of stunted toddlers in Indonesia, with testing at a confidence level of 95 percent ($\alpha = 5$ percent).

Table 3. Results of Multiple Linear Regression Analysis

Variables	B	SE	t	Sig.
Constant	25.931	2.517	10.303	0.000
Prevalence of malnourished and severe malnourished toddlers	0.115	0.048	2.421	0.016
Prevalence of overweight toddlers	0.302	0.070	4.307	0.000
Complete basic immunization coverage	-0.138	0.018	-7.533	0.000
Prevalence of CED in WCA	0.232	0.056	4.172	0.000
Proportion of villages with sufficient midwives per population	0.173	0.015	11.697	0.000
Coverage of access and clean water sources	-0.080	0.019	-4.100	0.000

Source: Secondary data processing

Prevalence of Malnourished, Severely Malnourished, and Overweight Toddlers

The prevalence of malnourished and severely malnourished toddlers was directly proportional to the prevalence of stunted toddlers. If the prevalence of malnourished and severely malnourished toddlers increased by 1 percent, it would lead to a tendency to increase the prevalence of stunting by 11 percent. Likewise with the prevalence of overweight toddlers. If the prevalence of overweight toddlers increased by 1 percent, then the prevalence of stunted toddlers increased by 30 percent. Both conditions inhibit the absorption of nutrients by the body so that the growth of toddlers is disrupted and can cause toddlers to become stunted. This result was in line with the study by TNP2K (2017), Pusdatin Kemenkes RI (2018), UNICEF et al. (2019), and Ni'mah and Nadhiroh (2015), that poor parenting patterns (lack of nutrition and not nutritious) and limited household access to nutritious, varied, and safe food for early childhood, could cause toddlers to become stunted.

The condition of malnourished and severely malnourished toddlers can occur due to limited household access to nutritious food or due to poor parenting practices, namely, the mother lacks knowledge about health and nutrition. In addition, the distribution of welfare that has not been balanced is allegedly causing Indonesia to experience two cases of children at once, namely a lack of food intake and excess food consumption. This disparity in the distribution of welfare causes people in the low quintile to be unable to afford nutritious food, while on the other hand there are people in the upper middle quintile who consume excessive amounts of food. Excessive food consumption can increase the risk of overweight (obesity).

High income does not always increase the consumption of nutrients needed by the body, but an increase in income will increase the opportunity to choose food ingredients and

increase the consumption of preferred foods even though these foods are not nutritious. There are families with high incomes who are not good at managing family spending. They buy food with poor nutritional quality, which affects the nutritional condition of children.

Overweight or obesity can increase the risk of diseases, including heart disease, stroke, diabetes, and hypertension. In addition, obesity can also increase the risk of depression and can make children to have problems with their behavior and learning patterns. Obesity in toddlers can occur due to parenting errors, such as children consuming junk food and fast food. Such parenting pattern is also influenced by instant food advertisements on television.

Stunting in childhood is also associated with impaired fat oxidation. Malnourished or stunted children have impaired fat oxidation compared to those without stunting in the same environment. These findings may help explain the increasing prevalence of overweight and obesity among stunted adults and adolescents in developing countries (Hoffman et al., 2000).

Complete Basic Immunization Coverage

Complete basic immunization coverage was inversely proportional to the prevalence of stunted toddlers. If the complete basic immunization coverage increased by 1 percent, it would lead to a tendency to decrease the prevalence of stunting under five by 13.8 percent. Toddlers who received complete basic immunizations tend to have stronger body resistance than toddlers who received incomplete immunizations or who did not receive immunizations at all.

Still, there is a gap in complete basic immunization coverage among provinces in Indonesia. Complex factors lead to doubts about the immunization program, including political factors, history, relationships with health workers, and emotional factors. WHO describes doubts about vaccines

(immunization) occur when someone delays or refuses to get available immunization services. This condition is complex and specific, varies greatly over time, and places as well as a different type of vaccines. The level of public trust in the government and vaccine safety are very important factors. Low public trust can cause people to be reluctant and reject the immunization program. Whereas children who are not given complete basic immunizations can be at risk of suffering from infectious diseases.

One of the infectious diseases is diarrhea and respiratory tract infections (RTIs). Increasing the duration of diarrhea and RTIs can affect the decrease in the nutritional status of a toddler. An increase in the duration of diarrhea is associated with a decrease in the height-of-age index. An increase in the duration of diarrhea, fever, and RTIs is also associated with other nutritional parameters, namely a decrease in the weight-of-age index. Growth retardation caused by diarrhea is related to impaired nutrient absorption during and after diarrhea. Growth retardation caused by RTIs is associated with increased metabolic demands and impaired food absorption during the period of illness.

The results of this study were in line with Nasrul et al. (2015) which stated that basic immunization coverage is one of the dominant risk factors for stunting. TNP2K (2018) also added in the National Strategy (Stranas) for the Acceleration of Stunting Prevention 2018-2024 that one of the interventions that can be done to prevent stunting is to increase immunization coverage.

Prevalence of Chronic Energy Deficiency (CED) in Women of Childbearing Age (WCA)

The prevalence of CED in WCA was directly proportional to the prevalence of stunted toddlers. If the prevalence of CED in WCA increased by 1 percent, it would lead to a tendency to increase the prevalence of stunted toddlers by 23.2 percent. This result

is in line with the study by the Indonesian Ministry of Health's Pusdatin (2018) and UNICEF et al. (2019) that stunting toddler was included in the problem of malnutrition, one of which was caused by insufficient maternal nutrition before and during pregnancy and during breastfeeding. In the National Strategy for Accelerating Stunting Prevention 2018-2024, it was also emphasized that nutrition for pregnant and lactating women is an intervention that can be done to prevent stunting.

CED in WCA can occur because of the low economic level so that they are limited in accessing nutritious and nutrient-rich food. In addition, it can also occur because the mother's knowledge about health and nutrition is still low, so the food they consume is still low in nutrients which can cause WCA to suffer from CED.

The only nutritional intake for the fetus is from the mother through the placenta, so the food intake consumed by pregnant women will greatly affect the growth and development of the fetus they contain. Lack of intake of blood-boosting supplements or vitamins also has the potential to cause CED in pregnant and lactating women so that it will have an impact on the health of the fetus they contain or the baby they are breast-feeding. The condition of the fetus with a mother who has CED will experience nutritional deficiencies and growth that is not optimal, including growth in height and weight. In fact, the possibility of the fetus being born in LBW (low birth weight) conditions is even greater and this LBW condition is one of the risk factors for stunting.

On the other hand, breastfeeding women who experience CED can inhibit the production of breast milk, which is the main nutrition for infants aged 0-6 months to 2 years old. The success of exclusive breastfeeding for infants aged 0-6 months is very dependent on the health and psychological conditions of the mother and the support of the surrounding environment.

Mothers whose nutritional and psychological needs are met so as to avoid CEDs will be able to produce quality and abundant breast milk so that breastfeeding for children up to two years of age can be achieved.

Proportion of Villages with Sufficient Number of Midwives per Population

A rather strange result was seen in the proportion of villages that have a sufficient number of midwives per population, which was directly proportional to the prevalence of stunted toddlers. If the adequacy of midwives per population increased by 1 percent, it would lead to a tendency to increase the prevalence of stunted toddlers by 17.3 percent. This strange result was suspected since the number of midwives who live permanently in the village might live in places that were hard to reach by people, especially in areas with difficult transportation access. For this reason, even though the area had a sufficient number of midwives per population, if the geographical area was difficult to reach the existence of a midwife, the presence or absence of a midwife would not greatly affect the health status of the people in that area. Therefore, it is necessary for the government in addition to trying to meet the needs of the number of midwives in each village, but also trying to improve transportation access, especially those connecting with access to health services, such as doctor's practices, poskesdes, puskesmas, and hospitals.

Coverage of Access and Clean Water Source

The coverage of access and clean water sources was inversely proportional to the prevalence of stunted toddlers. If the coverage of access and clean water sources increased by 1 percent, it would lead to a tendency to decrease the prevalence of stunted toddlers by 8 percent. This result was in line with TNP2K (2017) and UNICEF et al. (2019) that an unhealthy environment including

lack of access to clean water sources was one of the factors causing stunting. The National Strategy for Accelerating Stunting Prevention 2018-2024 also emphasized that access to clean water is an intervention that can be done to prevent stunting.

Factors causing stunting are not only nutritional intake or infectious diseases, but also because of household access to clean water sources. There were still gaps in access and clean water sources for households between provinces in Indonesia, causing the stunting rate between provinces to also vary. If sanitation and clean water sources are not available, toddlers will be vulnerable to disease, especially for newborns, it will be able to interfere with the first 1,000 days of life because they are not able to absorb nutrition properly, which can put the toddler at risk of stunting.

In general, the overall results of this study were in line with Mosley and Chen in 1984 (Bappenas, 2009) who explained that the health status of a child was influenced by maternal and prospective mother factors (CED in WCA) and the environment (access and clean water sources). H.L. Blum's theory also further strengthened the results of this study that in addition to environmental factors, health services (complete basic immunizations and villages that have a sufficient number of midwives per population) and lifestyle (at risk of causing malnourished, severely malnourished, and overweight toddlers) affect health status (Blum et al., 1981).

The results of this study were also in line with the findings of Frongillo et al. (1997) that child malnutrition in the household was strongly influenced by the availability of energy and food, and maternal factors (including maternal health and knowledge), immunization coverage, and access to clean water. In addition, Harvard T.H Chan (2016) formulated a fundamental change in the approach to correcting stunting, which currently focuses mostly on children. They called for a greater emphasis on interventions

aimed at mothers and environmental factors, such as poor water sources and sanitation.

Conclusion

Based on the 2018 Riskesdas data, the prevalence of stunted toddlers decreased from 2007 (36.8 percent) to 30.8 percent in 2018. The provinces with the highest prevalence of stunted toddlers were East Nusa Tenggara (42.6 percent) and West Sulawesi (41.6 percent), while the provinces with the lowest prevalence were DKI Jakarta (17.7 percent) and D.I. Yogyakarta (21.4 percent). Thus, the central government in synergy with local governments needs to prepare programs and policies related to handling cases of stunted toddlers, especially in provinces/districts/cities that experience high stunting rates.

The prevalence of malnourished and severely malnourished toddlers also decreased from 19.6 percent in 2013 to 17.7 percent in 2018. The province with the highest prevalence of malnutrition and severe malnutrition in 2018 was East Nusa Tenggara (29.5 percent), while the province with the lowest prevalence was Riau Islands (13 percent). The prevalence of overweight toddlers in 2018 reached 8 percent, which decreased from 2013 (11.8 percent). The province of West Nusa Tenggara had the lowest prevalence of overweight toddlers in Indonesia in 2018, which was 3.3 percent, while the province of Papua had the highest prevalence, which was 13.2 percent. The proportion of complete basic immunizations for toddlers decreased from 59.2 percent in 2013 to 57.9 percent in 2018, while the proportion of children who were not immunized increased from 8.7 percent in 2013 to 9.2 percent in 2018. The province of Bali had the highest complete basic immunization coverage in Indonesia in 2018, which was 80.8 percent, while the province of Aceh had the lowest coverage, which was 19.6 percent.

The proportion of WCA experiencing CED in 2018 in Indonesia reached 17.3 percent for pregnant women and 14.5 percent for non-pregnant women. The province with the highest proportion was East Nusa Tenggara with a proportion of 36.8 percent for pregnant women and 32.5 percent for non-pregnant women. Meanwhile, North Kalimantan province had the lowest proportion, which was 1.7 percent for pregnant women and 14.4 percent for non-pregnant women. There were many areas in Indonesia where the adequacy of doctors and midwives was still not met. The lowest proportion for areas with a sufficient number of midwives occurred in D.I. Yogyakarta, followed by DKI Jakarta, West Java, Banten, and East Java. In addition, there were also many areas in Indonesia where the proportion of households using less than 20 liters per person per day, such as Papua, East Nusa Tenggara, West Kalimantan, West Papua, and North Sulawesi.

The results of multiple linear regression analysis indicated that the prevalence of malnourished and severe malnourished toddlers, the prevalence of overweight toddlers, complete basic immunization coverage, the prevalence of CED in WCA, the proportion of villages that have sufficient midwives per population, as well as coverage of access and clean water sources had a significant effect on the prevalence of stunted toddlers in Indonesia. In general, it could be concluded that the factors of poverty (welfare), lifestyle, health services, and access to clean water affect the incidence of stunted toddlers in Indonesia. Based on the results of this regression analysis, it is hoped that policymakers, such as the government and NGOs, pay more attention to these influential determinants so that the stunting rate among toddlers can decrease. The government can focus on policies related to the socio-economic determinants.

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