Regional Disparities of Stunted Toddler in Indonesia

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Abstract

Although there has been a decline in the prevalence of stunting in Indonesia in the past decade, the figure is still the highest among countries in Southeast Asia. The purpose of the study was to analyze the regional disparity of stunted toddlers in Indonesia. The analysis in this study uses data from the 2017 Indonesian Nutritional Status Monitoring. The sample used in this study was 149,571 toddlers aged 0-59 months. Data were analyzed using the Binary Logistic Regression test. Toddlers in the Sumatra region have the possibility of 0.921 times stunted compared to toddlers in the Papua region. The Java-Bali region was 0.805 times more likely than toddlers in the Papua region to be stunted. The Nusa Tenggara Region was 1.39 times more likely than toddlers in the Papua region to be stunted. Kalimantan Region has 1.161 times more likely than toddlers in the Papua region to be stunted. The Sulawesi region has 1.18 times the possibility of toddlers in the Papua region being stunted. Maluku region has a probability of 0.88 times that of toddlers in the Papua region to be stunted. There was a regional disparity of stunted toddler in Indonesia.

Keywords*: child health, child nutrition, health survey*

Background

A linear growth curve for toddlers with age is the best indicator in describing whether there is quality inequality in achieving optimal children's health. Inadequate food in meeting nutritional needs and the emergence of infectious diseases is the direct and most frequent cause of this growth failure[1]. Stunting is a form of growth failure that reflects chronic and multidimensional nutritional problems in the first 1000 days of life that have an impact on the quality of human resources[2]. Decreased cognitive abilities, increased morbidity and the onset of metabolic syndrome in the future are the serious effects of stunting[3].

Stunting is marked by the z value of height according to age below -2 standard deviations from the global growth reference. Data from the Global Health Observatory shows that globally nearly 150 million children under five in the world, or around 21.9%, are still in the stunting category. In line with the agenda of public health priorities in the world, it is expected that the prevalence of stunting will decrease by 2030 to 17.5%[4]. Indonesia is a country with a high enough stunting rate. Indonesia Basic Health Survey data for 2007, 2013 and 2018 show the prevalence of national toddler stunting in Indonesia respectively 36.8%; 37.2%; 30.8%[5]. Although there has been a decrease in the prevalence of stunting in the past decade, the figure still shows more than 30%. This figure is the highest among countries in Southeast Asia. This condition can be interpreted that one in three toddlers born in Indonesia is still stunted. This figure varies in 34 provinces and 541 regencies/cities, which is between 17.6%-42.3%[5].

The success of stunting prevention cannot be separated from cross-sectoral and multidimensional collaboration. One index to measure the success of health development in the national context (Indonesia) is the Public Health Development Index (PHDI). Collection of public health indicators that comprehensively form 1 value that has a connection with life expectancy and is one of the efforts to see the ranking and progress of health development at the regional level[6]. The PHDI data for 2013 and 2018 illustrate the disparity in health development at the regency/city and provincial levels in Indonesia. Differences in the geographical environment, access, socioeconomics as well as human development underlie this inequality. Based on the background, this study was conducted to analyze the regional disparity of

stunted toddler in Indonesia.

Materials and Method

This study analyzes the 2017 Indonesian Nutritional Status Monitoring data (PSG 2017). PSG 2017 was a national-scale survey using a multi-stage cluster random sampling method conducted by the Nutrition Directorate of the Indonesian Ministry of Health[7]. The unit of analysis in this study was toddlers aged 0-59 months. The sample size analyzed in this paper was 149,571 toddlers.

The region was the division of territory grouped by the largest island. Divided into 7 regions, namely Sumatra, Java-Bali, Nusa Tenggara, Kalimantan, Sulawesi, Maluku, and Papua[8,9]. The variable selection was done by using the Chi-Square test to test the dichotomous variable, while for the continuous variable the T-test was used. This statistical test was used to assess whether there was a statistically significant relationship between regional variables and other variables related to the nutritional status of toddlers for height per age. There were 8 variables in 3 groups of variables to be tested, namely the characteristics of children under five (nutritional status and age), the context of the region (urban-rural), and the characteristics of mothers of children under five (age, marital status, education level, work status). A binary logistic regression test was used at the final stage to determine the variables that were predictors of stunting in toddlers in Indonesia.

Findings

The results of the bivariate analysis found that on average each region is dominated by rural areas. On average, each region is dominated by toddlers with normal nutritional status. The largest prevalence of stunted children is in the Nusa Tenggara region. There is a significant difference between the nutritional status of children under five by region category in Indonesia. Table 1 shows that the average age of children under five is slightly older in the Papua region compared to mothers of children under five in other regions. While the average age of mothers of children under five is slightly older in the Nusa Tenggara region compared to mothers of children under five in other regions

Based on marital status, toddlers in all dominant regions have married status. While based on the level of education of mothers of children under five in the region of Sumatra, Java-Bali, Sulawesi, and Maluku, they have a dominant high school education. While the regions of Nusa Tenggara, Kalimantan and Papua predominantly have a primary school and under. Based on work status, mothers of the toddler are dominated by those who do not work.

Table 1 displays the results of the binary logistic regression of the nutritional status of the toddler. Table 1 shows that in the Sumatra, Java-Bali, Nusa Tenggara, Kalimantan, Sulawesi, and Maluku regions, the stunted incidence disparity in toddlers has proven to be significant compared to the Papua region as a reference.

Table 1. Multinomial Logistic Regression of Nutritional Status of Toddler (n=149,571)

Predictors	Stunted		
	OR	Lower Bound	Upper Bound
Region			
Region:Sumatra	***0.92	0.88	0.96
Region:Java-Bali	***0.81	0.77	0.84
Region:Nusa Tenggara	***1.39	1.32	1.48
Region:Kalimantan	***1.16	1.10	1.22
Region:Sulawesi	***1.18	1.13	1.24
Region:Maluku	**0.88	0.82	0.95

Cont... **Table 1. Multinomial Logistic Regression of Nutritional Status of Toddler (n=149,571)**

Area Context			
Area:Urban	***0.81	0.79	0.84
Toddler's Characteristic			
Age	***1.03	1.08	1.03
Mother's Characteristics			
Age	***1.00	0.99	1.00
Marital Status:never married	1.02	0.85	1.22
Marital Status:married	**0.85	0.77	0.94
Education:under primary school	***1.84	1.76	1.93
Education:junior high school	***1.60	1.52	1.67
Education:senior high school	***1.33	1.28	1.39
Work Status:No Work	*1.03	1.00	1.06

Note: Reference category was "normal"; confidence interval of 95% for OR; *p<0.05; **p<0.01; ***p<0.001.

Table 1 informs that toddlers in the Sumatra region are 0.92 times more likely than toddlers in the Papua region to be stunted (OR 0.92; 95% CI 0.88-0.96). The Java-Bali region is 0.81 times more likely than toddlers in the Papua region to be stunted (OR 0.81; 95% CI 0.76-0.84). The Nusa Tenggara Region is 1.39 times more likely than toddlers in the Papua region to be stunted (OR 1.39; 95% CI 1.32-1.48). Kalimantan Region has 1.16 times more likely than toddlers in the Papua region to be stunted (OR 1.16; 95% CI 1.10-1.22). The Sulawesi region has 1.18 times the possibility of toddlers in the Papua region being stunted (OR 1.18; 95% CI 1.13-1.24). Maluku region has a probability of 0.88 times that of toddlers in the Papua region to be stunted (OR 0.88; 95% CI 0.82-0.95). It could be interpreted that toddler in the Sumatra, Java-Bali, and Maluku regions had a lower possibility than the Papua region to be stunted. While the Nusa Tenggara, Kalimantan, and Sulawesi regions had a greater possibility than the Papua region to experience stunted.

The analysis found that toddlers in Sumatra, Java-Bali, and Maluku regions had a lower risk than the Papua region to be stunted, while the Nusa Tenggara, Kalimantan, and Sulawesi regions had a greater risk than the Papua region to be stunted. These results are in line with some of the results of other studies that found that health development in the West (Sumatra, Java-Bali) has a better tendency than in Eastern Indonesia[8,9].

Table 1 informs that toddlers living in urban areas are 0.81 times more likely to be stunted than toddlers living in rural areas. (OR 0.81; 95% CI 0.79-0.84). This means that toddlers living in urban areas were less likely to be stunted. Table 3 also shows that age, both in infants and mothers, proved to be a significant predictor of stunted events in infants.

The analysis shows that urban areas have a lower risk of stunted children. This result is in line with the results of research in several countries which found that people who live in urban areas tend to have better health status. The tendency for better health status in this urban area is found in South Africa and Iran[10,11].

In the context of Indonesia, empirically it is known that the Western region has more urban areas than the Eastern region. The condition of urban areas that are more advanced makes those who live in the area have the opportunity and access to better health services than

those in the Eastern region[12,13]. This phenomenon is exacerbated by conditions in Eastern Indonesia which also tend to have an archipelago topographic, which makes physical access difficult[14].

Table 1 shows that the mother's characteristics found to be predictors, besides age, are marital status, education, and work status. A toddler who has a married mother is 0.85 times stunted than a toddler who has a divorced/widowed mother (OR 0.85; 95% CI 0.77-0.94). This means toddlers who have married mothers have a lower risk of being stunted.

Table 1 shows that the lower the mother's education level, the toddler is more likely to be stunted than a toddler who has a college graduate mother. A toddler who has a non-working mother is 1.03 times stunted than a toddler who has a working mother (OR 1.03; 95% CI 1.28-1.39). This means that toddlers who have mothers who do not work are less likely to experience stunted.

The results of the analysis found that some maternal characteristics also contributed to being stunted in infants. Toddlers who have married mothers have a lower risk of being stunted. Married mothers tend to have better mental states[15] because the mother can share the burden and role with her husband. A better parental process will reduce the risk of fives being stunted[16].

The analysis shows that the lower the mother's education level, the toddler has a greater risk of being stunted. These results are in line with the results of research in Malawi which found that maternal knowledge also became a predictor of undernutrition in infants. Better mother's knowledge will reduce the risk of undernutrition in infants[17]. In line with the results of research in Malawi, findings in India also received the same thing. Women's education can reduce child stunting[18].

Toddlers who have mothers who do not work are less likely to experience stunted. Working mothers tend to have less time for their children. Poor parental time is also known to have a negative impact on the nutritional status of children[19].

Conclusions

Based on the results of the present study, it can be concluded that there was a regional disparity of stunted toddlers in Indonesia. While other variables that were found to influence the stunted toddler were rurality, age of toddler, age of mother, marital status of mother, education level of mother, and work status of mother. The results of this study are important for policymakers to determine the region target of an accelerated intervention program to reduce the prevalence of stunting in children under five appropriately in Indonesia.

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Conflict of Interests: Nil

Ethical Clearance: The PSG 2017 already has an ethical license approved by the National Ethics Committee (ethical number: LB.02.01/2/KE.244/2017). In this survey, informed consent was used during data collection, which considers aspects of procedures for data collection, voluntary and confidentiality.

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