

Ecological Analysis Of Nutritional Status Of Toddler In Indonesia

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Abstract

Toddlers are one of the groups that are prone to experiencing nutritional problems. This can inhibit the mental and physical growth of children and can subsequently have an impact on the next generation. The study was conducted to analyze the relationship between existing environmental variables and the nutritional status of toddlers based on provinces in Indonesia. Further analysis of secondary data from the 2022 Indonesia Nutrition Status Survey and the Central Statistics Agency of Indonesia. This study using quantitative method with univariate and correlation analyses. The unit of analysis in this study is all 34 provinces in Indonesia. The variables analyzed were the number of malnutrition prevalence, the number of poor people, and the level of education. There's wide variability of the number of poor people. The greater the number of poor people, the greater the number of malnutrition events in toddlers. The number of poor people is positively related to the number of malnutrition events in toddlers, be it stunting, wasting, or underweight. Meanwhile, the level of education has no relationship with the prevalence of malnutrition toddlers. The results of this study are considered important as a policy basis to improve the poverty rate and strive for better economic development in Indonesia.

Keywords: education level, nutritional status of toddlers, poverty level

Abstrak

Balita merupakan salah satu kelompok yang rawan mengalami masalah gizi. Hal ini dapat menghambat pertumbuhan mental dan fisik anak dan selanjutnya dapat berdampak pada generasi selanjutnya. Penelitian dilakukan untuk menganalisis keterkaitan variabel lingkungan yang ada dengan status gizi balita berdasarkan provinsi di Indonesia. Analisis data sekunder bersumber dari Survei Status Gizi Indonesia 2022 dan Badan Pusat Statistik Indonesia. Penelitian ini menggunakan metode kuantitatif dengan analisis univariat dan korelasi. Unit analisis dalam studi ini adalah seluruh 34 provinsi di Indonesia. Variabel yang dianalisis adalah prevalensi gizi buruk, tingkat kemiskinan, dan tingkat pendidikan. Didapatkan variabilitas tingkat kemiskinan yang besar pada penelitian ini. Semakin banyak jumlah penduduk miskin, semakin banyak jumlah kejadian gizi buruk pada balita. Jumlah penduduk miskin berhubungan secara positif dengan jumlah kejadian gizi buruk pada balita, baik itu stunting, wasting, maupun underweight. Sementara itu, tingkat pendidikan tidak memiliki hubungan dengan jumlah kejadian gizi buruk pada balita. Hasil penelitian ini dinilai penting sebagai dasar kebijakan untuk melakukan perbaikan angka kemiskinan dan mengusahakan pembangunan ekonomi yang lebih baik di Indonesia.

Kata kunci: status gizi balita, tingkat kemiskinan, tingkat pendidikan

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1. Introduction

Toddlers are one of the groups that are prone to nutritional problems. This is because toddlers require a large amount of nutrient intake to meet their growth and development needs. Errors in reaching the nutritional needs of toddlers will have an impact on later life (WHO, 2018). In some studies such as Fenta *et al.* (2020) and Selvianita *et al.* (2021) mentioned that malnutrition in toddler age inhibits the mental and physical growth of children or better known as growth faltering, where this situation can have an effect on the next generation. Malnutritions are assessed from stunting, wasting, and underweight indicators (WHO, 2019). There are 178-195 million children worldwide who are undernourished, and it is estimated that around 45 million children are wasting, which is malnutrition with a 12-fold risk of death. Indonesia is ranked fifth from all over the world with the largest number of stunting (UNICEF, 2022).

According to Nugroho *et al.* (2021), stunting is a worldwide nutritional problem. In line with the research of Basyariyah *et al.* (2022), there are two major causes of nutritional problems, namely direct and indirect causes. There are two direct causes, namely the type of food consumed and the status of children with infectious diseases. For indirect categories, among others, economic status, education, knowledge, income level, food security, environmental sanitation and utilization of health facilities.

According to Singh *et al.* (2021) and Prasad *et al.* (2021), the prevalence of stunting, undernutrition, and malnutrition in children is higher in mothers who are undernourished, uneducated, live in rural areas, working mothers, giving birth at home, and classified as extreme poor. In the study of Hanifah and Sari (2021), it is said that people with limited economic access (poor) are allegedly at great risk of having toddlers with poor nutrition. A factor that also contributes to maternal undernutrition as well as stunted, undernourished, and malnourished children is low maternal education. According to Rachmah (2021), lack of education will have an impact on

the presentation of unbalanced food in the family, thus affecting the nutritional status of family members.

Reporting from the BPS article (2022), according to the agreement of Indonesia's SDGs target in 2030 “zero” cases of malnutrition. Although there is a decreasing trend in the incidence of malnutrition each year, the rate of malnutrition must be reduced immediately so that the target can be achieved to achieve this goal. According to BPS, Indonesia's poverty rate in September 2022 was 9.57 percent, but poverty rates in each province vary widely. The IDEAS Research Institute predicts that Indonesia's poverty rate in 2022 could potentially rise up to 10.81 percent, equivalent to 29.3 million people. Indonesia is currently in the top 100 poor countries in the world.

According to Aswin and Yasa (2021), poverty can be categorized as not having a job, and generally inadequate health and education levels. BPS noted that the dropout rate in Indonesia has increased in 2022 since 2019 at all levels of education. Darmin *et al.* (2020) said that the higher a person's level of education, the better the knowledge gained, especially in terms of disease prevention. People with low levels of education tend to think irrationally. One of the influencing factors is the lack of information they have. This makes people less aware of the dangers of disease, so there is no awareness to seek accurate treatment or cure. Therefore, the objective of this study was to analyze between poverty and education levels to the prevalence of malnutrition toddlers in Indonesia in 2022.

Therefore, this study will discuss “The ecological analysis between poverty and education levels to the prevalence of malnutrition toddlers in Indonesia in 2022”. The results of this study can be a supporting reason for health policymakers at the provincial and national levels for efforts to improve the nutritional status and education levels and reduce poverty in Indonesia. Furthermore, this study is expected to provide reasons for the government to determine priority programs between poverty, education, or both, where in other studies, the two often run together and are considered equally important.

2. Method

This ecological study-based research used secondary data from the 2022 Indonesian Nutrition Status Survey and the Central Statistics Agency of Indonesia. Data were available at the links www.layanandata.kemkes.go.id and www.bps.go.id. This study was quantitative study. The sample of analysis in this study was 34 provinces of Indonesia (total sampling). The dependent variable was the prevalence of malnutrition (stunting, wasting, and underweight) and the independent variables were the number of poor people and the level of education in each province in Indonesia.

This study using univariate and bivariate analyses. Univariate analysis used minimum and maximum values, mean and standard deviation. Furthermore, the data was entered into a cross tabulation form and divided into 4 interval categories from the smallest percentage to the highest percentage (categories: low, moderate-low, moderate-high, and high) by considering univariate

analysis (minimum and maximum values, mean and standard deviation). Percentage of poor population divided into 4 categories from <7,5% to >17,5% with 5% interval. Stunted toddlers prevalence divided into 4 categories from <15% to >30% with 7,5% interval. Wasting toddlers prevalence divided into 4 categories from <5% to >10% with 2,5% interval. Underweight toddlers prevalence divided into 4 categories from <12,5% to >22,5% with 5% interval. The bivariate analysis examined whether there was a correlation between the dependent and independent variables. This correlation analysis aims to determine the direction and strength of the relationship of the dependent and independent variables in the form of numerical variables.

3. Result and Discussion

Table 1 shows the trend of nutritional status in Indonesia. It appears that stunting cases are always decreasing from year to year, while wasting and underweight cases are increasing in 2022.

Table 1. Percentage of Toddlers' Nutritional States in Indonesia in 2013-2022

Indicator	Riskesdas		SSGI		
	2013	2018	2019	2021	2022
Stunting	37.6	30.8	27.7	24.4	21.6
Wasting	12.1	10.2	7.4	7.1	7.7
Underweight	19.6	17.7	16.3	17	17.1

Source: Badan Kebijakan Pembangunan Kesehatan (2022)

Table 2 shows statistically descriptive of the 5 variables analyzed. There is a very high gap in all variables, except education level which have standard deviation below 1. The lowest prevalence of stunted, wasting, and underweight toddlers is in Bali Province, and

the highest is in Nusa Tenggara Timur Province. The variation in the percentage of the poor population is quite high. The lowest of 4.53% is Bali Province, and the highest proportion of the poor is Papua Province at 26.8%.

Table 2. Descriptive Statistics of Malnutrition Prevalence and Related Variables by Provinces in Indonesia in 2022

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Stunted Toddlers Prevalence	34	8	35.3	23.3	6.42
Wasting Toddlers Prevalence	34	2.8	11.9	8.38	2.08
Underweight Toddlers Prevalence	34	6.6	28.4	18.4	4.74
Percentage of Poor Population	34	4.53	26.8	10.3	5.29
Education Level	34	7.31	11.3	9.25	0.817

Source: Indonesian Central Statistics Agency (2022)

Table 3. Analytical Statistics of the Relationship between Prevalence of Malnutrition among Toddlers with Poverty and Education Level Based on Provinces in Indonesia in 2022

Variables		Stunted Prevalence	Wasting Prevalence	Underweight Prevalence
Percentage of Poor Population	Spearman's rho	0.491	0.339	0.429
	p-value	0.03	0.05	0.011
Education Level	Spearman's rho	-0.321	0.052	-0.222
	p-value	0.064	0.772	0.155

Source: Indonesian Central Statistics Agency (2022)

Based on table 3, it is found that percentage of poor population has a significant positive relationship with stunted, wasted, and underweight toddlers' prevalence. In contrast, education level does not have a significant relationship with stunted, wasted, and

underweight toddlers' prevalence. The following will further discuss the cross tabulation of variables that have a significant relationship.

Table 4. Cross Tabulation of Percentage of Poor Population and Stunted Toddlers Prevalence in Indonesia in 2022

Percentage of Poor Population		Stunted Toddlers Prevalence				Total
		<15%	15-22.5%	22.6-30%	>30%	
<7.5%	n	2	6	6	0	14
	%	14.3	42.9	42.9	0.0	100.0
7.5-12.5%	n	0	8	3	1	12
	%	0.0	66.7	25.0	8.3	100.0
12.6-17.5%	n	0	1	2	2	5
	%	0.0	20.0	40.0	40.0	100.0
>17.5%	n	0	0	1	2	3
	%	0.0	0.0	33.3	66.7	100.0

Table 4 shows the cross tabulation between the prevalence of stunted toddlers and the percentage of the poor population in each province. In the lowest percentage of the poor population category (<7.5%), it appears to be dominated by moderately prevalence of stunted toddlers (15%-30%). While in the category of

the highest percentage of the poor population (>17.5%), it appears to be dominated by a high prevalence of stunted toddlers (>30%). This concludes that the higher the percentage of the poor population in a province, the higher the prevalence of stunted toddlers.

Table 5. Cross Tabulation of Percentage of Poor Population and Wasting Toddlers Prevalence in Indonesia in 2022

Percentage of Poor Population		Wasting Toddlers Prevalence				Total
		<5%	5-7.5%	7.6-10%	>10%	
<7.5%	n	1	3	8	2	14
	%	7.1	21.4	57.1	14.3	100.0
7.5-12.5%	n	0	7	4	1	12
	%	0.0	58.3	33.3	8.3	100.0

Percentage of Poor Population		Wasting Toddlers Prevalence				Total
		<5%	5-7.5%	7.6-10%	>10%	
12.6-17.5%	n	0	1	2	2	5
	%	0.0	20.0	40.0	40.0	100.0
>17.5%	n	0	0	0	3	3
	%	0.0	0.0	0.0	100.0	100.0

Table 5 is a cross tabulation between the prevalence of wasting toddlers and the percentage of the poor population. In the lowest percentage of the poor population category (<7.5%), it appears to be dominated by moderately prevalence of wasting toddlers (5%-10%). While in the category of the highest

percentage of the poor population (>17.5%), it appears to be dominated by a high prevalence of wasting toddlers (>10%). This means that the higher the percentage of the poor population in a province, the prevalence of wasting toddlers is also higher.

Table 6. Cross Tabulation of Percentage of Poor Population and Underweight Toddlers Prevalence in Indonesia in 2022

Percentage of Poor Population		Underweight Toddlers Prevalence				Total
		<12.5%	12.5-17.5%	17.6-22.5%	>22.5%	
<7.5%	n	2	6	4	2	14
	%	14.3	42.9	28.6	14.3	100.0
7.5-12.5%	n	0	7	4	1	12
	%	0.0	58.3	33.3	8.3	100.0
12.6-17.5%	n	1	0	1	3	5
	%	20.0	0.0	20.0	60.0	100.0
>17.5%	n	0	0	1	2	3
	%	0.0	0.0	33.3	66.7	100.0

Table 6 is a cross tabulation between the prevalence of underweight toddlers and the percentage of the poor population. In the lowest percentage of the poor population category (<7.5%), it appears to be dominated by moderately prevalence of underweight toddlers (12.5%-22.5%). While in the category of the highest percentage of the poor population (>17.5%), it appears to be dominated by a high prevalence of underweight toddlers (>22.5%). This means that the higher the percentage of the poor population in a province, the prevalence of underweight toddlers is also higher.

The results of this study indicate that poverty is a factor that has a major contribution to the high prevalence of malnutrition of toddlers in Indonesia. This is in line with Nhimyiryo *et al.*'s study (2019) that the basic concept of growth and development which states that socio-economic factors are variables that have an influence on the quality of growth and development. According to Laksono *et al.* (2019) and Schlichting *et al.* (2019), the poverty factor is considered to be closely related to family characteristics such as education level and purchasing power so that it will affect family access in the search for health

services, providing good quality food and also providing a clean and healthy environment.

Another toddler's nutrition problem is wasting. Factors that lead to under-five wasting are the surrounding environment, poverty, and parenting attitudes, which if these factors are left unchecked, result in under-fives becoming diarrhea and weight loss and decreased immunity which leads to death in toddlers (Renyot and Nai, 2019).

Underweight in toddlers in Indonesia has risk factors such as poverty, food insecurity, infectious diseases, and sanitation conditions. Underweight in toddlers causes other health problems such as toddlers experiencing energy and protein deficiencies, then causing physical, mental, and intellectual disruption in children, as well as low levels of iron in the body which results in undeveloping brain cells, reducing children's brain intelligence by up to 10%, and can cause death (Renyot, 2021).

The results of this study indicate that there is no relationship between education level and the prevalence of stunting. The mother's level of education is associated with the mother's ease of receiving information about nutrition, especially about stunting. Mothers with a high level of education are expected to be more receptive to outside information than mothers with a low level of education. However, mothers with low education do not always have stunted toddlers, and conversely mothers with high education do not always have toddlers who are not stunted. This is because education level is not the only factor affecting stunting. This is in line with the results of study by Rahmawati and Agustin (2020) that there is no relationship between education level and the prevalence of stunting.

However, it is contrary to the results of Budiastutik and Rahfiludin's research (2019) which states that the risk factors for stunting in children in developing countries are the risk of birth length 16.4 times, low education in mothers with a risk of 3.2 times, low birth weight with a risk of 4.5 times, not doing ANC checks with a risk of 3.4 times, not participating in immunization with a risk of 6.3 times, and not receiving exclusive breast milk with a risk of 4 times.

This supports the research of Sihalohe (2024) which states that there is no significant relationship between birth weight history, gestational age, education, employment, number of dependents with the development of wasting toddlers. Multivariate results of factors associated with the development of wasting toddlers internally is the age of toddlers, and external factors are parenting.

According to Octari and Dwiwana (2021), there is a significant relationship between maternal education, toddler food consumption, infectious diseases of diarrhea and fever with the prevalence of wasting in toddlers. In fact, several studies have shown that maternal education has a relationship with the nutritional status of toddler, including the prevalence of underweight. For example, research by Zogara *et al.* (2021), Shaputri and Dewanto (2023), and Suraya *et al.* (2024) conducted in Indonesia found that maternal education was significantly associated with the nutritional status of children under five. Mothers with higher education tend to have better nutrition knowledge and better nutrition behaviors, which can affect their children's nutritional status.

According to Wardhani *et al.* (2021), feeding patterns, income and a history of low birth weight are associated with the nutritional status of toddler. Meanwhile, maternal education and employment are not related to the toddler's nutritional status. The reason is that mothers who have a high level of education are less able to apply their knowledge regarding the nutritional intake of their toddlers, while mothers who have low education tend to seek information about good food intake for their toddlers because knowledge is not only in formal school benches, but can be obtained from various existing sources, including midwives, nurses, nutrition officers so that they can increase knowledge about the nutrition of their toddlers. So that the level of education of parents is not a reference about patterns in child feeding.

4. Conclusion and Suggestion

Based on the data analysis that has been done, it can be concluded that the percentage of the poor population was positively related to the prevalence of stunted, wasting, and

underweight toddlers. Or the less the percentage of the poor population, the less the prevalence of stunted, wasting, and underweight toddlers. While the education level was not related to the prevalence of stunted, wasting, and underweight toddlers.

Suggestions that can be given is that the government can create regular social assistance programs including providing business capital assistance and business coaching for the malnutrition toddler's families, so that the poverty rate can be improved gradually. The results of this study are limited in terms of macro-level policy because the data processed is at the provincial level. Individual and family level are needed for further research as a basis for more detailed policy decisions at the micro-level. In addition, it is recommended that future researchers conduct further and in-depth research on factors that are directly related to the prevalence of malnutrition, especially in toddler in Indonesia in the hope that there will be no more cases of malnutrition in Indonesia by 2030.

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