Underweight among Children under TwoYears in Indonesia

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Abstract

Underweight, have an impact on low cognitive, productivity, and intellectual abilities in children. This study aimed to analyze ecologically the factors related to underweight among children under two years in Indonesia.The study conducted using secondary data from the Indonesia Ministry of Health official report. Apart from the prevalence of underweight in children under two years, four other variables analyzed as independent variables were the percentage of population passing Junior High School, poor population, exclusive breastfeeding, and prevalence of low birth weight.Data were analyzed using cross-tabulation. The results showed there was no relationship between the prevalence of underweight in children under two years with the percentage of population passing Junior High School and the percentage of poor population. Meanwhile, there is a positive relationship between the prevalence of low birth weight with the prevalence of underweight in children under two years. The higher the prevalence of low birth weight, the higher the prevalence of underweight in children under two years. Moreover, the study found the higher the percentage of exclusive breastfeeding, the lower the prevalence of underweight in children under two years in a region. The study concluded that ecologically two variables have an ecological relationship with the prevalence of underweight in children under two years, namely the prevalence of low birth weight and the percentage of exclusive breastfeeding.

Keywords:*ecologicalanalysis, secondary data, under weight, under two years.*

Introduction

Poor nutrition can lead to a poor quality of life too. It is not only the physical development of the child that is disturbed, but also their intellectual development[1]. Several previous studies have revealed that underweight, especially at an early age, will have an impact on children's growth and development. Children who are malnourished will be thin, small, and short. Underweight will also have an impact on low cognitive and intellectual abilities in children, and affect the decline in children's productivity[2].

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The age of 0-24 months (children under two years) is a period of rapid growth and development, so it is often stated as a golden period that can be realized if babies and children receive appropriate nutritional intake for optimal growth and development. Conversely, if at that time the baby does not get food according to nutritional needs, the golden period will turn into a critical period, which will interfere with growth and development at this time and the next. Nutritional problems in babies can harm both of these. If allowed, the bad effects can continue until childhood, even adulthood[1].

In 2018, the national prevalence of children under five years who are underweight in Indonesia is 17.7%. Whereas in the age group under 2 years, the prevalence rate of underweight reached 7.20%. So that the Baduta group dominates the underweight rate at the age of under five years. This achievement still missed the 2019

National Long and Medium Term Development Plan target of 17%[3].

The issue of nutritional status (underweight) is one of the government's focuses to be addressed. This seriousness can be seen from the agreement between the National Planning and Development Agency and the Ministry of Health which determine the targets and strategic directions related to nutrition which are included in the 2020-2024 National Medium-Term Development Plan. Based on the background description, this study aims to analyze ecologically the factors associated with underweight among children under two years in Indonesia.

Materials and Methods

Study Design

The study was designed using an ecological analysis approach. Ecological analysis is a way for researchers to look at the large-scale impact of a policy or specific intervention on the health of a population in an area[4,5].

Data Source

The study was conducted using secondary data from the 2018 Indonesia Basic Health Survey and The 2018 Data and Information of Indonesia Health Profile reports. Both reports were issued officially by the Ministry of Health of the Republic of Indonesia. The unit of analysis in this study is the province. All provinces in Indonesia were analyzed (34 provinces).

Data Analysis

The dependent variable in this study is the prevalence of underweight in children under two years. To assess the nutritional status of children under two years, the bodyweight of each child under two years is converted into a standardized value (Z-score) using the WHO 2005 anthropometric standard for children under five. Furthermore, based on the Z-score value, each of these indicators are determined the nutrition status of children under five. The classification of underweight nutritional status for children under two years was determined based on the weight-for-age index: Z-score <-3.0.

Meanwhile, the independent variables in this study are the percentage of population passing Junior High School, percentage of poor population, prevalence of low birth weight, and percentage of exclusive breastfeeding. All variables are categorized into 3 parts with the same size. Data were analyzed by univariate and bivariate. Bivariate analysis was performed using cross-tabulations. The entire analysis process uses SPSS 16 software.

Results and Discussion

Table 2 shows the descriptive statistics of all variables among underweight children under two years in Indonesia. The number of samples is 34 provinces in Indonesia. Table 2 shows the disparity of the prevalence of underweight in children under two years which is quite wide between provinces with a range of 0.70-7.20.

Table 2.Descriptive statistics of Underweight among Children under Two Years in Indonesia

Descriptive Statistics	Prevalence of underweight in children under two years	Percentage of population passing Junior High School	Percentage of poor population	Prevalence of low birth weight	Percentage of exclusive breastfeeding
N	34	34	34	34	34
Mean	4.5206	90.9932	10.6482	6.2441	61.2312
Median	4.3500	91.4050	8.9050	6.1000	61.1050
Mode	3.40	94.18	7.21	5.80	20.43
Std. Deviation	1.51353	4.92008	5.67326	1.32692	13.52791

Cont... **Table 2. Descriptive statistics of Underweight among Children under Two Years in Indonesia**

Variance	2.291	24.207	32.186	1.761	183.004
Range	6.50	22.78	23.88	6.30	59.85
Minimum	0.70	80.17	3.55	2.60	20.43
Maximum	7.20	102.95	27.43	8.90	80.28

Source: the 2018 Indonesia Basic Health Survey dan The 2018 Data and Information of Indonesia Health Profile

Table 3 shows the cross-tabulation between the prevalence of malnutrition among children under five and the percentage of the population who graduated from junior high school. The results of the analysis show that the low prevalence of underweight in children under two years tends to cause a low percentage of the population who graduated from junior high school.

In general, the results of this analysis do not show a relationship between education and the prevalence of underweight in children under two years. Probably the level of education with the criteria "passing junior high school" is less sensitive to measure ecologically. This is not following several previous studies that found a close relationship between education and nutritional status[6–9].

Table 3. Cross-tabulation between the prevalence of underweight in children under two years with the Percentage of population passing Junior High School

Percentage of population passing Junior High School	**Prevalence of underweight in children under two years**					
	Low (0.70%-3.83%)		**Middle (3.84%-5.10%)**		**High (5.11%-7.20%)**	
	N	**%**	**N**	**%**	**n**	**%**
Low (80.17%-88.49%)	8	30.8	1	25.0	1	29.4
Middle (88.50%-93.19%)	16	61.5	3	75.0	2	61.8
High (93.20%-102.95%)	2	7.7	0	0.0	1	8.8
Total	26	100.0	4	100.0	4	100.0

Source: the 2018 Indonesia Basic Health Survey dan The 2018 Data and Information of Indonesia Health Profile

Table 4 shows the cross-tabulation between the cross-tabulations between the prevalence of underweight in children under two years with the percentage of the poor population. The table shows that the percentage of poor population in high category dominates the prevalence of underweight in children under two years in low category. The results of this analysis indicate a negative ecological relationship between the two variables.

The results of this analysis contradict previous studies that informed a positive relationship between poverty and malnutrition[10]. The more poor people are, the higher the prevalence of malnutrition in a region[11].

Tabel4. Cross-tabulation between the prevalence of underweight in children under two years with the percentage of poor population

Percentage of poor population	Prevalence of underweight in children under two years					
	Low (0.70%-3.83%)		Middle (3.84%-5.10%)		High (5.11%-7.20%)	
	N	%	N	%	N	%
Low (3.55%-7.21%)	6	23.1	1	25.0	2	50.0
Middle (7.22%-12.14%)	6	23.1	1	25.0	0	0
High (12.15%-27.43%)	14	53.8	2	50.0	2	50.0
Total	26	100.0	4	100.0	4	100.0

Source: the 2018 Indonesia Basic Health Survey dan The 2018 Data and Information of Indonesia Health Profile

Table 5 shows the cross-tabulation between the prevalence of underweight in children under five and the prevalence of LBW. The results of the cross-tabulation showed that in areas with a high prevalence of LBW there was also a trend towards the prevalence of underweight among children under five. This means that there is a positive relationship between the prevalence of LBW and the prevalence of LBW in children under five. The higher the LBW prevalence, the higher the LBW prevalence in children under five.

The results of this analysis are in line with previous studies which found that the prevalence of malnutrition was significantly higher in children with LBW than in those with normal birth weight[12]. Meanwhile, another study informed that low birth weight greatly affects the nutritional status of pre-school children[13].

Table 5. Cross-tabulation between the prevalence of underweight in children under two years with thePrevalence of low birth weight

Prevalence of low birth weight	Prevalence of underweight in children under two years					
	Low (0.70%-3.83%)		Middle (3.84%-5.10%)		High (5.11%-7.20%)	
	N	%	N	%	N	%
Low (2.60%-5.80%)	8	30.8	3	75.0	1	25.0
Middle (5.81%-6.53%)	10	38.5	0	0.0	1	25.0
High (6.54%-8.90%)	8	30.8	1	25.0	2	50.0
Total	26	100.0	4	100.0	4	100.0

Source: the 2018 Indonesia Basic Health Survey dan The 2018 Data and Information of Indonesia Health Profile

Table 6 illustrates the cross-tabulation between the prevalence of underweight in children under two years with the percentage of exclusive breastfeeding. Provinces with a high percentage of exclusive breastfeeding tend to have a low prevalence of underweight in children under two years. This means that the higher the percentage of exclusive breastfeeding, the lower the prevalence of underweight in children under two years in that province. This research is in line with previous research which informed that there is a relationship between breastfeeding and nutritional status in children aged 6-12 months. Breastfeeding in children can prevent malnutrition in children[14].

Table 6: Cross-tabulation between the prevalence of underweight in children under two years with thepercentage of exclusive breastfeeding

Percentage of exclusive breastfeeding	Prevalence of underweight in children under two years					
	Low (0.70%-3.83%)		Middle (3.84%-5.10%)		High (5.11%-7.20%)	
	N	%	N	%	N	%
Low (20.43%-55.05%)	7	26.9	4	100.0	0	0.0
Middle (55.06%-69.11%)	9	34.6	0	0.0	3	75.0
High (69.12%-80.28%)	10	38.5	0	0.0	1	25.0
Total	26	100.0	4	100.0	4	100.0

Source: the 2018 Indonesia Basic Health Survey dan The 2018 Data and Information of Indonesia Health Profile

This study has limitations in its use as a policy basis because the data used is aggregate data at the national level. Further research at the individual level is needed to obtain more accurate information in choosing intervention policy.

Conclusions

Based on the results of the study, it can be concluded that two of the four variables analyzed have an ecological relationship with the prevalence of underweight in children under two years. The two variables are the prevalence of low birth weight and the percentage of exclusive breastfeeding.

Acknowledgments: The authors are grateful to the Ministry of Health of the Republic of Indonesia for providing a report as material for analysis in this study.

Source of Funding: Self-funding

Conflict of Interests: Nil

Ethical Clearance: The study was conducted by utilizing secondary data from published reports. For this reason, ethical clearance is not required in the implementation of this study.

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