

Correlation between Nutritional Status and Pneumonia Among 6-59 Months Years Old in Tangerang, Banten

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ABSTRACT

Background: Pneumonia is still causing the most deaths among children in developing countries. This disease often occurs in children under 5 years of age. Nutritional status is a factor that is closely related to infectious diseases such as pneumonia. This study aimed to examine the correlation between nutritional status and pneumonia among 6-59 months years old in Tangerang, Banten.

Subject and Methods: A cross-sectional study was conducted at Pakuhaji Community Health Center, Tangerang, Banten, from January to February 2018. A total of 29 children under five were enrolled in this study. The dependent variable was pneumonia. The independent variable was nutritional status. The data were collected from direct measurement of the children under five and questioner. The data were analyzed by Chi-square.

Results: As many as 16 children under five (55.17%) had pneumonia, 7 children under five (24.13%) were malnutrition, 3 children under five (10.34%) were short, and 5 children under five (7.24%) were thin. Nutritional status based on weight for age and weight for height had differences in nutritional status with the incidence of pneumonia among children under five, and they were statistically significant ($p < 0.001$).

Conclusion: Nutritional status is associate with the incidence of pneumonia among 6-59 months years old (children under five) in Tangerang, Banten.

Keywords: *pneumonia incidence rate, pneumonia, nutritional status, children under five*

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BACKGROUND

World Health Organization (WHO) stated that pneumonia is an infectious disease that causes the most deaths in children around the world, mostly in developing countries in Asia Africa such as: India (48%), Indonesia (38%), and Ethiopia (4.4%), 16% of deaths due to pneumonia occurs in children under 5 years (UNICEF, 2006). Despite advances in antibiotics, pneumonia remains the sixth

leading cause of death in the United States (Price and Wilson, 2006).

The Indonesian Ministry of Health revealed that up to 2014, the incidence of pneumonia in children under five had not changed much, ranging from 20% - 30%, but in 2015 there was an increase to 63.45%. The mortality rate in the under-five group was about 0.16%, in the infant group 0.17%, while in the 1-4-year age group it was 0.15%. Banten Province ranks 5th of all provinces in Indonesia

with a mortality rate of around 0.14% in its children under five group (Ministry of Health, 2015).

The risk factors associated with the incidence of pneumonia are divided into two major groups, namely intrinsic factors and extrinsic factors. Intrinsic factors include age, gender, nutritional status, low birth weight, immunization status, breastfeeding, and vitamin A. Extrinsic factors include cigarette smoke, family income and maternal factors including education, maternal age, and maternal knowledge (Azwar, 2002).

The Ministry of Health of the Republic of Indonesia stated that in 2012 there were 17.9% of under-fives who were malnourished, 13.0% of children under five were malnourished and 4.9% were malnourished (Health department, 2012). Malnutrition is found in children under five years of age 12-59 months. This is because at that age the need for nutrition is increasing (Arisman, 2008). The Banten city government stated that in Tangerang Regency there were around 11,989 children suffering from malnutrition and around 29,412 children suffering from pneumonia (Banten Health Office, 2011).

Many factors play a role in causing pneumonia, one of which is malnutrition. Malnutrition is very closely related to infection, where malnutrition causes a decrease in immune system so that children under-fives are prone to infection (Putri et al, 2015). Based on the description above, the authors want to conduct study to better understand whether there is a relationship between nutritional status and the incidence of

pneumonia in children aged 6-59 months at the Pakuhaji Community Health Center, Tangerang district for the period of January to February 2018.

SUBJECTS AND METHOD

1. Study Design

This was a cross-sectional study conducted at Pakuhaji Community Health Center, Tangerang district for the period of January to February 2018.

2. Population and Sample

The population in this study were all children aged 6-59 months who visited Pakuhaji Community Health Center in January to February 2018. The sample in this study was 29 children who had met the inclusion criteria. The criteria in this study were child patients aged 6-59 months who came to the health center for the period January - February 2018, and child patients who were cooperative for the study. The exclusion criteria in this study were patients with incomplete immunization status, patients who did not have a history of exclusive breastfeeding, patients who had night blindness clinical, patients who had low birth weight, and parents of patients who had a smoking habit. The sampling technique used was purposive sampling.

3. Study Variables

In this study, nutritional status as the independent variable and the incidence rate of pneumonia as the dependent variable

4. Study Instruments

- a. Medical records & questionnaires for pneumonia patients aged 6-59 months at Pakuhaji Community Health Center, Tangerang Regency

- b. WHO - NCHS reference weight for age standard is in the version of the standard deviation score
- c. The reference standard for height or body length for age WHO - NCHS is in the version of the standard deviation score
- d. The reference standard for body weight for height or body length WHO - NCHS in the version of the standard deviation score

The data used in this study were primary and secondary data. The primary data used were taken through direct examination of height, weight, and questionnaires obtained by asking respondents directly to be examined and filling out the questionnaire when they come to the nutrition clinic and at the integrated health post. Secondary data used were taken through patient medical records obtained from Pakuhaji community health center Tangerang district, then the researcher would check the nutritional status and ask the community health

center doctor to find out whether the respondent had pneumonia based on IMCI.

6. Data Analysis

Data were analyzed using univariate and bivariate analysis (Chi-square).

STUDY RESULTS

1. Characteristics of the study subjects

The distribution of children under five according to these characteristics can be seen in Tables 2 and 3. In Table 2, it shows that most of the children under five at Pakuhaji Community Health Center, Tangerang Regency, were male as many as 17 (58.6%). Based on Table 3, it shows the number of under-five patients who came to Pakuhaji community health center with the highest percentage in the 13-24 months age distribution of under-five patients at Pakuhaji Community Health Center, Tangerang Regency, i.e., 10 children under five.

Table 1. Characteristics of the study subjects

Variable	n	%
Gender		
Female	12	41.40%
Male	17	58.60%
Age		
6-12 months	9	31.04%
13-24 months	10	34.48%
25-36 months	7	24.14%
37-48 months	3	10.34%
49-59 months	0	0
Nutritional status		
Good nutrition	21	72.41%
Inadequate nutrition	7	24.13%
Poor nutrition	1	3.44%
Nutritional status		

Normal	25	86.20%
Short	3	10.34%
Very short	1	3.44%
Incidence of pneumonia		
Pneumonia	16	55.17%
Not Pneumonia	13	44.83%

2. Results of Bivariate Analysis

Bivariate analysis in the study was carried out using Chi-Square test. It was found that a $p = 0.011$ stated that H_0 was rejected. This shows that there was a

significant relationship between nutritional status based on body weight and age with the incidence of pneumonia. The results can be seen in Table 7.

Table 2. Relationship between the nutritional status by weight to age with pneumonia incidence

Nutritional Status	Pneumonia				p
	Yes		No		
	n	%	n	%	
Good Nutrition	8	38.09	13	61.9	0011
Inadequate Nutrition	7	100	0	0	
Malnutrition	1	100	0	0	

Based on the results, it was found that $p = 0.152$ which stated that H_0 was accepted. There was no significant rela-

tionship between nutritional status based on height or body length and age with the incidence of pneumonia.

Table 3. Relationship between nutritional status based on height or body length and age with the incidence of pneumonia

Nutritional Status	Pneumonia				p
	Yes		No		
	n	%	n	%	
Normal	12	48	13	52	0.152
Short	3	100	0	0	
Very Short	1	100	0	0	

Based on the results, it was obtained that $p = 0.048$, indicated that H_0 was rejected. There was a relationship between

nutritional status based on body weight on height or body length and the incidence of pneumonia.

Table 4. Relationship between nutritional status based on body weight and height with the incidence of pneumonia

Nutritional Status	Pneumonia				p
	Yes		No		
	n	%	n	%	
Normal	11	45.83	13	54.17	0.048
Thin	5	100	0	0	
Very Thin	0	0	0	0	

DISCUSSION

1. Relationship between nutritional status based on body weight and age and the incidence of pneumonia.

The results of statistical tests with Chi-square showed that there was a significant relationship between nutritional status based on body weight and age with the incidence of pneumonia in children under five years of age 6-59 months at Pakuhaji Community Health Center, Tangerang Regency for the period of January to February 2018 with a $p = 0.011$.

This is in accordance with several previous studies, namely study conducted by Hadiana in 2013 in Surakarta which stated that there was a significant relationship between nutritional status and the occurrence of acute respiratory infections in children under five with $p < 0.001$ and a value of PR (prevalence ratio) = 27.5 (Hadiana, 2013). The same thing was stated by Ratnasari in 2014 which stated that there was a significant relationship between nutritional status and the incidence of pneumonia in children under five (Ratnasari, 2014). Apart from these

two studies, study conducted by Gozali in 2010 stated that there was a relationship between nutritional status and pneumonia classification in children under five with $p=0.01$ (Gozali, 2010).

This is due to a decrease in nutritional status which causes a decrease in body immunity against infection, namely through impaired humoral immunity caused by decreased protein complement, and decreased activity of leukocytes to phagocyte or kill germs (Djuanda, 2011). However, this contradicts a study conducted by Putri et al in 2015 which stated that there was no relationship between nutritional status based on body weight and age with childhood infectious diseases, $p=0.268$ (Putri et al, 2015).

2. The Relationship between Nutritional Status based on Height and Age with the Incidence of Pneumonia.

Based on the results, $p=0.152$ indicating that there was no relationship between nutritional status based on height or body length and age with the incidence of pneumonia in children under five at Pakuhaji Community Health Center, Tangerang Regency.

This is in line with the study conducted by Putri in 2015, where the test results were obtained with a $p=0.580$, where there was no relationship between nutritional status based on height and age with infectious diseases in children under five. This is because measurements based on height for age are often referred to as chronic undernutrition which describes a disturbance in height growth that lasts for quite a long time.

However, it is different from what Wirjatmadi did, in that there was a significant relationship between the frequency of illness and the length of illness on the nutritional status disorders of children based on height to age (Wirjatmadi, 2012).

3. Relationship between nutritional status based on body weight and height and the incidence of pneumonia.

The results of the statistical test could not be carried out by the Chi-Square test because the requirements were not met, so it was carried out Fisher's exact and obtained a $p=0.048$, indicating that there is a relationship between nutritional status based on body weight and the incidence of pneumonia in children under five at Pakuhaji Community Health Center, Tangerang Regency.

The results of the study are in line with study conducted by Citasari in 2015, namely the test results obtained with $p<0.001$, which indicates that there is a relationship between nutritional status based on body weight and height and the incidence of pneumonia in children under five (Citasari, 2015). This is because in malnourished children, physiological processes do not work well, so that the disease agents that should be excreted by the body accumulate in the airways to the lungs.

However, this contradicts a study conducted by Putri in 2015 which stated that there was no relationship between nutritional status based on body weight and height with infectious diseases in children under-fives (Putri, 2015). It was also stated in the study that nutritional

status was not related to the frequency of ARI but those with malnutrition had a risk of 2.18 times the risk of developing ARI (OR= 2.18; p= 0.479) (Alamsyah, 2015).

The conclusion of this study is that this study proves that the incidence of pneumonia in children is still high, especially in children aged 12-24 months. There is a significant relationship between nutritional status based on body weight and age with the incidence of pneumonia in children under the age of 6-59 months with a value of $p = 0.011$. There is no significant relationship between nutritional status based on height and age with the incidence of pneumonia in children under age 6-59 months with $p = 0.152$. And there is a relationship between nutritional status based on body weight and height with the incidence of pneumonia in children under five at 6-59 months with $p = 0.048$.

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