The Relationship between Knowledge and Nutritional Status with the Incidence of Pneumonia in Toddlers at the Medika Utama Manggar Hospital, Balikpapan

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ABSTRACT

Pneumonia is an infectious disease that often affects toddlers due to low immunity, one of which is caused by poor nutrition, so their nutritional status is lacking. The lack of knowledge of mothers, aKnowledgemonia and the lack of proper dietary intake for toddlers can cause this. This study aims to determine the relationship between knowledge and nutritional status and pneumonia incidence in toddlers at the Medika Utama Manggar Balikpapan Hospital. The research design was quantitative, using a correlation research type with a cross-sectional approach. The population of mothers and toddlers treated at the Medika Utama Manggar Balikpapan Hospital who were treated from October to December 2023 was 152 toddlers. The sampling technique was Purposive Sampling with the Slovin formula, which obtained 116 respondents. The data was analyzed using the Spearman Rank. The results obtained were a relationship between knowledKnowledgee incidence of pneumonia (p-value = 0.004) with a correlation of 0.266 (low relationship) and a positive relationship direction. In the nutritional status variable, there is a relationship between nutritional status and the incidence of pneumonia (p-value = 0.000) with a correlation of 0.354 (low relationship) and a positive relationship direction. It can be concluded that the incidence of pneumonia in toddlers can be caused by the lack of knowledge on how to treat pneumonia and the low nutritional status of toddlers. The recommended suggestion is that mothers increase their knowledge to fulfill children's nutrition needs according to their growth and development.

Keywords: Pneumonia, Toddlers, Knowledge, Nutritional Status

INTRODUCTION

Respiratory tract disease is one of the most common causes of death and morbidity in children. One of them is pneumonia. Pneumonia is an acute infection process that affects the lower lung tissue (alveoli); the occurrence of pneumonia in children is often accompanied by an acute process in the bronchi caused by microorganisms such as streptococcus pneumonia, which usually occurs, then streptococcus aureus, Haemophilus influenza, escherichia coli, and pneumocystis jiroveci.1 Pneumonia is a prevalent infectious disease and is spread in almost most endemic developing

countries, including Indonesia. Signs of toddlers getting pneumonia are an increase in breathing frequency so that the child looks short of breath, and in the chest area, there is retraction or pulling of the chest wall at the bottom every time the child takes a breath and tachypnea or rapid breathing.2 Currently, cases of pneumonia in children cause 700,000 deaths each year. Most of these deaths can be prevented through vaccination and access to quality primary health care for the entire population. Immediate action is needed, especially for Sub-Saharan Africa and South Asia, where most cases of childhood pneumonia occur.3

In Indonesia in 2021, the mortality rate of pneumonia in toddlers was 0.16%. The mortality rate due to pneumonia in the infant group is almost twice as high as in the group of children aged 1-4 years. Nationally, the coverage of pneumonia in toddlers is 31.4%, and the province has not reached the target of 65% detection. In East Kalimantan, the coverage reached 13.5%.4 The prevalence of pneumonia in East Kalimantan, especially in Balikpapan City, is 45.4% (East Kalimantan Health Office, 2022). The diagnosis of pneumonia is the most common disease treated at the Medika Utama Manggar Balikpapan Hospital, followed by dengue fever, acute gastroenteritis, febrile seizures, and acute tonsilopharyngitis.

Based on a preliminary study at the Medika Utama Manggar Hospital in Balikpapan, 152 child patients were treated in the last three months, from October to December 2023. Those diagnosed with Pneumonia in October were 26 patients, November 10 patients, and December 20 children, for a total of 65 patients.

Mother's knowledge factors in shaping actions; the level of a mother's knowledge shapes attitudes and behaviors towards something that happens to toddlers, behavior in efforts to prevent pneumonia, namely the efforts of mothers of toddlers in preventing toddlers from contracting pneumonia. Mothers who have good knowledge of toddlers, the prevention efforts made by mothers are better than those mothers who have less knowledge 1 This is reinforced by research that states that there is a relationship between maternal knowledge in toddlers conducted by Winarsih6 with p-value = 0.000 (p-value = <0.05).

Another thing that plays a role in toddlers experiencing pneumonia is their nutritional status. Malnutrition can cause decreased immunity because it affects the formation of toddler antibodies and also decreases lung defenses, so toddlers are at high risk of experiencing pneumonia, where there is an error in providing food intake to children in large quantities without paying attention to the nutritional content in the food..7The research results that state that there is a relationship

between nutritional status and pneumonia in toddlers are studies conducted by Andayani8 with p-value = 0.000 and Prasetyo9 with p-value = 0.03 (p-value = < 0.05).

Based on interviews and observations of researchers on 15 mothers whose children were treated with pneumonia, it was found that 11 out of 15 mothers said that they did not know clearly about pneumonia, the causes of pneumonia, and the symptoms of pneumonia in toddlers. Four of them said they already knew about what pneumonia is, the causes of pneumonia, and the signs and symptoms of pneumonia in toddlers. The author's observation results from measuring the nutritional status of toddlers also show that 7 out of 15 toddlers have malnutrition based on the Indonesian Minister of Health Regulation No. 2 of 2020 according to body weight (BW) and age (BW/A). Namely, 3 males aged 18 months weighed 7.2 kg, 24 months weighed 8.1 kg, and 27 months weighed 8.8 kg, while four females aged 16 months weighed 7 kg, 20 months weighed 7.6 kg, 28 months weighed 8.7 kg, 32 months weighing 9.6 kg, through the results of unstructured interviews regarding their underweight, the toddler's mother stated that her child did not like to eat and when fed had to be coaxed because her child was always fussy and ate for hours often not finishing the food.

Based on the background where pneumonia often occurs repeatedly in children, pneumonia increases the morbidity rate of more children compared to other infectious diseases, so researchers are interested in conducting a study entitled "The Relationship between Knowledge and Nutritional Status with the Incidence of Pneumonia at the Medika Utama Manggar Hospital, Balikpapan," with the aim of the study being to determine whether there is a relationship between maternal knowledKnowledgee nutritional status of their toddlers with the incidence of pneumonia.

METHOD

This study's research design is quantitative, using correlation research with a cross-sectional approach. The population of mothers and toddlers treated at the Medika Utama Manggar Balikpapan Hospital who were treated from October to December 2023 amounted to 152 toddlers. The sampling technique is purposive, using the Slovin formula obtained by 116 respondents. The inclusion criteria for this study were that the mother was willing to be a research respondent, the mother could communicate and understand well in carrying out the research, children aged 0 months to 5 years, children diagnosed with pneumonia do not have comorbidities such as a history of Lower Respiratory Tract Infection, a history of Upper Respiratory Tract Infection, diarrhea,

asthma, asthma in parents, family members with TB infection. Exclusion criteria were that the mother was not cooperative in the research, pediatric patients with chronic/terminal diseases, and families refused to be respondents. The study was conducted in March-June 2024 and this study was conducted in the pediatric inpatient ward of the Medika Utama Manggar Hospital, Balikpapan. The research instruments used were questionnaires to collect demographic data related to the characteristics of respondents and questionnaires containing maternal knowledge. In addition, scales for measuring weight, length, and height of toddlers to measure Body Mass Index (BMI) to determine the nutritional status of toddlers, Observation sheets based on standard anthropometric tables for assessing children's nutritional status based on the Indonesian Minister of Health Regulation no. 2 of 2023. Data were analyzed using the Spearman Rank.

RESEARCH RESULT

1. **Univariate Analysis**

   a. **Respondent Characteristics**

      The characteristics of this study consist of the characteristics of mothers and toddlers, which can be seen in Table 1 below:

      Table 1. Frequency Distribution Based on Respondent Characteristics inManggar Main Medical Hospital, Balikpapan (n=116)

Variables	Category	Frequency (n)	Percentage (%)
Toddler Mother Data			
Age	$\geq$ 26 Years	95	81.9
	10-25 Years	21	18.1
	Total	116	100
Education	DIII	6	5.2
	SENIOR HIGH	87	75.0
	SCHOOL	17	14.7
	JUNIOR HIGH	6	5.1
	SCHOOL	116	100
	SD		
	Total		

Mother's Job	housewife	97	83.6
	Private	12	10.3
	Self-employed	7	6.0
	Total	116	100
Head of Family	Honorary	4	3.4
Occupation	civil servant	5	4.3
	Private	92	79.3
	Self-employed	15	12.9
	Total	116	100
Toddler Data			
Age	> 24 Months	81	69.8
	1 – 23 Months	35	30.2
	Total	116	100
Gender	Man	66	56.9
	Woman	50	43.1
	Total	116	100
Order of Children	1	36	31.0
	2	54	46.6
	3	19	16.4
	4	7	6.0
	Total	116	100

Based on the results of Table 1 above, it shows that most of the respondents' mothers were over 26 years old, namely 95 respondents (81.9%), for the mother's education level was high school, namely 87 respondents (75.0%), the mother's occupation was a housewife (IRT) namely 97 respondents (83.6%) and for the head of the family or father of the toddler was private, 92 respondents (79.3%). In the characteristics of toddlers, most of them were over 24 months old, namely 81 respondents (69.8%); for their gender, they were male, as many as 66 respondents (56.9%), and the order of children in the family was the second child, namely 54 respondents (46.6%).

b. Research Variables

1) Knowledge of Toddler Mothers About Pneumonia in Toddlers

Based on the results of research on mothers' knowledge of toddlers, the following data was obtained:

Table 2 Frequency Distribution Based on Knowledge of Toddler Mothers inManggar Main Medical Hospital, Balikpapan (n=116)

Variables	Category	Frequency (n)	Percentage (%)
Knowledge	Not enough	25	21.6
	Enough	54	46.6
	Good	37	31.9
	Total	116	100

The results of Table 2 above show that toddlers' knowledge of pneumonia is mostly sufficient. Namely, 54 people (46.6%), then good knowledge 37 respondents (31.9%), and the lowest is less knowledgeable, 25 respondents (21.6%).

2) Toddler Nutritional Status

Based on the results of measurements of the nutritional status of toddlers based on BMI/A, the following results were obtained:

Table 3 Frequency Distribution Based on Nutritional Status of Toddlers inManggar Main Medical Hospital, Balikpapan (n=116)

Variables	Category	Frequency (n)	Percentage (%)
Nutritional	Thin	21	18.1
status	Obesity	17	14.7
	More Nutrition	19	16.4
	Risk of Overnutrition	12	10.3
	Good	47	40.5
	Total	116	100

The results of Table 3 above show that the nutritional status of most toddlers is good, namely 47 respondents (40.7%), then thin, namely 21 respondents (18.1%), and the lowest is at risk of overnutrition, 12 respondents (10.3%).

3) Pneumonia Occurrence

Based on the results of the respondent's medical records regarding the diagnosis of the disease, the following results were obtained:

Table 4 Frequency Distribution Based on the Incidence of Pneumonia in Toddlers inManggar Main Medical Hospital, Balikpapan (n=116)

Variables	Category	Frequency (n)	Percentage (%)
Pneumonia	Yes	41	35.3
Occurrence	No	75	64.7
	Total	116	100

The results of Table 4 above show that the majority of respondents had a cough but not pneumonia: 75 respondents (64.7%) and 41 respondents (35.3%) had pneumonia.

2. **Bivariate Analysis**

a. **Knowledge Relationship with the Incident of Pneumonia in Toddlers at the Main Medika Hospital Manggar Balikpapan**

The relationship between knowledKnowledgee incidence of pneumonia in toddlers at the Medika Utama Manggar Balikpapan Hospital can be seen in the table below:

Table 5. Relationship between KnowledKnowledgee Incidence of Pneumonia in Toddlers inManggar Main Medical Hospital Balikpapan

Variables	N	R	*P value*
Relationship between Mother's Knowledge and the Incidence of Pneumonia in Toddlers	116	0.266	0.004

Based on table 5 shows the results of statistical tests using Spearman, obtained a result of 0.004 where p <0.05, then Ho is rejected, which means there is a relationship between maternal knowledKnowledgepneumonia and the incidence of pneumonia at the Medika Utama Manggar Hospital Balikpapan with a correlation coefficient value for the knowledge variable of 0.266. This shows a low relationship between maternal knowledge and the incidence of pneumonia. The direction of the relationship is positive, meaning that the better the mother's knowledge of pneumonia, the better the prevention of pneumonia, and vice versa.

b.   Relationship of Nutritional Status with Pneumonia Incidence in Toddlers

The relationship between nutritional status (BMI/A) and the incidence of pneumonia in toddlers at the Medika Utama Manggar Balikpapan Hospital can be seen in the table below:

Table 6. Relationship between Nutritional Status and the Incidence of Pneumonia in Toddlers inManggar Main Medical Hospital Balikpapan

Variables	N	R	*P value*
Relationship between Nutritional Status and Pneumonia Incidence in Toddlers	116	0.354	0,000

Based on table 6 shows the results of statistical tests using Spearman, obtained a result of 0.000 where p <0.05, then Ho is rejected, which means there is a relationship between the nutritional status of toddlers and the incidence of pneumonia at the Medika Utama Manggar Hospital, Balikpapan with a correlation coefficient value for the nutritional status variable of toddlers is 0.354. This shows a low relationship between toddlers' nutritional status and pneumonia incidence. While the direction of the relationship is positive, meaning that the better the nutritional status of toddlers, the lower the incidence of pneumonia or no pneumonia occurs, and vice versa.

DISCUSSION

The Relationship Between Mother's Knowledge and the Incidence of Pneumonia in Toddlers at the Medika Utama Manggar Hospital, Balikpapan

The statistical results of the study showed that the p-value was 0.004 where $p < 0.05$ then Ho was rejected, which means that there is a relationship between maternal knowledKnowledgepneumonia and the incidence of pneumonia with a correlation coefficient value for the variable maternal knowledKnowledgepneumonia of 0.266. This shows a low relationship between maternal knowledge and the incidence of pneumonia. The direction of the relationship is positive, meaning that the better the mother's knowledge of pneumonia, the better the prevention of pneumonia, and vice versa. This study's results align with the research conducted by Purwati10, which statistically obtained a relationship between maternal knowledge and the incidence of pneumonia in toddlers. Knowledge is a very important part of someone's actions, while the depth of their knowledge is known through their levels. Starting from the level of knowing, someone can only mention terms based on what they have learned and experienced. Then, enter the level of understanding, application, analysis, synthesis, and evaluation, in this case, the ability to assess a material based on existing criteria.11

Lack of parental knowledge will certainly affect the incidence of pneumonia in toddlers, and the questionnaire results show that, in general, respondents do not know about the causes of pneumonia, how pneumonia is transmitted, and the prevention of pneumonia. Knowledge is an important factor that influences a person's behavior. Respondents who do not know about pneumonia will influence their behavior in keeping children away from the causes of pneumonia. What mothers can do to prevent it is to maintain the child's nutritional status so that it remains good, immunization, personal and environmental hygiene, and prevent children from coming into contact with pneumonia sufferers. In addition, parents can distinguish between children who suffer from pneumonia and those who do not suffer from pneumonia, as well as the causes of the disease, prevention of the disease, and so on.

According to the researcher, the understanding of pneumonia, which is still mostly sufficient, and there are still some lacking by 21.6%, is a concern for health workers. Mothers need to be educated about prevention and caring for children so they do not experience pneumonia again and prevent coughs from becoming pneumonia. So it is recommended that health workers provide health education using media such as posters, leaflets, and counseling materials regarding pneumonia, which include the definition of pneumonia, symptoms of pneumonia, causes of pneumonia, how

pneumonia is transmitted, and how to prevent pneumonia so that mothers can understand. Then, parents can recognize and carry out treatment and care for their children better.

Relationship Between Nutritional Status and Pneumonia Incidence in Toddlers at the Medika Utama Manggar Hospital, Balikpapan

The statistical research results show that the p-value is 0.000 where p <0.05, then Ho is rejected, which means there is a relationship between the nutritional status of toddlers and the incidence of pneumonia at the Medika Utama Manggar Hospital Balikpapan with a correlation coefficient value for the nutritional status variable of toddlers of 0.354. This shows a low relationship between toddlers' nutritional status and pneumonia incidence. The direction of the relationship is positive, meaning that the better the nutritional status of toddlers, the lower the incidence of pneumonia or no pneumonia, and vice versa.

Providing nutrition based on the growth and development of toddlers can prevent toddlers from various infectious diseases so that the growth and development of children is optimal. Nutritional status places toddlers at increased risk of pneumonia in two ways. First, malnutrition of both micronutrients and macronutrients can weaken the immune system of toddlers. Second, lack of nutrition in toddlers can also undermine the respiratory muscles, which can inhibit the respiratory system in toddlers. In addition, it can reduce the immune capacity to respond to pneumonia infections, including granulocyte disorders, decreased complement function, and also cause micronutrient deficiencies.[12]

In this study, respondents with good infant nutritional status were also found to suffer from pneumonia. Based on the researcher's assumption, this occurs because of environmental factors where the infant lives that support the occurrence of pneumonia, where there are residents (parents) who have a habit of smoking in the house. Where infants who are exposed to cigarette smoke are at risk of getting pneumonia, it is recommended that parents understand the causes of pneumonia and recurrent coughs in their children so that hospital care is needed while maintaining the nutrition that comes in when the child is sick so that the immune system is maintained so that they can recover quickly.

CONCLUSION

The results of the research data obtained are that there is a relationship between the nutritional

status of children and the incidence of pneumonia with a correlation coefficient value of 0.354 (low relationship), and the direction of the relationship is positive, meaning that the better the nutritional status of toddlers, the incidence of pneumonia in toddlers will decrease. It is recommended for health workers that in addition to providing care in hospitals, they can also offer education in the form of counseling to parents of respondents regarding pneumonia both in terms of treatment and prevention and provide nutrition that is by the child's needs to maintain their immune system. For parents of respondents, it is essential to increase their knowledge of pneumonia and the causes of pneumonia so that they can avoid the causes of pneumonia in their toddlers.

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