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## **THE CORRELATION OF NUTRITIONAL STATUS AND ACUTE RESPIRATORY TRACT INFECTIONS FOR CHILDREN UNDER FIVE IN WEST HALMAHERA**

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### **Abstract**

*Acute respiratory tract infections (ARIs) are still a public health problem at present. This disease is very dangerous because it can be a precursor to pneumonia and stunting in children. The aim of this research is to determine the relationship between nutritional status and the incidence of ARIs in Akelamo Village, East Sahu District, West Halmahera Regency, North Maluku Province, Indonesia. The crosssectional methods were used in this research. The total population was 52 children which were then calculated using proportional sampling techniques to obtain 37 children as the research sample. The research results show that the child's nutritional status and the mother's education level have a significant relationship with the occurrence of Acute respiratory tract infections. Therefore, the role of health workers is very necessary to provide education about the use of local food to improve children's nutrition and education about preventing ARIs needs to be carried out more intensively.*

**Keywords:** ARIs, nutritional status, children under five, education of caregiver

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@Jurnal Ners Prodi Sarjana Keperawatan & Profesi Ners FIK UP 2024

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## BACKGROUND

Nutritional status significantly influences the occurrence and severity of acute respiratory tract infections (ARIs) in children under five years old. Malnutrition has been identified as a notable risk factor for ARIs (Alemayehu et al., 2019). Research has demonstrated a clear relationship between nutritional status and the prevalence of pneumonia in the under five years old age group (Adriani & Simarmata, 2022). Improving children's nutritional status has been proposed as an effective intervention to decrease the incidence of pneumonia (Mengstie, 2022).

Moreover, undernourished children are more vulnerable to infections, including respiratory tract infections (Murarkar et al., 2020). Studies have highlighted a correlation between weight and hypoxemia in children with acute lower respiratory tract infections, emphasizing the impact of nutritional status on respiratory health (Karthikeyan & E, 2020). Additionally, the recurrence of infections such as stunting, diarrhea, and acute respiratory infections in toddlers has been associated with each other (Arini et al., 2020).

It is crucial to consider the broader context in which these infections occur. Factors like exposure to biomass fuel smoke, unhealthy home environments, and inadequate sanitation facilities have been linked to an increased risk of respiratory infections among children (Asyiroh et al., 2021). Furthermore, socioeconomic status, overcrowding, and the educational levels of caregivers also influence the prevalence of ARIs (Addisu et al., 2021; Noorani et al., 2020). The correlation between nutritional status and acute respiratory tract infections in children under five is well-established. Addressing malnutrition, improving living conditions, and enhancing caregiver knowledge are essential steps in reducing the burden of ARIs in this vulnerable population.

Data from the Public Health Center at the research location, West Halmahera Regency, North Maluku Province, in 2020, patients diagnosed with ISPA were the most common compared to other diseases. Based on the researcher's observations from the researcher's home environment, there were 8 children who experienced symptoms of ISPA. Then, as a result of interviews with health workers at the Community Health Center, there were always patients under five with a diagnosis of ISPA who

had abnormal nutritional status. Based on the description above, researchers are interested in conducting research on the relationship between the nutritional status of children under five and acute respiratory infections in Akelamo Village, East Sahu District, West Halmahera District.

## METHOD

This Study uses an analytical survey method with a cross sectional approach, namely a research design by carrying out measurements or observations at the same time or at one time. The research was conducted in August-October 2020 in Akelamo Village, East Sahu District, West Halmahera Regency, North Maluku Province.

The population of this study was children under five in Akelamo Village, totaling 52 children. After calculations were carried out using the proportional sampling method, the sample size was 37 children.

This study used a questionnaire to ask for general data about the child, including the child's age, and in determining the nutritional status of toddlers, the researcher used a child's weight scale and then related the child's weight to age to calculate the z-score formula. The researcher also took data on the child's height as supporting data. for height for age.

To determine whether a child has an ISPA, the researcher uses an observation sheet, namely that there are three signs needed to initially detect someone experiencing an ISPA. In the observation sheet, the researcher determines a child has an ISPA if the child experiences three or more signs of an ISPA, although in determining whether a person has an ISPA, further diagnosis is needed.

Before data collection, respondents received an explanation of the aims and benefits of the research. Then given a consent form as a respondent. Questions were open, respondents have the right not to provide data, information and answer questions from researchers.

The results of this research were analyzed in univariate and bivariate using SPSS software.

## RESULTS AND DISCUSSION

Table 1 below shows the highest number of toddlers is 3 years old with 17 toddlers or 45.9%, and the minimum toddler age is 1 year with 4 toddlers or 10.8%. The gender of toddlers, where the toddlers sampled in this study were mostly male (54.1%) compared to female toddlers (45.9%). Most toddlers in this study did not

experience ARIs with 22 toddlers or 59.5% and 15 toddlers who experienced ARIs or 40.5%. Most toddlers have good nutritional status (56.8%) compared to toddlers who have poor nutritional status (43.2%).

Tabel 1. Characteristics of children

Variable	n	%
<b>Age (month)</b>		
6 - <24	4	10.8
24 - <36	6	16.2
36 - <48	17	45.9
48 - <60	10	27.0
<b>Sex</b>		
Male	20	54.1
Female	17	45.9
<b>Nutritional status</b>		
Good	21	56.8
Poor	16	43.2
<b>ARIs</b>		
No	22	59.5
Yes	15	40.5

Table 2 shows information about the highest maternal age was in the 26-30 year age group with 17 mothers (45.9%) and the lowest maternal age group was mothers aged 21-25 years (5.4%). The majority of mothers had elementary school education, with 15 mothers (40.5%) and the fewest mothers with tertiary education, namely 1 mother (2.7%).

Tabel 2. Characteristics of caregivers

Variable	n	%
<b>Age (year)</b>		
21-25	2	5.4
26-30	17	45.9
31-35	14	37.8
36-40	4	10.8
<b>Eduction levels</b>		
Elementary school or under	15	40.5
Secondary school	10	27.0
Senior High School	11	29.7
University	1	2.7

Table 3 below provide information about result of chi square analysis. The correlation of nutritional

status, education levels of caregivers had significant to affect the children under five years to get ARIs. Whereas aged of children, sex of children, aged of caregivers were not related to cause of ARIs for children.

Tabel 3. Chi-square analysis of all variables

Variables (children)	ARIs		$\rho$	Crude OR
	No	Yes		
<b>Age (month)</b>			0.322	1.265
6 - <24	1	3		
24 - <36	3	3		
36 - <48	9	8		
48 - <60	9	1		
<b>Sex</b>			0.114	3.121
Male	12	8		
Female	10	7		
<b>Nutritional status</b>			<0.000	7.619
Good	20	1		
Poor	2	14		
<b>Variables (caregivers)</b>				
<b>Age (year)</b>			1.000	2.370
21-25	0	2		
26-30	11	6		
31-35	7	7		
36-40	4	0		
<b>Eduction levels</b>			<0.000	3.491
El-school or under	7	8		
Secondary school	4	6		
Sen-high School	10	1		
University	1	0		

Based on all of the result above, nutritional status is a critical factor influencing the susceptibility of children under five to acute respiratory tract infections (ARIs). Several studies have demonstrated a strong correlation between nutritional status and the incidence of respiratory infections in this age group. For example, examined the relationship between the nutritional status of children under five and respiratory tract infections during the COVID-19 pandemic (Mulyani et al., 2022). Similarly, investigated the patterns of respiratory tract infections in Egyptian children under five, highlighting associations with socio-demographics and nutritional status (El-Koofy et al., 2022).

Moreover, previous research found a significant link between nutritional rickets and acute lower respiratory tract infections, indicating the impact of specific nutritional deficiencies on

respiratory health (Thakur & Kumar, 2020). Additionally, explored various socio-demographic and nutritional risk factors associated with acute lower respiratory tract infections among children aged 6 to 60 months, emphasizing the multifactorial nature of these infections (Noorani et al., 2020). The prevalence of undernutrition and the role of vitamin D deficiency in lower respiratory tract infections, further highlighting the intricate relationship between nutritional status and respiratory health in young children (Barania et al., 2020; Murarkar et al., 2020).

Exclusive breastfeeding and a child's birth weight will influence the child's nutritional status. So it has the potential to have a significant relationship with the incidence of ARIs (Saputri et al., 2023). Apart from that, living in a crowded environment such as living in a room, parents who smoke, the type of cooking fuel that causes children to be exposed to smoke are also determining factors for the occurrence of ARIs in children (Apriyanti & Dhilon, 2022).

The collective evidence from these studies underscores the importance of maintaining optimal nutritional status in children under five to mitigate the risk of acute respiratory tract infections (Palapessy et al., 2023). Addressing nutritional deficiencies and promoting healthy dietary practices are crucial steps in enhancing the respiratory health of young children.

## CONCLUSION

The relationship between nutritional status and the incidence of ARIs in children has significant results. Apart from that, it was also found that another variable, namely the mother's education level, also had a significant relationship with the incidence of ARIs in children. Therefore, the role of community health centers in providing education on local food processing along with preventing ARIs at research locations is very much needed.

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