

## Relationship between nutritional status, vitamin A administration, immunization status, exclusive breastfeeding with the incidence of respiratory infections in toddlers aged 0-59 months in the working area of the Nambo Health Center, Kendari City, 2023

Fithria Nurul Azizah Manshur \* and La Ode Liaumin Azim

*Public Health Study Program, Faculty of Public Health, Halu Oleo University, Indonesia.*

World Journal of Advanced Research and Reviews, 2023, 19(01), 1189–1196

Publication history: Received on 07 May 2023; revised on 22 July 2023; accepted on 24 July 2023

Article DOI: <https://doi.org/10.30574/wjarr.2023.19.1.1174>

### Abstract

**Background:** Acute respiratory infection (ARI) is an infectious disease that is often experienced by toddlers. Several efforts can be made to reduce the risk of ARI, including nutritional status, administration of vitamin A, immunization status, and exclusive breastfeeding. The incidence of ARI in toddlers in the working area of the Nambo Health Center, Kendari City, is one of the most common diseases compared to other diseases. The aim of the study was to determine the relationship between nutritional status, administration of vitamin A, immunization status, and exclusive breastfeeding with the incidence of ARI in toddlers aged 0-59 months.

**Method:** Quantitative research with a cross-sectional study design. The sample in this study were toddlers aged 0-59 months totaling 254 respondents obtained by accidental sampling technique. Nutritional status is assessed based on anthropometric data in the form of body weight/age and is interpreted with a Z-score according to WHO standards. Data was collected from respondents using a questionnaire. Data analysis was performed with the chi-square statistical test.

**Result:** that most of the infants aged 0-59 months had normal nutritional status 87.0%, incomplete vitamin A administration 53.1%, incomplete immunization status 56.7%, exclusive breastfeeding was not given 55.9%, and most toddlers 0-59 months suffer from ISPA incidence of 57.1%. Analysis of the variable relationship obtained a *p* value of 0.000 ( $p < 0.05$ ) that statistically there was no significant relationship between nutritional status and the incidence of ARI, there was a significant relationship between vitamin A administration, immunization status and exclusive breastfeeding on the incidence of ARI in toddlers 0-59 months in the working area of the Nambo Health Center.

**Conclusion:** There is no relationship between nutritional status and the incidence of ARI, there is a relationship between vitamin A administration and the incidence of ARI, there is a relationship between the immunization status and the incidence of ARI, there is a relationship between exclusive breastfeeding and the incidence of ARI.

**Keywords:** Nutritional Status; Incidence Of ARI; Administration of Vitamin A; Immunization Status; Exclusive Breastfeeding

### 1. Introduction

Acute Respiratory Infection (ARI) is an infectious disease that is often experienced by toddlers, and often ranks first in the infant mortality rate[1]. Globally, ISPA is reported as the main cause of child morbidity (illness) and mortality

\* Corresponding author: Nurul Azizah Manshur

(death), with a higher impact on children under the age of five. In developing countries there is evidence that every year, an estimated 12 million children under five are hospitalized due to acute respiratory infections[2]. Based on data from the World Health Organization (WHO) it shows that globally there are 15% or 808,694 cases of death due to ARI in children under 5 years of age[3].

Indonesia, Acute Respiratory Infection (ARI) always ranks first as a cause of death in the infant and toddler group. Apart from that, ARI is also often included in the top 10 lists of diseases in hospitals and health centers. The mortality survey conducted by the ISPA sub-directorate placed ISPA as the biggest cause of infant death in Indonesia with a percentage of 32.10% of all under-five deaths. The prevalence of ARI in Indonesia is 9.3% with an incidence range of around 9.2% - 9.4% with 16 provinces including having a prevalence above the national rate [4].

Data from the Southeast Sulawesi Provincial Health Office show that ARI cases in 2020 totaled 115,331 cases, while in 2021 there were 137,123 cases. The high number of ISPA cases is inseparable from unfavorable weather and environmental factors in addition to lifestyle problems that have not adopted a healthy and nutritious lifestyle. Based on data from the Kendari City Health Office, there will be 5,568 cases of ISPA in 2021. Meanwhile, ISPA cases in 2022 are 8,295 cases. ARI in Kendari City becomes a disease trend every year [5].

In general, there are 3 main factors for the occurrence of ARI, namely, individual child factors, behavioral factors, and environmental factors. Individual factors of the child include the child's age, low birth weight, nutritional status, immunization status, and vitamin A. Behavioral factors include the use of fuel, and smoking behavior. While environmental factors include air pollution in the house, the physical condition of the house, and the density of the house. The practice of handling ARI in the family, whether carried out by the mother or other family members, is very important for the prevention and control of ARI in infants and toddlers [4].

Nutritional status is one of the factors that can cause ARI. The incidence of ARI in toddlers with less nutritional status is higher than children who have good nutritional status. This is because toddlers who have good nutritional status will have more resistance (antibodies), so they can prevent or avoid diseases such as ISPA [6].

According to research conducted by Yusridawati, 2021, at the Batang Kuis Health Center, Deli Serdang Regency, it also showed that the majority of the nutritional status of toddlers, namely malnutrition, was 15 people (57.7%), the incidence of ARI was as many as 18 people (69.2%), and it was found that there was a relationship between Nutritional Status and the Incidence of Acute Respiratory Infection (ARI) in Toddlers at the Batang Kuis Health Center, Deli Serdang Regency.

Apart from nutritional status, vitamin A is no less important for the immune system. The problem of vitamin A deficiency is one of the main nutritional problems in Indonesia with a high prevalence in women and children under five. This high prevalence is the main cause of increased morbidity, mortality and blindness. High-dose vitamin A supplementation given twice a year has been shown to improve vitamin A status, and is safe [4].

According to Sari's research, 2019, it stated that there was a relationship between giving Vitamin A and the incidence of ARI. It was found that 69 respondents (71.4%) were toddlers who received vitamin capsules, while the number of toddlers who had never experienced ARI was 56 respondents (56.4%). Based on the test results, it was found that there was a significant relationship between the administration of vitamin A capsules and the incidence of ARI [8].

Based on data from the Central Statistics Agency for Kendari City 2020, toddlers aged 0-59 months who have an immunization card (84.73%) and get complete immunization (54.46%). To overcome the high incidence of ARI, the Indonesian government, in this case the Indonesian Ministry of Health, has carried out an immunization program that aims as primary prevention against diseases that cause ARI. In theory, by giving complete and regular basic immunizations, the baby or child's body will have immunity so that it can fight dangerous diseases. The body's resistance increases not only against diseases that are immunized, immunity also appears against the causes of ARI [7].

This is supported by research conducted by (Fatimah, 2022) that 34 toddlers who experienced acute respiratory infections (ARI) with incomplete immunization (68.0%) while toddlers who received complete immunization were 16 people (32.0%). and in toddlers who experienced ARI for the first time as many as 32 people (64.0%) and ARI recurring as many as 18 people (36.9%). The results of this study indicate that there is a relationship between immunization status and ARI in sick toddlers (1-5 years).

Exclusive breastfeeding is a risk factor for ARI. The high nutritional content in breast milk is not only important for meeting the nutritional needs of children, but also for preventing disease in children. Breast milk can prevent the

occurrence of ARI in infants because it has a unique anti-infective component. The content of Immunoglobulin A in breast milk colostrum plays an important role in preventing toddlers from the risk of acute respiratory infections

research conducted by Wafi, 2020 shows that as many as 58.5% of toddlers do not have a history of exclusive breastfeeding and as many as 53.8% are exposed to ARI. Based on the results of statistical tests, it was found that there was a relationship between a history of exclusive breastfeeding and the incidence of acute respiratory infections (ARI) in toddler.

The Nambo Health Center is the agency responsible for health development in the Nambo District Area, has made many health efforts to address health problems in the Nambo sub-district, in particular efforts to control the incidence of ARI, through ARI control programs and education to community leaders.

Based on the results of initial observations conducted on December 5, 2022 at the Nambo Health Center, Kendari City, it was found that 8 mothers who had toddlers in the working area of the Nambo Health Center stated that 7 mothers who had children under five had poor or poor nutritional status. According to the Nambo Health Center, the cases of undernutrition were caused by co-morbidities and Protein Energy Deficiency (KEP). Then 5 mothers with toddlers did not receive vitamin A supplements. This is in line with a report from the Kendari City Health Office that the coverage of vitamin A administration over the past 5 years is still low. This is due to the inconsistent determination of program targets, especially the target of toddlers and the lack of socialization regarding the provision of vitamin A to the community. As for 3 mothers who have children under five do not have complete basic immunization status. This is generally caused by mothers who do not know the immunization schedule and the toddler is sick. An initial survey was also carried out regarding exclusive breastfeeding that there were 5 mothers who had children under five who did not give exclusive breastfeeding. This is also in line with the Nambo Health Center that the coverage of toddlers who are given exclusive breastfeeding is still lacking. And due to the dominant characteristics of the people who are self-employed workers, laborers and fishermen.

For this reason, researchers are interested in conducting research with the title "The Relationship between Nutritional Status, Administration of Vitamin A, Immunization Status, and Exclusive Breastfeeding with ARI Incidence in Toddlers aged 0-59 Months in the Working Area of the Nambo Health Center, Kendari City.

---

## 2. Materials and Methods

This study was a quantitative research with a cross-sectional study design. The population in this study were all toddlers aged 0-59 months who visited and registered at the Nambo Health Center in Kendari City in 2022, totaling 703 toddlers. The sample in this study were toddlers aged 0-59 months totaling 254 respondents obtained by accidental sampling technique. Nutritional status is assessed based on anthropometric data in the form of body weight/age and is interpreted with a Z-score according to WHO standards. Data was collected from respondents using a questionnaire. Data analysis was performed with the chi-square statistical test.

---

## 3. Result and Discussion

### 3.1. Univariate analysis

The results of the univariate analysis of the incidence of ISPA in toddlers can be seen in table 1 below.

**Table 1** Distribution of ISPA incidence in Toddlers Aged 0-59 Months in the Working Area of the Nambo Health Center, Kendari City, 2023

ARI incident	n	%
ISPA	145	57.1
No ISPA	109	42.9
Total	254	100

Resource: Primary Data, April 2023

The table above shows that of the 254 respondents who had ISPA, there were 145 respondents (57.1%) and those who did not suffer from ISPA were 109 respondents (42.9%).

The results of the univariate analysis of nutritional status in toddlers can be seen in table 2 below.

**Table 2** Distribution of Nutritional Status in Toddlers Aged 0-59 Months in the Work Area of the Nambo Health Center, Kendari City in 2023

Nutritional Status	n	%
Malnutrition	33	13.0
Good/Normal Nutrition	221	87.0
Total	254	100

Resource: Primary Data, April 2023

The table above shows that out of 254 respondents for nutritional status, most of them had good nutritional status, namely 221 respondents (87.0%), while for poor nutritional status, there were 33 respondents (13.0%).

The results of the univariate analysis of giving vitamin A to toddlers can be seen in table 3 below.

**Table 3** Distribution of vitamin A administration to toddlers aged 0-59 months in the working area of the Nambo Health Center, Kendari City, 2023

Administration of vitamin A	n	%
Complete	119	46.9
No complete	135	53.1
Total	254	100

Resource: Primary Data, April 2023

The table above shows that of the 254 respondents who were given vitamin A, most of them were incomplete, namely 135 respondents (53.1%), while for the provision of vitamin A, most of them were complete, namely as many as 119 respondents (46.9%).

The results of the univariate analysis of immunization status in toddlers can be seen in table 4 below

**Table 4** Distribution of Immunization Status for Toddlers Aged 0-59 Months in the Working Area of the Nambo Health Center, Kendari City, 2023

Immunization Status	n	%
Complete	110	43.3
No complete	144	56.7
Total	254	100

Resource: Primary Data, April 2023

The table above shows that of the 254 respondents for immunization status, most of them were incomplete, namely 144 respondents (56.7%), while for complete immunization status, there were 110 respondents (43.3%).

The results of the univariate analysis of exclusive breastfeeding for toddlers can be seen in table 5 below.

**Table 5** Distribution of Exclusive Breastfeeding for Toddlers Aged 0-59 Months in the Working Area of the Nambo Health Center, Kendari City, 2023

Exclusive Breastfeeding	n	%
Yes	112	44.1
No	142	55.9
Total	254	100

Resource: Primary Data, April 2023

The table above shows that of the 254 respondents for the number of exclusive breastfeeding, the majority were not given exclusive breastfeeding, namely 142 respondents (55.9%), while yes, they were given exclusive breastfeeding, namely 112 respondents (44.1%).

### 3.2. Bivariate Analysis

The bivariate analysis in this study describes the analysis of the relationship between the independent variables and the dependent variable. By using the chi square test. The bivariate analysis obtained the following results:

**Table 6** The relationship between the independent variables and the dependent variable

No	Independent Variable	ARI Incident				Total		P value
		ISPA		No ISPA		n	%	
		n	%	n	%			
1.	Nutritional Status Malnutrition Good/Normal Nutrition	20 125	60.6 56.6	13 96	39.4 43.4	33 221	100 100	0.803
2.	Administration of vitamin A Complete No Complete	27 118	22.7 87.4	92 17	77.3 12.6	119 135	100 100	0.000
3.	Status Imunisasi Complete No Complete	46 99	41.8 68.8	64 45	58.2 31.2	110 144	100 100	0.000
4.	Exclusive Breastfeeding Yes No	51 94	45.5 66.2	61 48	54.5 33.8	112 142	100 100	0.001

Resource: Primary Data, April 2023

Based on table 6 the results of the analysis of the relationship between nutritional status and the incidence of ARI in toddlers, it was found that out of 33 respondents (100%) in the category of undernourished status, the proportion of infants experiencing ARI was 20 respondents (60.6%), while for the category of good nutritional status with a total of 221 respondents (100%), the proportion of children under five experiencing ISPA was 125 respondents (56.6%). Based on the results of data analysis using the chi-square statistical test, the p-value = 0.803 (> 0.05), that way Ho is accepted and Ha is rejected. This means that there is no relationship between nutritional status and the incidence of ARI in toddlers aged 0-59 months in the working area of the Nambo Health Center, Kendari City.

This research is in line with the results of research from Novia tri Wahyuningsih, 2021 at the Karang Mekar Public Health Center, Banjarmasin which shows that there is no relationship between nutritional status and the incidence of ARI in toddlers (p-value = 0.324). Nutritional status is important to know in every parent. The nutritional status of toddlers is very significant as a starting point for physical capacity when they reach adulthood. The factors that have the most influence on the nutritional status of toddlers can be studied to become recommendations that can be used as the best guidelines for the community.

Nutritional status greatly affects the health of toddlers where by getting good nutritional status, toddlers are not susceptible to disease, besides that toddlers are also susceptible to disease so by getting good nutritional status, the body has the ability to defend itself against ISPA disease attacks. If the nutritional state becomes less or worse, the body's immune response will decrease and self-defense resistance to infectious disease attacks will be weakened so that they are susceptible to acute respiratory infections (ARI) [9][10].

The results of the study at the Nambo Health Center showed that the proportion of toddlers with good nutritional status suffered from ISPA more than toddlers whose nutritional status was not good or lacking. Researchers assume this is caused by other factors that can cause ARI in infants, such as gender, immunization status, age, administration of vitamin A, and exclusive breastfeeding.

the results of the analysis of the relationship between the administration of vitamin A and the incidence of ARI in toddlers, it was found that out of 135 respondents in the incomplete category, the proportion of infants experiencing ARI was 118 respondents (87.4%), while for the complete category, a total of 119 respondents (100%) the proportion of children under five experiencing ISPA is as many as 27 respondents (22.7%). Based on the results of data analysis using the chi-square statistical test, the p-value = 0.000 (<0.05), that way Ho is rejected and Ha is accepted. This means that there is a relationship between the administration of vitamin A and the incidence of ARI in toddlers aged 0-59 months in the working area of the Nambo Health Center, Kendari City.

This research is in line with the results of research from Leonymayang, 2022 at the Betungan Health Center, Bengkulu City, which showed that there was a relationship between vitamin A consumption and the incidence of ARI in toddlers, which obtained a value (p-value = 0.000). Giving high-dose vitamin A supplementation twice a year to toddlers is very necessary to increase the toddler's body resistance to ARI.

The results of the study at the Nambo Health Center showed that the proportion of toddlers who were incomplete. Vitamin A supplementation suffered from ARI more than toddlers who were completely given vitamin A. resulting in acute respiratory infections (ARI) and there are still many respondents who are not concerned about seeking information which states that it is important to provide vitamin A for toddlers. In addition, ARI in toddlers is not only caused by giving vitamin A but also has other causative factors such as malnutrition status, incomplete immunization, the age of the toddler, and the intensity of contact with ISPA sufferers who are around the toddler such as parents, family, friends of the same age.

the results of the analysis of the relationship between Immunization Status and the incidence of ARI in toddlers, it was found that out of 144 respondents in the incomplete category, 99 respondents (68.8%) were in the incomplete category, while 110 respondents (100%) were in the complete category (100%) the proportion of children under five who had ARI was 46 respondents (41.8%) and 64 respondents (58.2%) did not have ARI. Based on the results of data analysis using the chi-square statistical test, the p-value = 0.000 (<0.05), that way Ho is rejected and Ha is accepted. This means that there is a relationship between Immunization Status and the incidence of ARI in toddlers aged 0-59 months in the working area of the Nambo Health Center, Kendari City.

This research is in line with the results of research from Rahayuningrum, 2021 in the city of Padang which shows that there is a significant relationship between immunization status and the incidence of ARI (p-value = 0.000). measles because mothers under five think that if their children are immunized they will experience measles and fever after being immunized so mothers do not bring their children to Posyandu[11].

The results of the study at the Nambo Health Center showed that the proportion of children under five who had incomplete immunization status suffered from ISPA more than those under five who had complete immunization status. Researchers assume this is due to the attitude and knowledge of mothers who do not know about the immunization schedule so that the time of immunization is late and they do not understand the importance of basic immunization for the immune system of toddlers, some respondents work as housewives but have other activities so they do not have time to immunize their toddlers, transportation costs, and some respondents thought not to bring their toddlers for immunization because they were afraid their toddlers would have a fever.

the results of the analysis of the relationship between exclusive breastfeeding and the incidence of ARI in toddlers, it was found that of the 142 respondents in the category of not being given exclusive breastfeeding, the proportion of toddlers experiencing ARI was 94 respondents (66.2%), while for the yes category, 112 respondents were given exclusive breastfeeding. (100%), the proportion of children under five who had ISPA was 51 respondents (45.5%). Based on the results of data analysis using the chi-square statistical test, it obtained a p-value = 0.001 (<0.05), that way

Ho was rejected and Ha was accepted. This means that there is a relationship between Immunization Status and the incidence of ARI in toddlers aged 0-59 months in the working area of the Nambo Health Center, Kendari City.

This research is in line with the results of research from Fitri apriyanti, 2022 in the Working Area of the Mining Health Center which shows that there is a significant relationship between exclusive breastfeeding and the incidence of ARI (p-value = 0.000). Exclusive breastfeeding in toddlers can prevent or be resistant to ARI (are less likely to be exposed to ARI), because in breast milk there are anti-bacterial substances that cause ARI and it is different from toddlers who are not given exclusive breastfeeding will lose the protective substances contained in breast milk so they are susceptible to ARI [12].

The results of the study at the Nambo Health Center showed that the proportion of children under five who were not exclusively breastfed suffered from ISPA more than children under the category yes, they were exclusively breastfed. Researchers assume this is because some respondents are unable to buy nutritious food during pregnancy so that at the time of delivery the milk production produced by respondents is lacking, some return to work after giving birth to meet family needs so that respondents do not have time to breastfeed, lack of husband and family support, some respondents making formula milk an alternative for breastfeeding respondents to replace breast milk whose delivery schedule varies, some are from birth, some are in the following months and there is a tradition of giving early MP-ASI to their babies such as bananas or steamed rice thereby reducing milk production respondent.

---

#### 4. Conclusion

Based on the results of research that has been done regarding relationship status nutrition, administration of vitamin A, immunization status and exclusive breastfeeding with incidence of ARI in toddlers aged 0-59 months in the Working Area of the Nambo Health Center Kendari City in 2023 can be summed up as follows:

- There is no relationship between nutritional status and the incidence of ARI in the region the work of the Nambo Health Center in Kendari City in 2023
- There is a relationship between vitamin A administration and the incidence of ARI in the region the work of the Nambo Health Center in Kendari City in 2023
- There is a relationship between the immunization status and the incidence of ARI in the region the work of the Nambo Health Center in Kendari City in 2023
- There is a relationship between exclusive breastfeeding and the incidence of ARI in the region the work of the Nambo Health Center in Kendari City in 2023

---

#### Compliance with ethical standards

##### *Acknowledgments*

The author would like to thank the Dean of the Faculty of Public Health, Halu Oleo University, who has provided support to the writing team so that this research can be carried out properly. Furthermore, the team of authors would like to thank all those who have helped until the end of this research.

##### *Disclosure of conflict of interest*

All authors in the making of this scientific article have no conflict of interest.

##### *Statement of informed consent*

All informants/respondents involved in this study have stated their consent as informants/respondents to be interviewed and provided information/information in accordance with research needs.

---

#### References

- [1] Irianto, K. (2014). *Epidemiology of Infectious and Non-communicable Diseases*. Alfabeta Cv.
- [2] Alemayehu M, D. (2014). Household Fuel Use and Acute Respiratory Infections in Children Under Five Years of Age in Gondar city of Ethiopia. *J Environ Earth Sci*, 4, 77–86.
- [3] WHO. (2019). Pneumonia. <https://www.who.int/news-room/fact-sheets/detail/pneumonia> (Accessed: 25 January 2023)

- [4] Ministry of Health, RI. (2018). Indonesia Health Profile 2017 (RI. Ministry of Health).
- [5] Southeast Sulawesi Health Office 2020. (n.d.). Southeast Sulawesi Health Profile 2020.
- [6] Widyawati, et al. (2020). Relationship between Nutritional Status and the Incidence Rate of Acute Respiratory Infection (ARI) in Toddlers Aged 1-5 Years in Surakarta. *Smart Medical Journal*, 3(2), 59.
- [7] Hidayatullah, L. M., Helmi, Y., & Aulia, H. (2016). Relationship Between Completeness of Basic Immunization and Frequency of Acute Respiratory Infection (ARI) in Toddlers Who Come to Sekip Palembang Health Center 2014 Acute Respiratory Infection or the Indonesian government, in this case, is the Dep. 3(3), 182–193.
- [8] Sari, A. I. (2019). The Relationship of Giving Vitamin A Capsules to the Incidence of ARI in Toddlers Who Have Been to the Simpang Baru Health Center in 2017. *Photon Journal*, 42–48.
- [9] Retnowati, M. (2019). The Relationship Between Nutritional Status of Toddlers and the Incidence of ARI (Acute Respiratory Infection) in Toddlers at the Karanglewas Health Center. *Viva Medika Journal of Health, Midwifery, and Nursing*, 12(1), 97–106.
- [10] Fitri apriyanti. (2022). Toddlers with Upper Respiratory Tract Infection (ARI) in Toddlers in Tarai Bangun Village. *Nurses Journal*, 6, 169–173.
- [11] Rahayuningrum, D. C., Nur, S. A., Tinggi, S., Health, I., & Scientists, S. (2021). Correlation between Nutrition Status and Immunization Status with Infection Incidence.
- [12] Fatimah, D. (2022). Relationship between Immunization Status and Acute Respiratory Infection (ARI) in Sick Toddlers (1-5 Years). *Journal of Health Phenomena*, 5(2), 101–105.