

## BREASTFEEDING WITH RECURRENT ACUTE RESPIRATORY TRACT INFECTIONS (ARI) IN TODDLER AT GOTONG ROYONG HOSPITAL SURABAYA

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### ABSTRACT

**Introduction:** Acute Respiratory Tract Infection (ARI) is a common illness in children under five years old. The incidence of ARI in developing countries is ten times more than in developed countries. There are many risk factors for ARI, such as breastfeeding.

**Aim:** The purpose of this study is to determine the relationship between exclusive breastfeeding with the occurrence of recurrent ARI in children under five.

**Method:** This research uses an analytic research design with an observational study type and a cross-sectional study method. The numbers of samples in this study were 203 samples and tested using the chi-square test. The data of 203 samples in this study were obtained from primary data with structured interviews regarding exclusive breastfeeding and secondary data by looking at the patient's medical records regarding the occurrence of recurrent ARI. From 203 selected samples, 47.3% are exclusively breastfed, and 52.7% are not exclusive breastfeeding. Recurrent ARI events were calculated over the past year with the criteria for ARI greater than or equal to six times.

**Result:** The results of this study are that 53.7% of samples do not have recurrent ARI, and 46.3% of samples have recurrent ARI. The results of this study show a p-value of 0.00, which means there is a significant relationship of exclusive breastfeeding with the occurrence of recurrent ARI in children under five years old.

**Conclusion:** The incidence of Recurrent ARI in children under five years old with exclusive breastfeeding history is lower than children under five years old without exclusive breastfeeding history.

**Keywords:** Exclusive breastfeeding, recurrent ARI

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## INTRODUCTION

Acute respiratory infection (ARI) is a disease that attacks one part and or more of the respiratory tract from the nose to the alveoli including adnexal tissue such as sinus, middle ear cavity, and pleura that lasts less than 14 days.<sup>1</sup>

ARI is the leading cause of infectious disease morbidity and mortality in the world. Mortality rates are very high in infants, children and the elderly, especially in countries with low and medium per capita income.<sup>2</sup> In 2013, the five provinces with the highest ARI prevalence period were East Nusa Tenggara (41.7% ), Papua (31.1%), Aceh (30.0%), West Nusa Tenggara (28.3%), and East Java (28.3%).

Patients with mild ARI can increase to severe if not treated properly, namely pneumonia. Pneumonia is the leading cause of mortality in children throughout the world. In 2013 an estimated 935,000 children under five years died of pneumonia. The highest incidence of toddler pneumonia is in the age group 12-23 months (21.7%).

Respiratory disease can be experienced several times by a child, so it is called recurrent ARI, and according to some available literature, to diagnose recurrent ARI is required at least one of the following criteria: i.e. experience  $\geq 6$  respiratory infections per year, have  $\geq 1$

respiratory infection per month involving the upper respiratory tract, or experiencing  $\geq 3$  respiratory infections per year involving the lower respiratory tract.<sup>5</sup>

According to the Indonesian Pediatrician Association, many factors underlie the course of ARI in children, one of which is breastfeeding.<sup>6</sup> Exclusive breastfeeding is given at least the first six months and continued breastfeeding accompanied by complementary feeding (MPASI). Breast milk will protect the baby against infection and also stimulate the healthy growth of the baby

According to the Surabaya City Health Office Profile, the coverage of babies receiving exclusive breastfeeding in Surabaya City in 2014 was 64.33% of the 18,901 babies examined.<sup>8</sup> In 2015, the coverage of babies receiving exclusive breastfeeding in the city of Surabaya was 64, 99% of 18,992 babies were examined. When compared with the previous year, the number of babies who received exclusive breastfeeding in 2015 increased by 0.66%.<sup>9</sup>

A research by Musfardi (2010) stated that there is a relationship between exclusive breastfeeding and the occurrence of ARI, where the results show that babies who are not exclusively breastfed are found more in the case group (ARI) than in the control group (not ARI), OR = 1.69 times (95% CI: 1.02-2.80). Research from

Abdullah (2003) also concluded that there was a significant relationship between breastfeeding for ARI events and  $OR = 5.63$  (95% CI: 3.03-10.41)<sup>10</sup>. Based on the data obtained and the results of several studies related, the researcher wants to know the relationship of exclusive breastfeeding with the occurrence of recurrent ARI.

## METHOD

This research uses an observational analytic research method with a cross-sectional approach because the data collection is only done once. This study aims to find the relationship between two variables that aim to determine the relationship of exclusive breastfeeding with the occurrence of recurrent ARI in Gotong Royong Hospital Surabaya. The independent variable in this study is exclusive breastfeeding. The dependent variable in this study is the occurrence of recurrent ARI.

The sample used in this study were all mothers with outpatient children aged 1-5 years who suffered from ARI in the Children's Clinic of Gotong Royong Hospital Surabaya in 2017 who met the inclusion and exclusion criteria. The calculation of sample size in this study uses a formula that is known to the number of populations in a place, then the number of samples obtained is equal to 200

samples. The sampling technique in the study used purposive sampling, namely sampling based on a particular consideration by the researchers themselves, based on the characteristics or characteristics of the population that had been known previously. The inclusion criteria in this study are as follows: Mothers with children aged 1-5 years who suffer from ARI, have come to the Children's Clinic of Gotong Royong Hospital as an outpatient for at least the last one year, mothers of children under five have the last education of at least junior high/senior high school, toddlers with ARI with middle family economic status (income per month > Rp. 3,000,000), toddlers with ARI who have a complete basic immunization history, and are willing to become research respondents by agreeing with informed consent. Exclusion criteria in this study were children suffering from infectious diseases other than ARI and other comorbidities, including suffering from diarrhea, DHF, typhoid, and patients who did not meet the inclusion criteria.

Retrieval of data on the history of exclusive breastfeeding is done by structured interviews with mothers of children under five, while data on the occurrence of recurrent ARI is done by referring to medical records for the past one year. This research was conducted at

Gotong Royong Hospital Surabaya in July 2017 to September 2017. In testing the hypothesis, researchers used statistical analysis techniques that were processed and presented with the help of the "Statistical Product and Service Solution" (SPSS) version 24. Chi-Square Test is used as a hypothesis test.

## RESULT

This research was conducted at the Children's Clinic of Gotong Royong Hospital Surabaya, located at Jalan Medokan Semampir Indah No. 97 Surabaya. This research was conducted on July 3, 2017 - September 9, 2017. The data used in this study are primary data and secondary data. Primary data is a history of exclusive breastfeeding taken through structured interviews, while secondary data is a history of recurrent ARI seen through the patient's medical record during the past year. The number of samples obtained was 253 samples, while the samples that met the inclusion criteria were 203 samples.

**Tabel 1** Gender Sample of ARI Patients at Children's Clinic of Gotong Royong Hospital Surabaya on July 3, 2017 - September 9, 2017

Gender	Frequency (n)	Percentage (%)
Male	105	51.7%
Female	98	48.3%
<b>Total</b>	<b>203</b>	<b>100%</b>

Table 1 shows that from 203 study samples, it was found that there were more male sex samples than female sex.

**Table 2** Age of ARI Patient Samples at Pediatric Clinic in Gotong Royong Hospital Surabaya on 3 July 2017 - 9 September 2017

Age	Frequency (n)	Percentage (%)
1 - < 3 y/o	107	52.7%
3 - 5 y/o	96	47.3%
<b>Total</b>	<b>203</b>	<b>100%</b>

Based on Table 2, it is known that the age of ARI patients who are classified as toddlers (1 - <3 years) more than the age of preschool (3-5 years).

**Table 3** History of Exclusive Breastfeeding Samples of ARI Patients in Pediatric Clinic of Gotong Royong Hospital Surabaya on 3 July 2017 - 9 September 2017

History of Breastfeeding	Frequency (n)	Percentage (%)
Exclusive	96	47.3%
Non-exclusive	107	52.7%
<b>Total</b>	<b>203</b>	<b>100%</b>

Based on Table 3, it is known that patients who did not receive exclusive breastfeeding were 107 samples while the number of patients receiving exclusive breastfeeding were 96 samples.

**Table 4** Occurrence of Recurrent ARI in Samples of ARI Patients in Pediatric Clinic of Gotong Royong Hospital Surabaya on 3 July 2017 - 9 September 2017

Occurrence of ARI	Frequency (n)	Percentage (%)
Non-recurring	109	53.7%
Recurring ARI	94	46.3%
<b>Total</b>	<b>203</b>	<b>100%</b>

Based on Table 4, it is known that the number of patients who did not experience recurrent ISPA was 109 samples (53.7%), more than the patients who experienced recurrent ISPA, namely 94 samples (46.3%).

**Table 5** Correlation analysis between the history of exclusive breastfeeding with the occurrence of recurrent ARI in the Gotong Royong Hospital Surabaya

History of Breast-feeding		ARI Occurrence				p Value
		Recurring ARI		Not Recurring ARI		
		n	%	n	%	
Exclusive		4	4.2	92	95.8	0.000
	Non-exclusive	90	84.1	17	15.9	
Total		94	46.3	109	53.7	

Table 5 is the result of the correlation analysis of the history of exclusive breastfeeding and recurrent ARI using the Chi-Square statistical test. From Table 5, it was found that the value of  $p =$

0,000 with  $OR = 121.7$  (95% CI: 39.4 - 375.9). So it can be concluded that there is a significant relationship between the history of exclusive breastfeeding and the occurrence of recurrent ARI events at Gotong Royong Hospital, Surabaya.

## DISCUSSION

The results of the study, according to demographic characteristics of descriptive data, were found to be prevalence in males of 105 respondents (51.7%) and females of 98 respondents (48.3%). This shows that the prevalence in men is more significant than in women.

This finding is supported by research from Anggia (2015), which found that a total of 44 patients out of the 80 patients studied (74.6%) diagnosed with ARI were male. Likewise, with research from Widarini (2010), which found that a total of 20 patients out of 36 control patients studied (55%) diagnosed with ARI were male.<sup>11,12</sup> Boys have higher activity compared to girls to play and interact with the outside environment so that the chance of exposure to germs that can cause disease is greater.<sup>13</sup>

The results of the study, according to the demographic characteristics of the descriptive data in this study, found that the prevalence of ARI at the age interval of 1-<3 years was 107 patients (52.7%) and at the age interval 3-5 years was 96

patients (47.3%). The data shows that the prevalence of ARI at the age interval of 1 - <3 years is higher than the age interval of 3 - 5 years.

This is in line with research from Anggia (2015), which found that 43 patients (76.8%) who experienced ISPA were aged 12-35 months.<sup>11</sup> In children under five, especially toddlers (1 - <3 years) are more prone to experience ARI because at that age the child's immune system is still weak or imperfect and toddler's respiratory organs have not reached perfect maturity, thereby increasing the child's risk of exposure to various diseases.<sup>13</sup>

The results of data analysis in this study used the variable exclusive breastfeeding and the variable occurrence of recurrent ARI using the chi-square test. The variable exclusive breastfeeding is divided into 2 categories, namely getting exclusive breastfeeding (6 months full ASI without any supplementary food) and not getting exclusive breastfeeding (not 6 months full breastfeeding), while the recurrent ARI variable is divided into 2 categories namely recurrent ARI (experiencing ARI  $\geq$  6 times in 1 year) and not ARI recurrent (experiencing ARI <6 times in 1 year).

Based on the results of the analysis with the chi-square test, it was found that the value of  $p = 0.00$ , while the  $\alpha$  value set

was 0.05, so the relationship was considered significant if the value of  $p < 0.05$ . Then it can be stated that there is a relationship between exclusive breastfeeding with ARI. The value of  $r$  obtained in this study amounted to 0.625; interpretation of the value of  $r$  when it was obtained  $r > 0.5 - 0.75$  was stated to have a strong correlation, so in this study, a strong correlation between exclusive breastfeeding and recurrent ARI was found. Therefore, it can be concluded that there is a significant relationship between exclusive breastfeeding and the occurrence of recurrent ARI in Gotong Royong Hospital Surabaya with a strong correlation, which means that if the child gets exclusive breastfeeding, the level of ARI in the child is low.

The results of this study are in line with research by Musfardi (2010) and Niken (2013) which states that there is a relationship between exclusive breastfeeding and the incidence of ARI<sup>10,14</sup> and supports the theory that inadequate breastfeeding is one of the risk factors that influence ARI in baby or child.<sup>6</sup>

Exclusive breastfeeding for six months has an excellent protective effect on the body against infection. The longer the breastmilk given, the higher the protective effect produced. Breast milk contains nutrients, antioxidants, hormones, and antibodies needed by children to grow

and develop and build the immune system. ASI contains the primary antibodies or immunoglobulins, namely IgA, IgE, and IgM, which are used to prevent and neutralize bacteria, viruses, fungi, and parasites. The highest amount of immunoglobulin is found in colostrum (milk that first exits until the fourth day), where the percentage of immunoglobulin will decrease over time.<sup>12,14</sup>

Total immunoglobulin in children will increase during periods of exclusive breastfeeding. This is what makes ASI as passive protection and influences the response of the child's immune system through various means, namely maturational, anti-inflammatory, immunomodulatory, and antimicrobial, where these are the immune effects that can be generated in the protection against ARI. A child's immune response is related to breastfeeding for four months, six months, or several years. Breast milk can also provide long-term protection through specific immune stimulation, where the immune system forms long-term memory against exposure to specific antigens. So that children who get exclusive breastfeeding are more resistant to infections one of which is ARI, compared to children who do not get breast milk.<sup>12,14</sup>

## CONCLUSION

Based on research conducted on the correlation of exclusive breastfeeding with the occurrence of recurrent ARI in children under five in Gotong Royong Hospital Surabaya in July 2017 until September 2017, the following conclusions can be drawn:

1. The incidence of recurrent ARI in children under five years at Pediatrician Clinic Outpatient at Gotong Royong Hospital Surabaya In July 2017 - September 9, 2017 is as much as 46.3%.
2. Patients of children under five who get a history of exclusive breastfeeding at the Outpatient Pediatrician Clinic at Gotong Royong Hospital Surabaya In July 2017 - 9 September 2017 is 47.3%
3. There is a significant relationship between exclusive breastfeeding with the occurrence of recurrent ARI with a p value of 0.00.

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