THE CORRELATION OF PHYSICAL OF A HOUSE TO THE ACUTE RESPIRATORY TRACT INFECTION (ARTI) CASES ON TODDLER AT NENDALI VILLAGE, EAST SENTANI DISTRICT

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ABSTRACT

Acute Respiratory Infection (ARI) is an acute infection involves the upper respiratory roomates tract organs and lower respiratory tract. Reviews These infections are the caused by viruses, fungi and bacteria. ISPA will attack the Hosts when the body's defenses (Immunology) Decreased. The purpose of this study is to Determine the correlation of physical of a house to the Acute Respiratory Tract Infection (ARTI) Cases on Infants at Nendali Village, East Sentani District. The study was A retrospective study with a case-control study approach, where the sampled population consists of a group of cases accounted for 36 samples and the control group and the 36 samples taken by purposive sampling. Data analysis uses the univariate and bivariate analyzes with chi-square and the amount of risk and odds ratios using multivariate analysis to find out the significance of correlation (p) of independent variables together with the dependent variables using logistic regression. The research results: 1) There is a correlation of the type of floor to the ARTI case (p = 0.018; OR = 3.538; 95% CI); 2) type of wall (p = 0.031; OR = 3.250; 95% CI); 3) Ceiling presence (p = 0.009; OR = 4.200; 95% CI); 4) bulkhead kitchen (p = 0.015; OR = 3.912 95% CI); and 5) The presence of smoke hole kitchen (p = 0.006; OR = 5.000; 95% CI). The results of multivariate analysis: 1) There is a correlation between presence and ARTI case ceiling OR = 0.31; 2) Bulkhead kitchen OR = 0.25. The infants living in the houses that do not have ceiling and bulkhead qualify presence kitchen qualify, have the risk of having ARTI as much as 28.8% greater than Reviews those living in the houses having ceilings and bulkheads kitchen in the house.

Keywords: Accute Respiratory Infection, Physical Home, Toddler

INTRODUCTION

Acute Respiratory Infection (ARI) is an acute infection which involves organs upper respiratory tract and lower respiratory tract. These infections are caused by viruses, fungi and bacteria. ISPA in *Bahasa* we said and ARI in *English* will attack the *host* when the body's defenses (immunology) decreases. Infants under five years are groups that have immune systems that are still susceptible to various diseases (Marhamah et al, 2012).

Based on the report by the World Health Organization (WHO) in 2010 declared the incident Acute Respiratory Infections (ARI) in developing countries with under-five mortality of 40 per 1,000 live births is 15% -20% per year at the age of five (WHO, 2010). In Indonesia, Acute Respiratory Infections (ARI) station is the first cause of death in infants and toddlers

group. This is indicated by ISPA are in the list of 10 diseases in Hospital. According to data RISKESDAS year 2007 - 2011 about 18 million people reported to have a prevalence of respiratory disease (MoH RI, 2013). Based on data from Jayapura District Health Office, ISPA figures in the last 3 years is still ranked first in the top 10 disease in Jayapura, ie in the year 2011 as many as 39 389 cases, as many as 41 541 cases in 2012, and by 2013 as many as 43 471 cases (district health office . Jayapura, 2013). According to data from 10 major diseases of Hope Health Center Jayapura District, ISPA ranked first in the year 2013 the number of cases of the disease by 3295. ARI prevalence by age group children in the year 2012 by 14.6% and in the year 2013 amounted to 17.6%. Based on data from PWS In 2013, Kampung Nendali had a prevalence of acute

respiratory infection in infants by 53.5%. This figure decreased when compared with the data of 2012 which had a prevalence of acute respiratory infection in infants by 63.7%, but not very significant.

In the region of the observation of Kampung Nendali early researchers of the 5 houses ISPA toddler patient data obtained that the condition of the homes of people in general does not meet the health requirements, which is characterized by the size of the house is less ventilation, natural lighting is less because less extensive window and most of the windows are closed (rarely open) so that light can not enter the sunlight, and the condition of the walls and floors of the house are made of wood and not well maintained which does not comply with the health requirements as well as some houses do not have insulation kitchen and kitchen smoke hole.

Based on the above problems, the authors wanted to do research with title Relationship physical condition of the house with the incidence of Acute Respiratory Infections (ARI) in Toddler in Nendali village, East Sentani Jayapura district. While the specific objectives of this study were: to analyze the relationship type of flooring, type of wall, ceiling existence, the existence of the bulkhead kitchen, where the smoke hole kitchen, lighting, ventilation, and humidity with the incidence of acute respiratory infection in infants.

SUBJECTS AND METHODS

This type of research is observational *retrospective study* using *case control* approach is to compare between groups of infants who suffer from respiratory disease (cases) with a group of other children who do not suffer from respiratory diseases *(controls),* then look for the factors causing the disease. Population of this research is all children under five who live in Kampung Nendali, sampling was done by *purposive sampling.*

Extensive measurements using a roll meter house ventilation, lighting measurement using a lux meter and moisture measurement using a hygrometer. While the characteristics of respondents, observation of the physical condition of the house which includes the type of flooring, type of wall, ceiling existence of the house, where the kitchen bulkhead, and the presence of smoke

hole home kitchen is done by filling out the *form* when the observation *check list.*

The data analysis research conducted univariate, bivariate, and multivariate. Bivariate data analysis was conducted to determine the relationship between the physical condition of the house with ARI in infants with *Chi Square test* and to determine the magnitude of the risk factors is done by calculating the odds ratio for each risk factor. While the multivariate analysis using logistic regression analysis to determine the relationship of risk factors together against ARI in infants.

Research Location

Location of research conducted in Kampung Nendali, Eastern District of Sentani Jayapura district. The research was conducted during one month, in September 2014.

Population

All children who reside and settle in the village of Nendali as many as 226 children.

Sample

Determination of the sample size was determined using the formula Lameshow (Lameshow, 1997):

Specification:

The sample in this study consists of two parts, namely case group and the control group, in which case the 36 respondent groups and the control group amounted to 36 respondents. Because this is a *case control study,* then the sampling is based on a comparison of the case group and the control group, ie 1:1, in order to obtain a sample 72 respondents. The sampling technique used *purposive sampling* technique:

Data Analysis

Data analysis was performed using several test analysis are as follows:

Univariate analysis

Univariate analyzes performed to get an overview of the distribution and frequency of variables *Dependent* and *Independent variables.* The data is presented in tabular form and implemented.

Bivariate Analysis

Table 4.9 Relationship Type Floor With Genesis ISPA /ARI

No.	Floor Type	Disease history ARI				Total	
		Case		Control			
		n	%	n	%	n	%
1.	TMS	24	66.7	13	36.1	37	51.4
2.	MS	12	33.3	23	63.9	35	48.6
Total		36	100	36	100	72	100

P-value: **0.018**;   *Odds Ratio (OR):* **3.538**;   **(95% CI): 1.340 to 9.343**
Source: Primary Data, 2014

Bivariate analysis was done to see the relationship between Independent variables Dependent variables, whether these variables had a significant relationship or a relationship just by chance by using a 2x2 table that Chi-square test and analysis interpretation p-value> 0.05, which means that the variable is not nothing to do and p-value <0.05, which means that the variable has to do, where to use the formula.

Multivariate Analysis

To analyze the risk factors associated with the incidence of acute respiratory infection in infants is jointly used multiple logistic regression test with α = 0.05. To see the dominant variable contribution to ARI in infants, formula used logistic regression prediction model according to Sabri and Hastono (2006), as follows:

(F0 - fe) 2 fe X2 image Σ=

f (Z)) = 1 + e (α + β1X1 + β2X2 + ... + βiαi) 1 When the Z value entered in the function of the function Z Z then the formula.

RESULTS

This research was conducted in the village Nendali Eastern District of Sentani Jayapura district with a sample of 72 children were divided into groups based on the case of 36 and 36. Age groups control most toddlers are 1 to 1.99 years as many as 20 (28%) infants, ie the lowest age group <1 year as many as nine (13%) infants. Bivariate analysis results can be seen in the following explanation :
Table 4.9 shows that of 36 cases with this type of floor does not qualify as many as 24 respondents (66.7%) and the type of flooring that qualify as many as 12 respondents (33.3%), while the 36 controls with the type of flooring that does not qualify as 13 respondents

(36.1%) and the type of flooring that qualify as many as 23 respondents (63.9%). Based on statistical analysis using chi-square test, p-value obtained for 0,018, where the p-value (0.018) is smaller than the specified significance level (α = 0.05) then H 0 is accepted. Thus statistically can be concluded that there is a relationship between the type of floor with ARI in infants.

The results are consistent with the results of research conducted by Pangestika, et al. Type floor of the house that have not yet installed in plaster or ceramic will be more humid conditions so that bacteria / viruses that cause respiratory infection will more multiply so that the risk of ISPA will be higher if the toddler often playing on the floor that is not in plaster / tile installed.

Table 4.10 Relationship Type Wall Home With Genesis ISPA/ARI

No.	Wall Type	Disease history ISPA				Total	
		Case		Control			
		n	%	n	%	n	%
1.	TMS	26	72.2	16	44.4	42	58.3
2.	MS	10	27.8	20	55.6	30	41.7
Total		36	100	36	100	72	100.0

P-value: **0.031** *Odds Ratio (OR):* **3.250; (95% CI): 1.217 to 8.676**
Source: Primary data, 2014

Table 4.10 shows that of 36 cases with this type of wall does not qualify as many as 26 respondents (72.2%) and the type of walls that qualify as many as 10 respondents (27.8%), while 36 controls the type of walls that do not qualify as 16 respondents (44.4%) and the type of walls that qualify as many as 20 respondents (55.6%).

Based on statistical analysis using chi-square test, p-value obtained 0,031, where the p-value (0.031) is smaller than the specified significance level (α = 0.05) then H 0 is accepted. Thus statistically can be concluded that there is a relationship between the type of wall with ARI in infants.

The results are consistent with the results of research conducted by Padmonobo. The house is not walled meeting as a board, wood and bamboo can cause respiratory diseases such as ARI sustainable, because the night wind directly into the house. Wall type affects the occurrence of respiratory infections, because the walls are difficult to clean will cause a buildup of dust, so it will serve as a good medium for breeding bacteria (Suryanto, 2003).

Table 4.11 Relationship Existence Ceiling With Genesis ISPA/ARI

No	The existence Ceilings	Disease History ISPA				Total	
		Case		Control			
		n	%	n	%	n	%
1.	TMS	27	75	15	41.7	42	58.3
2.	MS	9	25	21	58.3	30	41.7
Total		36	100	36	100	52	100

P-value: **0.009** *Odds Ratio (OR):* **4,200 (95% CI): 1.539 to 11.463**

Source: Primary Data, 2014

Table 4.11 shows that of the 36 cases with the presence of the ceiling does not qualify as many as 27 respondents (75%) and the existence of a ceiling which qualify as many as nine respondents (25%), while the presence of 36 controls with ceilings that do not meet requirements as much as 15 respondents (41.7%) and the presence of ceiling are eligible as many as 21 respondents (58.3%).

Based on statistical analysis using chi-square test, p-value obtained 0.009, where p-value (0.009) is smaller than the specified significance level (α = 0.05) then H 0 is accepted. Thus statistically can be concluded that there is a relationship between the presence of the ceiling with ARI in infants.

The results are consistent with research conducted by Sartika, et al. Roofs that do not have the ceiling that are open during the day will impact the distribution of dust particles more carried away by the wind into the room in the house.

Table 4.1 2 The existence of a relationship Insulation Kitchen Home With Genesis ISPA

No.	Bulkhead existence Kitchen	Disease history ISPA /ARI				Total	
		Case		Control			
		n	%	n	%	n	%
1.	TMS	30	83.3	18	50	45	62.5
2.	MS	6	16.7	18	50	27	37.5
Total			36	100	36	72	100

P-value: **0.015** *Odds Ratio (OR):* **3.912 (95% CI): 1.407 to 10.875**

Source : Primary Data, 2014

Table 4.12 shows that of the 36 cases with the presence of the kitchen bulkhead does not qualify as many as 30 respondents (83.3%) and the presence of a qualified kitchen bulkhead as much

as 6 respondents (25%), while the presence of 36 controls with kitchen bulkhead ineligible a total of 18 respondents (50%) and the presence of the kitchen bulkhead qualified a total of 18 respondents (50%).

Based on statistical analysis using chi-square test, p-value obtained for 0.015, where p-value (0.015) is smaller than the specified significance level (α = 0.05) then H 0 is accepted. Thus statistically can be concluded that there is a relationship between the presence of the kitchen bulkhead with ARI in infants.

The results are consistent with research conducted by Padmonobo, et al. Laying kitchen becomes one with the big house without separators can cause air pollution kitchen smoke spread into space the main house. When this condition occurs it will increase the risk of children suffering from ARI (Nurjazuli, 2009).

Table 4.13 Relationship Natural Lighting With History ISPA/ARI

No.	Bulkhead existence Kitchen	Disease history ISPA /ARI				Total	
		Case		Control			
		n	%	n	%	n	%
1.	TMS	30	83.3	18	50	45	62.5
2.	MS	6	16.7	18	50	27	37.5
Total			36	100	36	72	100

P-value: **0.015** *Odds Ratio (OR):* **3.912 (95% CI): 1.407 to 10.875**
Source: Primary Data, 2014

Table 4.13 shows that of the 36 cases with the presence of the kitchen smoke hole does not qualify as many as 24 respondents (66.7%) and the presence of the kitchen smoke hole that qualify as many as 12 respondents (33.3%), while 36 control with the presence of smoke hole a kitchen that does not qualify as many as 23 respondents (63.9%) and the presence of the kitchen smoke hole that qualify as many as 13 respondents (36.1%).

Based on statistical analysis using chi-square test, p-value obtained for 0,006, which the p-value (0.006) is smaller than the specified significance level (α = 0.05) then H 0 is accepted. Thus statistically can be concluded that there is a

relationship between the presence of the kitchen smoke hole with ARI in infants.

These results together with the results of research conducted by Pangestika. Combustion that occurs in the home kitchen is human activity that is a source of impurities or air pollution. Health effects will be visible when pollutant levels rise such that the disease arises. The influence of these chemicals will first be found on the respiratory system and skin and mucous membranes, and then if contaminants can enter the bloodstream, the systemic effects can not be avoided (Slamet, 2000).

Table 4.14 Relationship Natural Lighting With Genesis ISPA/ARI

No.	Natural lighting	Disease history ISPA /ARI				Total	
		Case		Control			
		n	%	n	%	n	%
1.	TMS	24	66.7	23	63.9	47	65.3
2.	MS	12	33.3	13	36.1	25	34.7
Total		36	100	36	100	72	100.0

P-value: **1.000** *Odds Ratio (OR):* **1.130; (95% CI): 0.428 to 2.985**

Source: Primary Data, 2014

Table 4:15 shows that of 36 cases with extensive ventilation does not qualify as many as 16 respondents (44.4%) and extensive ventilation qualify as many as 20 respondents (55.6%), while the 36 controls with extensive ventilation does not qualify as 21 respondents (58.3%) and extensive ventilation qualify as many as 15 respondents (41.7%).

Based on the analysis by using statistical chi-square test, p-value obtained for 0.346, where p-value (0.346) is greater than the specified level of significance ($\alpha = 0.05$) then H 0 is rejected. Thus statistically can be concluded that there is no relationship between ventilation with ARI in infants.

The results are consistent with the results of research conducted by Marhamah, et al. Based on indicators penghawaan house, extensive ventilation qualified health was more than equal to 10% of the floor area of the house and ventilation that do not meet health requirements are less than 10% of the floor area of the house (Dinata, 2007).

Table 4.15 Broad Ventilation Relations Home With Genesis ISPA/ARI

No.	Size Ventilation	Disease history ISPA/ARI				Total	
		Case		Control			
		n	%	n	%	n	%
1.	TMS	16	44.4	21	58.3	37	51.4
2.	MS	20	55.6	15	41.7	35	48.6
Total		36	100	36	100	72	100

P-value: **0.346** *Odds Ratio (OR):* **0.571; (95% CI): 0.225 to 1.453**

Table 4.16 shows that of 36 cases with humidity does not qualify as many as 29 respondents (80.6%) and the humidity is qualified by 7 respondents (19.4%), whereas the control with humidity of 36 who do not qualify as many as 24 respondents (66.7%) and humidity are eligible as many as 12 respondents (33.3%). Based on the analysis by using statistical *chi-square* test, *p-value* obtained for 0.285, where the *p-value* (0.285) is greater than the specified level of significance ($\alpha = 0.05$) then H 0 is rejected. Thus statistically can be concluded that there is no relationship between moisture with ARI in infants.

Table 4. 16 Relationship With Genesis ISPA Humidity Conditions

No	Humidity	Disease history ARI				Total	
		Case		Control			
		n	%	n	%	n	%
1.	TMS	29	80.6	24	66.7	53	73.6
2.	MS	7	19.4	12	33.3	19	26.4
Total		36	100	36	100	72	100.0

P-value: **0.285** *Odds Ratio (OR):* **2.071; (95% CI): 0.705 to 6.086**

Source: Primary Data, 2014

Results of this study are not consistent with the results of research conducted by Padmonobo, et al. Humidity is closely related to ventilation because the air circulation is not smooth will affect the temperature of the air inside the house to be low so that the air humidity is high. A house that has a high air humidity allow for rats, cockroaches and mold all of which have a major role in *the pathogenesis of* respiratory diseases (Krieger, 2002).

Table 4.17: Logistic Regression Analysis of Risk Factors Associated with Genesis ISPA 2014

No.	Variables	B	P-value	Exp.B	95% CI
1.	The existence of the ceiling	-1.169	0,030	0,311	0.108 to 0.894
2.	The existence of kitchen smoke hole	-1.350	0,020	0.259	0.083 to 0.811
	Constant	1,615	0,004		

Source : Primary Data, 2014

Based on the results of the multivariate analysis of the above. Risk factors that most influence on the incidence of acute respiratory infection in infants in Kampung Nendali East Sentani District District Jayaputa namely the existence of the ceiling (B = -1.169, *p value* = 0.030) and the presence of the kitchen smoke hole (B = -1.350, *p value* = 0,020)

The magnitude of the incidence of respiratory disease in infants due to the risk factors in the logistic regression equation is as follows :

$$P = 0.288\%$$

Based on the results of logistic regression analysis it was found that children who live in homes that have sky - the sky and the smoke hole kitchen is not eligible to have the risk of ISPA 28.8 is greater than in infants who lived in homes that have sky - the sky and the smoke hole kitchen qualify.

CONCLUSION

Based on bivariate analysis concluded that the type of floor of the house, the type of house walls, where the ceiling of the house, where the kitchen bulkhead, and the presence of the kitchen smoke hole, there is a significant relationship with the incidence of acute respiratory infection in infants.

There are two variables that become the dominant risk factors on the incidence of acute respiratory infection in young children, namely the existence of a ceiling and a kitchen where the smoke hole, the greater the risk (OR) each is 0,311; and 0.259. Probability under five suffer from acute respiratory infection when living at home who have ceiling holes are not eligible and ineligible kitchen smoke is 28.8%.

Inform health workers to conduct outreach to the community such as counseling about personal hygiene is very important to increase public knowledge and awareness of the requirements of a healthy home. With counseling can help people avoid the dangers of the disease. People expected when building a house so that the terms and conditions of a healthy home, improve hygienic behavior and healthy especially in conducting preventive measures on the incidence of respiratory disease and it is expected that the public can better prioritize their health so that health services can be put to good use.

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