Health, environment, current knowledge of the heads of household and acute respiratory infection in toddlers

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Abstract

Background: The ten patrons of disease at the Moni Health Center, the highest acute respiratory infection (ARI) of all cases, the second highest ARI in toddlers (62.90%) in Ende District. ARI can inhibit oxygenation of the body, causing decreased cell metabolism, thereby inhibiting growth and development, can contribute to morbidity and mortality in infants. Toddlers are still fully cared for by the family, which is the front line to prevent toddlers from getting sick.
Purpose: Determine the effect of knowledge and family home environment on the incidence of respiratory infections in toddlers.
Method: The research design is a mix of methods and approaches *cross sectional.* The sample size was calculated based on the Slovin formula of 164 respondents. Sampling using *purposive dan accidental sampling.* Data collected by interview, observation. The instrument used is the standard instrument. Bivariate Analysis *Who Square* to examine the effect of family tasks on the incidence of ARI. Logistic regression test to analyze the strength of the influence of knowledge and family home environment on the incidence of ARI at the 95% confidence level and significance limit p ≤0,05.
Results: Bivariate test increases the risk, namely family knowledge OR=1.950 (95% CI: 1.571-2.421; p=0.000), maintenance of the home environment, OR = 94.53 (95%) CI: 4.120 - 21.690 *p - value* = 0.000), In the multivariate analysis, it was found that the most dominant variable influencing increased risk was the maintenance of the home environment. There is a need for periodic health counseling and promotion related to efforts to prevent and control ARI, further research needs to use other methods.
Conclusion: The most dominant variable that influences increasing risk is the maintenance of the home environment. There is a need for periodic health counseling and promotion related to efforts to prevent and control respiratory infections, further research needs to use other methods.

Keyword: Acute Respiratory Infection; Heads of Household; Home Environment; Knowledge; Toddlers

INTRODUCTION

Children are the future of the nation, the next generation of families who need to be cared for with their health monitored so that they can grow and develop according to the child's age period. Government oversight efforts in preventing infectious diseases to reduce morbidity by immunization. But until now there are still many toddlers who experience infectious diseases in their infancy, one of which is respiratory infection.

Airway disease which is popularly known as acute respiratory infection (ARI) is a disease that often occurs in the community, it can also be said with the community, because they almost always experience acute respiratory infections when there is a change in weather, season, and even lack of sleep, especially in toddlers. This disease is very susceptible and mostly affects children under five years of age (toddlers). Some people consider this

disease normal because it can heal itself, by resting or by drinking enough. In this case, this disease is very high and contributes to morbidity and mortality in infants, due to the obstruction of oxygenation into the body, especially in infants who cannot cough effectively (Fillacano, 2013; Karo, 2020; Iskandar, Andersen, Bønnelykke, Ellermann, Andersen, & Bisgaard, 2012; Hadiana, & Ardiyanto, 2013; Sukarto, Ismanto, & Karundeng, 2016).

Research in Fortaleza, Northern Brazil entitled acute respiratory viral infections in outpatients found that the highest morbidity rate for respiratory tract diseases was in children under five years of age (toddlers) (de Arruda, Hayden, McAuliffe, Auxiliadora de Sousa, Mota, McAuliffe, & Gwaltney Jr, 1991). This is in line with incidents in Indonesia where ARI is the main cause of death in infants and children <5 years old (Ministry of Health of the Republic of Indonesia, 2018). The infant and child mortality rate in Europe is around 11%, Africa and Asia each at 20% and the majority (75%) of deaths are caused by pneumonia (Smith, Samet, Romieu, & Bruce, 2000; Widodo, 2013; Haptianingsih, & Romadhon, 2017). The highest death rate in East Nusa Tenggara is currently at highest death rate in East Nusa Tenggara. age group < 5 years 201 people (0.04%) and age 1-4 years 142 people (0.03%) (Ministry of Health of the Republic of Indonesia, 2018). The prevalence of ARI according to the diagnosis of health workers for Indonesia was 93% in 2018, while in East Nusa Tenggara (>40%) in 2013. This figure decreased in 2018 (15%), but the incidence of ARI in East Nusa Tenggara was ranked first. from all provinces in Indonesia. The characteristics of the population with the highest ARI were in the 1-4 year age group with 319,108 cases (66.75%) and those aged <1 year with 158,970 cases (33.25%) (Ministry of Health of the Republic of Indonesia, 2018). There are 24 Community Health Centers in Ende Regency where the highest ARI of the 10 disease patrons is 19 Community Health Centers (80%) with a prevalence of ARI in toddlers of 54% (East Nusa Tenggara Provincial Health Service, 2018).

The family is the front line for achieving health status, because health starts with family behavior. Families with good behavior can prevent the occurrence of a disease including ARI. Parents who have toddler with recurrent respiratory tract infections are found to be able to disrupt family routines and functions for a certain period of time (Van Der Gaag, & Van Droffelaar, 2012). Role in running family function, namely the function of family care which requires the family to provide food, clothing, protection and health or nursing care that is useful in preventing the incidence of ARI in infants (Roso, 2015; Isroyati, Suwitri, & Djati, 2015).

Based on a preliminary study at the Moni Health Center, it was found that the ARI morbidity rate throughout 2018 was 573 (62.90%) of the total visits of 911 people. Age 1 - 4 years 341 (37.43%) more souls than aged < 1 year totaling 232 (25.47%) souls. This ARI rate is the highest out of ten disease patrons at the Moni Health Center.

RESEARCH METHOD

This type of research is non-experimental, which is analytical descriptive research with a cross-sectional approach, namely research that studies the dynamics of correlation between factors and effects with dependent and independent variable data collection carried out at the same time. The design used is mixed methods. The population is all ARI diseases in the working area of the Moni Health Center in 2018 as many as 573 children under five. Data collection was carried out from September to October 2020. The sample size was calculated based on the Slovin formula of 164 respondents. Sampling used purposive and accidental sampling. The dependent variable in this research is the incidence of ARI in toddlers and the independent variable is the family assignment of toddlers with ARI. ARI incidents were seen from the frequency of recurrence and categorized into frequencies <6x /year and ≥6x /year.

Bivariate Chi-Square Analysis to test the effect of family duties on the incidence of ARI. Logistic regression test to analyze the strength of the influence of family duties on the incidence of ARI at a significance level of 95% and a significance limit of p ≤ 0.05. The questionnaire was filled out using a standard questionnaire about ARI from the University of Indonesia which was sorted and then arranged according to the needs of this research. Next, in-depth interviews and environmental observations were carried out to check the correctness of filling in the data through the questionnaire.

The principles of research ethics applied to this research are principles *confidentiality* and *anonymity.*

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The respondent's name uses initials and all information obtained is kept confidential. The information obtained is only used for research purposes. This research will request permission from the research ethics committee from the Kupang Health Ministry Polytechnic with no. LB.02.03/1/0087/2020.

RESEARCH RESULTS
Questionnaire

Table 1. Distribution of Respondents Characteristics (N=164)

Variable	Results
Toddlers Characteristics Age (Mean ± SD)(Range)(Month)	(36.57±7.928) (12-59)
Gender (n/%) Male Female	72/43.9 92/56.1
ARI Incident (n/%) <6x /Year ≥6x /Year	38/23.17 126/76.83
Respondents Characteristics Age (Mean ± SD)(Range)(Years)	(36.21±6.673) (21-47)
Education (n/%) Primary school Junior high school Senior high school College	9/5.5 53/32.3 100/61 2/1.2
Occupation (n/%) Farmer Self-employment	136/82.9 28/17.1

Based on table 1, it can be seen that the average age of toddlers is 36.57 months with a standard deviation of 7,928, the lowest age is 12 month and the highest age is 59 months, the majority are female at 56.1%, and the majority with a frequency of ARI incident ≥6x / year is 76.83 %.

The average respondents age is 36.21 years with a standard deviation of 6,673 and the age range is between 21 and 47 years, the majority have a senior high school education of 61% and 82.9% work as farmers.

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Table 2. Health, Environment, Current Knowledge of The Heads of Household and Acute Respiratory Infection in Toddlers (N=164)

Variable	Results	p-value	OR
Knowledge (n/%)		0.000	1.950 (1.571 – 2.421)
Good	86/52.44		
Poor	78/47.56		
Home Environment (n/%)			
Lighting in the house			
Good	126/76.83		
Poor	38/23.17		
Smoking habit inside home		0.000	40120 – 21.690
Yes	107/65.24		
No	57/34.76		
Heads of household habit, smoking while carry toddler			
Yes	70/42.68		
No	94/57.32		
Cleanliness inside home			
Good	101/61.59		
Poor	63/38.41		

In the table above, it is known that family knowledge about ARI is at the highest level of good knowledge, 52.44%, while the level of poor knowledge is 47.56%. The results of the Chi-Square test showed that the level of family knowledge regarding the incidence of ARI in toddlers was p-value = 0.000 (p<0.05).

In environmental maintenance, it shows that families do not maintain the home environment with smoking in the house 65.24%, carrying toddler while smoking, 42.68%, and a dusty home environment 61.59%, while the lighting in the house during the day is good 76.83% . Bivariate statistical test of family knowledge of maintaining the home environment on the incidence of ARI in toddlers p-value = 0.000 (p>0.05).

Interview

In-depth interviews were conducted to determine the validity of the questionnaire filled out about smoking habits in family members, in toddler who have ARI. The interview was conducted in person *accidental* on 5 families. An in-depth interview with the family as follows:
Their statement follows:

"Our father (husband) here smokes, mother, even if told, he won't listen, because he has been told by the Community Health Center, if you have small toddler, don't smoke (k.1)"

"Are you at home here?... yes, smoking... even if you are carrying your child and smoking, ma'am... if your child is still small, he will inhale cigarette smoke... isn't that good, mother? (k.2)"

"You only smoke, I don't, with my friend, mother...she said she couldn't refuse if it was offered but she doesn't smoke...he..he..he(k.3)"

"Almost all the men here smoke... including my husband. "We can get 1 pack a day, ma'am...it's hard for us...(k.4)"

"Yes, father here also smokes mother...inside the house too, not just outside the house, the toddler also smoke while smoking...(k.5)"

An in-depth interview with an Integrated Management of Sick Toddlers (ITC) to find out the time, condition or season, the highest incidence of

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ARI throughout the year and also the factors that influence ARI according to what the officer is studying. Here's the statement:

"ARi is always present in toddler, it's just that in certain seasons, for example the rainy or hot season, cases of ARI increase depending on the child's immune system."

"ARI services are still combined with general polyclinics, due to limited space"

"The factor influencing of ARI that we often ask about during the assessment is smoking, and in the majority of ARI cases, the average parent smokes."

"We are also studying ARI toddler who still sleep in the same room with their parents, and don't know the etiquette of coughing or sneezing so they easily spread to other people, that's why ARI cases... continue to be high..."

Observations or observations are used to observe the respondent's home environment as a factor influencing ARI. Done at the time of data collection on the houses that were the respondents in this study. The results of the observations are as follows:

Most families have bamboo houses with dirt floors, and only a few brick houses. The light conditions in the house are good, because even though the windows are not open, sunlight can penetrate through the bamboo gaps, but ventilation is lacking. The condition of the house is clean, but the floor is a bit dusty because it is not often wetted. Some of the families' yards are planted with vegetables and fruits, but some are left empty and barren, so that when the wind comes, dust flies.

DISCUSSION

The results of the study in table one show that families with good knowledge are 86 people (52.44%) and families with bad knowledge are 78 people (47.56%), sharing a room with a family member who has a respiratory infection 56.10%. The results of the bivariate test on the effect of family knowledge on the incidence of respiratory infections have p-*value* = 0.000, which means that there is an influence of family knowledge on the incidence of respiratory infections. These results are in accordance with previous research on the relationship between environmental factors and family behavioral factors with the incidence of ARI in toddlers at the Ambacang Community Health Center,

Kuranji District, Padang, where there is a relationship between knowledge and the incidence of ARI. respiratory infections with a value = 0.010 (Wahyuni, 2011).

Knowledge is the result of knowing after interaction by the human senses, this interaction occurs through media information whether print or electronic media. People who live in rural areas are far from any information. They do not know and understand that ARI is a contagious disease, so they feel that ARI is a mild and common illness because it is endemic in their area, moreover they think that ARI can heal on its own with adequate rest. This is evidenced by the following interviews:

"Coughs and colds are normal, ma'am, when the air is cold. He can recover on his own... When he was hot we took him to the Community Health Center to get medicine" (k.2).

The behavior of letting a child with an acute respiratory infection sleep with a family member who has an acute respiratory infection proves a complete lack of understanding that respiratory disease is a contagious disease. This community's behavior can be slowly changed by the consistency of health workers in providing counseling, about ARI being an infectious disease, using methods *peer review* for example for mothers of toddlers of the same age, so that information can be transmitted to other families quickly. The results of the logistic regression statistical test on the effect of knowledge on the incidence of respiratory infections with a 95% confidence level (C.I) obtained *p-value* 1,571 (*lower*) and 2,421 (*upper)*. These results show that the influence of knowledge is at least 1.571 times more likely to suffer from respiratory infections, and the greatest risk is 2.421 times to suffer from respiratory infections. Although the risk of knowledge about the occurrence of respiratory infections is small, according to WHO (2008) lack of knowledge in families can cause respiratory infections to occur in a pandemic. For this reason, mass prevention is necessary by using their own room for ARI sufferers, personal protective equipment, such as masks, washing hands frequently and observing the etiquette of coughing and sneezing using the upper arm to cover the nose and mouth because the transmission of the ARI virus is through sprinkling of nasal and mouth secretions.

The results showed that 65.24% of families did

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not protect the home environment by smoking in the house, 42.68% brought toddler while smoking, and 61.59% of the time the home environment was dusty, while 76.83% had good lighting in the house during that day. Bivariate statistical test of the effect of maintaining the family home environment on the incidence of ARI in toddlers p-value = 0.000 (p>0.05). These results are in accordance with research in Surabaya regarding the relationship between household physical conditions and the incidence of ARI in toddlers, that there is a relationship between smoking behavior (PR = 5.63; p value = 0.01) (Mahendra & Farapti, 2018). And research in Cambai Village, Prabumulih City shows that there is a relationship between house floors and dusty environments and the incidence of ARI with p = 0.001 (Oktaviani, Fajar, & Purba, 2010). Unhealthy home environmental conditions, namely cigarette smoke and dust pollution, can influence toddlers to suffer from ARI.

Cigarette smoke from parents is passive smoking for children under five. This causes the formation of nicotine tar on the mucous membranes of the respiratory tract and will cause the mucous membranes of the respiratory tract of children under five to swell and along with the entry of the influenza virus it will irritate the area, resulting in respiratory infections. This cannot be avoided if at that time the toddler's immune system is decreasing. Home environmental conditions with cigarette smoke and dust pollution pose a greater risk. Based on the results of the logistic regression statistical test regarding the influence of the home environment on the incidence of ARI with a confidence level of 95% (C.I), a p-value of 4.120 (bottom) and 21.690 (top) was obtained. These results show that the 4,120 people who were least affected by environmental pollution had twice the risk of suffering from ARI, and had the greatest risk of suffering from ARI, namely 21,690 times. In line with previous research which states that smoking behavior among people closest to them is related to the incidence of respiratory tract infections in toddlers (Siregar, Banowo, & Sarfika, 2018; Kurniawan, Wahyudi, & Zainaro, 2021; Nur, Syamsul, & Imun, 2021). Smoking behavior is very difficult to overcome. Health workers should have the courage to provide panism in educating the head of the family (father) who smokes with regular counseling, to reduce smoking activities. At least

change their mindset by not smoking at home, let alone smoking while carrying toddler, as complained in interviews.

The same statement was conveyed by the Integrated Child Disease Management officer: "The factor that influences ARI that we often ask about during assessments is smoking, and in most cases of ARI, the average parent smokes." I still sleep in the same room as my parents who have an acute respiratory infection, and don't know the etiquette when coughing or sneezing, so it can be easily transmitted to other people, that's why this case of respiratory infections... keeps getting high..."

CONCLUSION

The most dominant influence on the incidence of respiratory infections in this study was the home environment with cigarette smoke and dust pollution.

SUGGESTION

For health workers to provide method counseling *peer group* and counseling to change knowledge and home environment related to family smoking behavior.

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