

Factors Related to Incidence of ARI in Toddlers in the Working Area of the Kolang Health Center, Kolang District, Central Tapanuli Regency

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ABSTRACT

The incidence of ARI always ranks first as the cause of death in infants and toddlers. ARI is the cause of morbidity and mortality of infectious diseases in the world. One of the developing countries with ARI cases is Indonesia, and the number is increasing every year. In addition, ARI is also often on the list of the 10 most common diseases in hospitals and health centers. Data obtained from the Kolang Health Center shows that the incidence of ARI has increased over the last three years. In 2020, 622 cases were found, including those of all ages, from toddlers, children, adults to the elderly. This study aims to determine the factors associated with the incidence of ARI in toddlers in the working area of the Kolang Health Center, Kolang District, Central Tapanuli Regency in 2021. This study is an analytical study with a cross-sectional study design. The population of this study all patients who visited/received treatment at the Kolang Health Center totaled 345 people, and a sample of 75 people was taken using the sampling technique simple random sampling. The data collection method was carried out using a questionnaire, and the data analyst used Chi Square. The results of the study showed there is relationship between nutritional status and the incidence of ARI, there is no relationship between smoking habits and the incidence of ARI, and there is a relationship between the habit of opening windows and the incidence of ARI. The conclusion of this study is that nutritional status, the habit of opening windows are significantly related to the incidence of ARI and the habit of smoking in the house has no significant relationship with the incidence of ARI. For this reason, it is recommended that mothers pay attention to toddler nutrition, come as much as possible if there is a nutritional status counseling schedule and it is hoped that families open windows every day so that ARI in toddlers does not occur or can be prevented.

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INTRODUCTION

According to Riskesdas (2018), acute respiratory infection (ARI) is still a public health problem. This problem is important to pay attention to because ARI is an acute disease that can cause death for people in various developing countries, including Indonesia. ISPA is the cause of morbidity and mortality of infectious diseases in the world. The mortality rate of ISPA is 4.25 million each year in the world. The group most at risk is toddlers. Around 20-40% of hospital patients are children due to ISPA with around 1.6 million deaths due to pneumonia alone in toddlers per year. In adults, the mortality rate, in adults (25-59) reaches 1.65 million (Najmah, 2016).

According to (WHO, 2016) ARI cases worldwide are 18.8 billion and deaths are 4 million people per year. The ARI mortality rate is very high in toddlers, adults and the elderly, especially in countries with low and middle per capita income. One of the developing countries with ARI cases is Indonesia. Indonesia has a mortality rate caused by ARI covering 20% -30% of all child deaths. The incidence of ARI is still a major health problem in Indonesia. The prevalence of ARI in Indonesia

in 2018 was 9.3%. This disease is still a frequent patient visit to the Health Center (Ministry of Health of the Republic of Indonesia, 2018).

The provinces with the highest ISPA in Indonesia are East Nusa Tenggara (16.7%), Papua (14.0%), Aceh (12.0%), West Nusa Tenggara (11.9%), East Java (9.5%) and the fewest ISPA sufferers are in Jambi at 5.5. The prevalence period (number of sufferers in a certain period of time) of ISPA in Indonesia is 9.3%. (Ministry of Health of the Republic of Indonesia, 2018).

Data obtained from the Health Office of Central Tapanuli Regency, ISPA disease was the first disease in 2018 with 19,351 cases out of the 10 largest diseases. Based on data recording obtained from the Kolang Health Center, Central Tapanuli Regency on February 19, 2021, ISPA disease was in the 10 largest diseases for the past three years. In 2018, ISPA disease was found in 163 cases, in 2019 there were 313 cases and in 2020 there were 622 cases, including those occurring in all ages from toddlers, children, adults to the elderly.

In general, there are 3 factors that cause ARI, namely environmental factors, individual child factors, and behavioral factors. Individual child factors are nutritional status, while behavioral factors that can cause the risk of ARI are behavioral factors such as smoking habits in the house and lack of habits to open house windows. Handling ARI in the family, whether carried out by the mother or family members, is very important for the prevention and control of ARI in the family. (Ministry of Health of the Republic of Indonesia, 2016).

Individual factors of children, namely nutritional status, have poor nutritional status, tend to suffer from infectious diseases due to nutritional intake that affects the body's immune system. Behavioral factors can be caused by indoor air pollution such as cigarette smoke and the behavior of a lack of habit of opening house windows. The habit of the head of the family smoking inside the house can have a negative impact on family members, especially toddlers. A house with windows that are rarely opened causes air exchange to not take place perfectly and there is less sunlight in the house, so that cigarette smoke collects in the room and sticks to various places, so that the occupants who live in it are more susceptible to ARI (Irawan, 2015).

Based on research by Almira, Fahdi, & Budiharto, (2017), there is a relationship between nutritional status and ISPA. Nutritional status affects the body's resistance, where the lower the nutritional status of a toddler, the lower the toddler's resistance, so the toddler is more susceptible to infection.

In a study conducted by Asih (2015) it was stated that cigarette exposure significantly affects the incidence of ARI. The study proved that toddlers exposed to cigarette smoke were at 11.9 times greater risk of ARI compared to toddlers who were not exposed to cigarette smoke. Based on research by Widyaningtyas (2015) in Kebumen Regency, it was stated that respondents with the habit of not opening windows every day could increase the risk of toddlers getting ARI 5.28 times compared to respondents who had the habit of opening windows every day.

Based on initial observations that have been conducted in the Kolang Health Center working area in 10 respondent houses where there are 8 respondents who have ARI or have a history of ARI, 2 houses were found to have poor nutritional status, and 6 houses had poor behavior such as 3 houses have a habit of smoking in the house by the head of the family and 3 houses have a lack of habit of opening windows in the morning until the evening. The morning sun has difficulty entering the room so that the exchange of fresh air and dirty air cannot take place properly. This condition results in poor air quality, so that it can be a source of risk of disease transmission, one of which is ARI. The purpose of this study was carried out To determine the relationship between nutritional status and the incidence of ARI in the working area of the Kolang Kolang Health Center, Kolang District, Central Tapanuli Regency in 2021. To determine the relationship between smoking habits in the home and the incidence of ARI in the working area of the Kolang Kolang Health Center, Kolang District, Central Tapanuli Regency in 2021. To determine the relationship between the habit

of opening house windows and the incidence of ARI in the working area of the Kolang Kolang Health Center, Kolang District, Central Tapanuli Regency in 2021.

METHOD

This type of research is quantitative using an analytical survey approach with a cross-sectional design, namely to determine the factors related to the occurrence of ARI. The population in this study were all patients who visited/received treatment at the Kolang Health Center, Kolang District, Central Tapanuli Regency per month, totaling 345 people. The sample was part of the large sample population of 75 people.. The sampling technique uses simple random sampling, namely sampling which is done randomly to represent the population.

Data collection methods using primary data and secondary data: primary data is data obtained from direct observation results in the form of observation and interviews or data collection sheets used to determine nutritional status and smoking habits in the house and the habit of opening windows. Secondary data is called second-hand data. Secondary data in this study were obtained from the Health Office of Central Tapanuli Regency and the Kolang Health Center, Kolang District, Central Tapanuli Regency through reports or documents from medical records. Or data obtained from library research, namely through books, references to scientific journals that are theoretically useful and related to research problems. Data processing is carried out by the Editing, Coding, Entry, Cleaning and Tabulating processes.

Data analysis

a. Univariate Analysis

Univariate analysis was used to determine the frequency distribution of nutritional status, smoking habits, window opening habits, and ARI incidence.

b. Bivariate Analysis

Bivariate analysis was conducted to determine whether there was a relationship between nutritional status, smoking habits in the house and the habit of opening bedroom windows with the incidence of ARI. After being processed, the data were analyzed using the Chi Square statistical test with a 95% confidence level at a value of $(\alpha) = 0.05$. Data processing will be carried out using a computer.

RESULTS AND DISCUSSION

Univariate Analysis

Toddler Age

Based on interviews using data collection sheets on respondents, a description of the age of toddlers can be seen in the following table:

Table 1 Frequency Distribution and Percentage of Toddler Age in the Kolang Health Center Working Area in 2021

No	Toddler Age	n	%
1	<1 Year	23	30.0
2	2-3 Years	33	44.0
3	4-5 Years	19	25.0
	Total	75	100

Based on the table above, it shows that the majority of toddlers are aged 2-3 years, namely 44%, and the fewest are in the 4-5 year age category, namely 25%.

Mother's Education

Based on interviews using sheets data collection on respondents, the educational picture can be seen in the following table:

Table 2 Frequency Distribution and Percentage of Maternal Education in the Kolang Health Center Work Area in 2021

No	Education	n	%
1	SD	18	24.0
2	JUNIOR HIGH SCHOOL	12	16.0
3	High School Equivalent	39	52.0
4	Diploma/Bachelor	6	8.0
	Total	75	100

Based on the table above, it shows that the majority of education is high school or equivalent, namely 52% and the least is Diploma/Bachelor's education, namely 8.0%.

Mother's Job

Based on interviews using data collection sheets on respondents, a description of the work can be seen in the following table:

Table 3 Frequency Distribution and Percentage of Mother's Employment in the Kolang Health Center Work Area in 2021

No	Work	n	%
1	Housewife	16	21.0
2	Farmer	40	53.0
3	Honorary	6	8.0
4	Self-employed	13	17.0
	Total	185	100

Based on the table above, it shows that the majority of farmers work, namely 53%, and the least are in the honorary job category, namely 8%.

Univariate Data Analysis

Toddler Nutritional Status

Based on interviews using data collection sheets on respondents, nutritional status can be seen in the following table:

Table 4 Frequency Distribution and Percentage of Toddler Nutritional Status in the Kolang Health Center Work Area in 2021

No	Nutritional status	n	%
1	Malnutrition	43	57.0
2	Good nutrition	32	42.0
	Total	75	100

Based on the table above, it shows that the nutritional status of the majority is poor nutritional status, namely 57%, and the least is in the good nutritional status category, namely 42%.

Smoking Habit Inside the House

Based on interviews using data collection sheets on respondents, smoking habits can be seen in the following table:

Table 5 Frequency Distribution and Percentage of Smoking Habits in Houses in the Kolang Health Center Working Area in 2021

No	Smoking Habit	n	%
1	There is	62	83.0
2	There isn't any	13	17.0
	Total	75	100

Based on the table above, it shows that the majority of smoking habits are in the existing category, namely 83%, and the least are in the non-existent category, namely 17%.

Habit of Opening Windows

Based on interviews using data collection sheets on respondents, the habit of opening windows can be seen in the following table:

Table 6 Frequency Distribution and Percentage of Window Opening Habits in the Kolang Health Center Work Area in 2021

No	Habit of opening windows	n	%
1	Not opened	39	52.0
2	Opened	36	48.0
	Total	75	100

Based on the table above shows that the habit of opening windows is mostly not opened at 52% and the least is in the category, namely 48%.

Occurrence of ISPA in Toddlers

Based on interviews using data collection sheets on respondents, the incidence of ARI in toddlers can be seen in the following table:

Table 7 Frequency Distribution and Percentage of ISPA Incidents in Toddlers in Kolang Health Center Working Area in 2021

No	ISPA incident	n	%
1	ISPA occurs	58	77.0
2	No ARI occurred	17	23.0
	Total	75	100

Based on the table above, it shows that the majority of ISPA incidents in toddlers occurred in ISPA, namely 77.0%, and the least was in the category of no ISPA, namely 23%.

Bivariate Data Analysis

The relationship between nutritional status and the incidence of ARI in toddlers in the Kolang Health Center work area in 2021

The results of the cross-tabulation between nutritional status and the incidence of ARI in toddlers can be seen in the following table:

Table 8 Cross Tabulation of the Relationship between Nutritional Status and the Incidence of ISPA in Toddlers in the Kolang Health Center Work Area in 2021

Nutritional status	ISPA incident				Total		p Value
	ISPA occurs		No ARI Occurred		n	%	
	n	%	n	%			
Malnutrition	31	72.1	12	27.9	43	57.0	0.000
Good Nutrition	27	68.4	5	15.6	32	42.0	
Total	58	77.3	17	22.7	75	100	

Based on the table above, data shows that out of 57% of toddlers with malnutrition, 72.1% had ARI and 27.9% did not have ARI, while out of 42% of toddlers with good nutrition, 68.4% had ARI and 15.6% did not have ARI. Based on the results of the statistical test, the p-value is 0.000, meaning that there is a relationship between nutritional status and the incidence of ARI in toddlers in the Kolang Health Center area in 2021.

The relationship between smoking habits and the incidence of ARI in toddlers in the Kolang Health Center work area in 2021

The results of the cross-tabulation between smoking habits and the incidence of ARI in toddlers can be seen in the following table:

Table 9 Cross Tabulation of the Relationship between Smoking Habits and the Incidence of ARI in Toddlers in the Kolang Health Center Work Area in 2021

Smoking Habit Inside the House	ISPA incident				Total		p Value
	ISPA occurs		No ARI Occurred		n	%	
	n	%	n	%			
There is	47	75.8	15	24.2	62	82.7	0.389
There isn't any	11	19.6	2	15.4	13	17.3	
Total	58	77.3	17	27.7	185	100	

Based on the table above, it can be obtained data that out of 82.7% who smoke, 75.8% have ARI, 24.2% have no ARI, while out of 17.3% who do not smoke, 19.6% have ARI and 15.3% have no ARI. Based on the results of the statistical test, the p-value is 0.389, meaning that there is no relationship between smoking habits and the incidence of ARI in toddlers in the Kolang Health Center area in 2021.

The relationship between the habit of opening windows and the incidence of ARI in toddlers in the Kolang Health Center work area in 2021

The results of the cross-tabulation between the habit of opening windows and the incidence of ARI in toddlers can be seen in the following table:

Table 10 Cross Tabulation of the Relationship between the Habit of Opening Windows and the Incidence of ARI in Toddlers in the Work Area of the Kolang Health Center in 2021

Habit of Opening Windows	ISPA incident				Total		p Value
	ISPA occurs		No ARI Occurred		n	%	
	n	%	n	%			
Not opened	33	84.6	6	15.4	39	52.0	0.001
Opened	25	69.4	11	30.6	36	48.0	
Total	58	77.3	17	22.7	75	100	

Based on the table above, it can be obtained data that from 52% of unopened windows, 84.1% experienced ARI, 15.4% did not experience ARI, while from 48% of opened windows, 69.4% experienced ARI and 30.6% did not experience ARI. Based on the results of the statistical test, the p-value of 0.001 means that there is a relationship between the habit of opening windows and the incidence of ARI in toddlers in the Kolang Health Center area in 2021.

Discussion

Relationship between Nutritional Status and the Incidence of ISPA in Toddlers

The results of the study on the nutritional status of toddlers showed that the majority of them were undernourished, namely 57%. This result was known from the results of anthropometric measurements using the toddler KMS card. According to (A. Berry, 2017) that malnutrition is when the Z-score value is $-3SD$ to $<-2SD$, from the results of the study the majority of toddlers experience malnutrition. This is because the majority of mothers' education is high school/equivalent, namely 52% so that knowledge about providing good nutritional status for toddlers is lacking. Based on the work of the majority of toddler mothers as farmers, namely 53%, in the morning the toddler's mother has to go to the fields and come home in the evening so that the mother's time to take care of toddlers at home is reduced such as feeding toddlers, arranging toddler rest hours, and supervising toddlers when playing at home so as not to put dirty objects or food into the toddler's mouth.

The majority of toddlers are aged 2-3 years, namely 44%. At this age, toddlers must get sufficient nutrition for their growth and immunity so that they do not...easily infected by viruses or bacteria that cause diseases that can inhibit toddler growth. At the age of toddlers, mothers really need more time to pay attention to the condition of toddlers. Health workers in the Kolang Health Center work area always conduct integrated health posts and counseling on the nutritional status of

toddlers at the beginning of each month. Meanwhile, many mothers of toddlers do not accompany their toddlers to the integrated health posts because they are busy working and leave their toddlers with village cadres or other family members. The results of the cross-tabulation of toddlers with poor nutritional status experienced ARI of 72.1% and toddlers with good nutritional status experienced ARI of 68.4%.

Malnutrition and ARI are caused by the mother's education and work, so that the majority of mothers have a high school education/Equally have less knowledge and the majority of mothers work as farmers. Mothers who work as farmers are busy spending their days in the fields so that the mother's time for toddlers is reduced to pay attention to the growth of toddlers so that toddlers have poor nutrition and toddlers who have poor nutrition have weak immunity and are susceptible to infection by infectious diseases such as ARI.

This result is in line with the theory that one of the risk factors that can affect the occurrence of ARI in children is the nutritional status factor. Children under the age of five are an age group that is vulnerable to nutritional disorders and susceptible to disease and it has long been known that there is a synergistic interaction between malnutrition and infection. Nutrition is a determinant of the quality of human resources. Nutritional disorders will reduce cellular immunity, the thymus gland and tonsils become atrophic and the number of T-lymphocytes decreases, so that the body will become more susceptible to disease or infection.

Good nutritional status has better immunity compared to toddlers who have poor nutrition because toddlers with good nutrition get adequate intake of substances that are useful for physical growth, brain development and immunity. It is very necessary because it can avoid diseases such as ARI. Nutritional Status is a condition caused by the balance between nutrient intake from food and nutrient needs required for body metabolism. Each individual requires different nutrient intake between individuals, this depends on the person's age, gender, daily body activity and body weight. (Par'i, 2017)

The results of the study in the Kolang Health Center work area showed that toddlers with good nutrition also contracted ARI, this is because the incidence of ARI can be influenced by several other extrinsic and intrinsic factors such as age, breastfeeding, pollution, socioeconomic status, LBW, and others. Toddlers are at risk of contracting ARI even with good nutritional status, this is due to environmental factors where the virus is transmitted due to family members who have initially contracted ARI or dust and smoke due to cigarette smoke inhaled by their parents.

Based on the results of statistical tests, it shows that the value $P\text{-Value} 0.000 < 0.05$, then in this case accept H_0 . This shows that there is a significant relationship between Toddler Nutritional Status and the Incidence of ARI in Toddlers in the Kolang Health Center area in 2021. It can be concluded that toddlers who have less nutrition are more at risk of ARI compared to toddlers who have good nutrition.

This research is in line with research Febrianto et al., (2015) entitled Nutritional status is related to the incidence of ARI in toddlers in the Wonosari I Community Health Center Working Area, Gunung Kidul Regency 2015, the results of the chi-square analysis showed a relationship between nutritional status and the incidence of ARI ($r = 22.241$, $p = 0.000$).

The Relationship Between Smoking Habits and the Incidence of ARI in Toddlers

The results of the study showed that the majority of smoking habits were 75%, these results were found through direct interviews with respondents. The results of the study showed that there was a habit of smoking in the house. This is because family members usually smoke in the house when relaxing, for example while watching TV. Based on the majority of mothers' education, which is high school/equivalent, which is 52%, this education can affect a person's level of knowledge in adopting a clean and healthy lifestyle and attitude in utilizing health services around them. A high level of education will make it easier for someone to absorb information and implement it in their

daily behavior and lifestyle, especially those related to health and work. The majority of mothers of toddlers work outside the home so that the experience of mothers of toddlers is broader than mothers of toddlers who do not work, such as housewives who are only at home every day and have less extensive security.

The results of the cross-tabulation of toddler families who have smoking habits with the occurrence of ARI were 75.8% and families who did not smoke with the occurrence of ARI were 19.6%. In general, there are 3 (three) risk factors for ARI, namely environmental factors, individual factors, and behavioral factors. Environmental factors include indoor air pollution (cigarette smoke), home ventilation. Individual factors such as nutritional needs, birth weight, and immunization status. (Mpangulu, SA, 2016)

According to researchers, there is no relationship between smoking habits of family members and the incidence of ARI in toddlers in the Kera Puskesmas Kolang area. This is because children are kept away when there are family members who smoke and the factors that cause ARI are not only smoking habits but there are also other factors such as smoke from burning garbage, house ventilation and others or it could also be caused by individual factors such as nutritional status, immunization status, or behavioral factors, for example, people who cough close to toddlers do not cover their mouths so that the droplets enter the toddler's respiratory system and cause the toddler to become infected.

The results of the study in the Kolang Health Center work area showed that toddlers who did not have families with smoking habits in the house also had ISPA. This was caused by... Apart from the habit of smoking in the house, there are also several factors that can cause ARI, including the condition of the house, nutritional status and others. The results of the statistical test show that the p-value is $0.389 > 0.05$, so in this case H_0 is rejected. This shows that there is no significant relationship between smoking habits and the incidence of ARI in toddlers at the Kolang Health Center in 2021. It can be concluded that the occurrence of ARI in toddlers in the Kolang Health Center work area is not due to smoking habits in the home but there are other factors such as nutritional status, LBW, home ventilation and others.

This result is in line with research (Fillacano, 2019) entitled The relationship between the home environment and ISPA in toddlers in Ciputat sub-district, Tangerang City in 2013, it was found that the results of statistical tests showed that there was no relationship between the smoking habits of household occupants and ISPA in toddlers in Ciputat sub-district with a p-value of 0.409.

The Relationship Between the Habit of Opening Windows and the Incidence of ARI in Toddlers

The results of the study showed that the majority of people who open windows are not opened, namely 84%. This result was found through interviews and direct observation at the respondent's home. From the results of the study, the windows were not opened every morning until the evening. This is caused by The majority of mothers of toddlers work as farmers, namely 53% which causes mothers who spend time outside the home, such as mothers who work as farmers, to go to the fields in the morning and come home in the evening without having time to open the window,

Based on The majority of mothers' education is high school/equivalent, namely 52%, which can influence a person's level of knowledge in adopting a healthy lifestyle, so that There are mothers who think they don't want to open the windows of their house because they are afraid of theft because their windows don't have security, and there are also mothers of toddlers who think they don't want to open the windows because they are afraid of getting dirty from dust coming in from outside the house. Based on the age of toddlers, the majority are 2-3 years old, namely 44% of toddlers of this age are susceptible to infection with infectious diseases. The results of the cross-tabulation of the habit of opening windows with the occurrence of ISPA, namely 84.6% and families who have the habit of opening windows when there is an ISPA incident, namely 69.4%.

These results are in line with the theory that bedroom windows and poor lighting in unhealthy homes can increase the risk of ARI in toddlers. In order to avoid the transmission of disease and accidents in the home, a healthy home must be built in such a way that it can protect occupants from possible danger or accidents and transmission of disease. Bedroom windows are very important for air circulation, with the presence of windows as air vents, the room is not stuffy and can avoid the transmission of ARI caused by viruses and bacteria.

The results of the study in the working area of the Kolang Health Center, toddlers who have the habit of opening windows also experience ISPA, explaining that ISPA is a complex and heterogeneous disease caused by various causes and can affect any place along the respiratory tract. ISPA that occurs in toddlers can be caused by respondents not maintaining environmental cleanliness. An environment with bad air such as air pollution, Cigarette smoke and dirty floors can trigger the onset of ARI in toddlers. The habit of opening windows is important to get enough light in the morning until the afternoon. The light is useful for killing pathogenic bacteria in the house. The habit of not opening windows makes the air not flow freely so that the room becomes humid. Humid room conditions cause bacterial growth (Zuriya Yufa, 2016)

The results of the statistical test show that the P-Value is $0.001 < 0.05$, so in this case accept H_0 . This shows that there is a significant relationship between the habit of opening windows and the incidence of ARI in toddlers at the Kolang Health Center in 2021. It can be concluded that the occurrence of ARI in toddlers in the Kolang Health Center work area is one of the factors, namely the habit of not opening windows from morning to evening. The results of this study are in line with research conducted by Widyaningtyas, (2015) in Kebumen Regency, which stated that respondents with the habit of not opening windows every day could increase the risk of toddlers getting ARI 5.28 times compared to respondents who had the habit of opening windows every day.

CONCLUSION

Based on the research conducted on Factors Related to the Incidence of ARI in Toddlers in the Kolang Health Center Work Area in 2021 with a total of 185 respondents, the following conclusions can be drawn: There is a Relationship Between Nutritional Status and the Incidence of ARI in Toddlers at the Kolang Health Center in 2021. There is no Relationship Between Smoking Habits in the House and the Incidence of ARI in Toddlers at the Kolang Health Center in 2021. There is a Relationship Between the Habit of Opening Windows and the Incidence of ARI in Toddlers at the Kolang Health Center in 2021. It is hoped that further researchers will conduct further research on ARI.

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