

Analysis of Risk Factors of ISPA on Improving Mothers' Ability to Self-Care of ISPA in Toddlers at Simalingkar Health Center

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Article Info

Keywords:

Risk of ISPA; Maternal Ability;
 Self-Care; Toddler

ABSTRACT

In Indonesia, Acute Respiratory Infection (ARI) is one of the causes of 4 million deaths in children under five. ISPA is also often on the list of the 10 most common diseases at the Simalingkar Health Center. The mortality rate of ISPA in Indonesia is still very high and morbidity because ISPA in Indonesia per year ranges from 10%-20% of the population under five. Acute Respiratory Tract Infection (ISPA) is an inflammatory process caused by viruses, bacteria, atypical (microplasma), aspiration of foreign substances involving one or all parts of the respiratory tract, a condition in which disease germs successfully attack the body tools used to breathe, namely through the nose, hair, esophagus, throat, throat to the lungs and lasts no more than 14 days. The etiology of ISPA consists of more than 300 types of bacteria, viruses and riketsia. The bacteria that cause ISPA include the genus Streptococci, Staphylococci, Pneumococcus, Haemofillus, Bordetelia and Corinebacterium. The viruses that cause ISPA include Myxoviruses, Adnoviruses, Coronaviruses, Pikornaviruses, Mycoplasma, Herpesviruses and others. In addition to being caused by viruses and bacteria, ISPA is also caused by microplasma or aspiration of foreign substances involving one or all parts of the respiratory tract. Studies in various countries show that in developing countries Streptococcus pneumonia and Haemofillus influenza are bacteria that are always found in two-thirds of the isolation results, namely 73.9% of lung aspirates and 69.1% of the isolation results from blood specimens. Meanwhile, in developed countries, adult pneumonia in children is generally caused by a virus. ISPA can be transmitted through saliva, sneezing, and breathing air that contains germs that are inhaled by healthy people into their respiratory tract. ISPA that continues to become pneumonia often occurs in children, especially if there is malnutrition and combined with unhygienic environmental conditions. Germs of ISPA disease are transmitted from the patient to others through the air of breathing or the spitting of the sufferer. In principle, the ISPA germs in the air are sucked in by the new host and enter the entire respiratory tract. From the respiratory tract, germs spread throughout the body if the infected person is vulnerable, then he will be affected by ISPA.

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INTRODUCTION

Acute Respiratory Tract Infection (ARI) is one of the leading causes of death in children in developing countries. This ISPA causes 4 out of 15 million deaths in children under 5 years old every year (WHO, 2021). Each child under five is estimated to experience 3-6 episodes of ISPA every year and the proportion of deaths caused by ISPA covers 20-30% (Shaleh, 2022).

According to WHO (2021), it is stated that ISPA disease includes upper airway disease (ARI) and lower respiratory tract disease (ARI) and its adnexia. ISPA results in small amounts of death in children, but can lead to disabilities such as otitis media which is the cause of

deafness. Meanwhile, almost all deaths due to ISPA in young children are caused by Acute Lower Respiratory Tract Infection (ARI), the most common of which is pneumonia.

In Indonesia, Acute Respiratory Tract Infections (ARI) are one of the causes of 4 million deaths in toddlers (Maryunani, 2022). ISPA is also often on the list of the 10 most common diseases at the Simalingkar Health Center. The mortality rate of ISPA in Indonesia is still very high and morbidity because the incidence of ISPA in Indonesia per year ranges from 10%-20% of the population under five (Shaleh, 2022).

Acute Respiratory Tract Infection (ARI), is an inflammatory process caused by a virus, bacterial, atypical (microplasma), or aspiration of a foreign substance involving one or all parts of the respiratory tract (L. Wong, 2022). ISPA is a condition in which disease germs successfully attack the body tools used for breathing, starting from the nose, upper esophagus, throat, throat to the lungs, and lasts no more than 14 days (Al-bahsyen, 2023).

Studies in various countries show that developing countries *Streptococcus pneumoniae* and *Haemophilus influenzae* are bacteria that are always found in two-thirds of the isolation results, namely 73.9% of lung aspirates and 69.1% of the results of isolation from blood specimens. Meanwhile, in developed countries, today pneumonia in children is generally caused by viruses (WHO, 2021).

ISPA can be transmitted through saliva, sneezing, and breathing air that contains germs that are inhaled by healthy people into their respiratory tract. ISPA that continues to become pneumonia often occurs in children, especially if there is malnutrition and combined with unhygienic environmental conditions. Germs of ISPA disease are transmitted from the patient to others through the air of breathing or the spitting of the sufferer. In principle, the ISPA germs in the air are sucked in by the new host and enter the entire respiratory tract. From the respiratory tract, germs spread throughout the body if the infected person is vulnerable, then he will be affected by ISPA (Suhandayani, 2022).

According to Prabu (2021), air pollution that occurs in the house is a supporting factor for the occurrence of respiratory infections for the residents of the house. The results of the study obtained a relationship between ISPA and air pollution, including an increased risk of bronchitis and pneumonia in children living in more polluted areas and about the health requirements of housing, permanent air conditioning or natural ventilation of at least 10% of the floor area. Air exchange (ventilation), which is the process of providing fresh air and the removal of dirty air naturally or mechanically, must be sufficient.

A number of large studies show that the incidence of respiratory diseases by the virus is surging in infants with low birth weight (BBLR), infants and early childhood. The highest incidence of ISPA occurs at the age of 6-12 months. Some studies have also shown that toddlers aged 6-12 months will suffer from ISPA more often than later ages because their immune system or antibodies are incomplete. age above 12 months is a defense achievement against ISPA, it is associated with the fulfillment of body immunity based on the provision of complete immunization, but does not promise the absence of ISPA in toddlers (Prabu, 2021).

According to Maryunani (2022), it is stated that breast milk is the best food for babies, especially in the first months of life. Breast milk is not only a source of nutrients for babies but also a powerful source of antimicroorganisms, due to the presence of several factors that work synergistically to form biological systems. Breast milk can provide passive immunization through the delivery of antibodies and competent immune cells to the surface of the upper respiratory tract. Exclusive Breastfeeding is the feeding of only babies up to the age of 6 months without providing other food/liquids. Babies who receive exclusive breastfeeding are more resistant to ISPA (less likely to be affected by ARI), because breast milk contains anti-germ substances that cause ARI. According to the Indonesian Ministry of Health, quoted from Al-Bahsyen (2021), stating that behavioral factors in the prevention and control of ISPA in infants and toddlers, in this case, are the practice of handling ISPA in the family, either by mothers or other family members. The family is the smallest unit of society that gathers and

lives in a household, dependent on each other and interacting with each other. If one or several family members have health problems, it will affect other family members.

The active role of the natural family in dealing with ISPA is very important because ISPA is a disease that exists daily in the family. This needs serious attention by all of us because many diseases affect toddlers, so that mothers of toddlers and family members who are mostly close to toddlers know and are skilled in handling this ISPA disease when their children are sick.

METHODS

The study was analytical with a Cross Sectional approach which aimed to analyze the risk factors of ISPA on the improvement of maternal ability in self-care of ISPA in toddlers from September 2025 to January 2026. The method of data collection in the research begins with taking care of an introduction to the research site and then taking care of research permits from the research site. Then the researcher asked for approval to be a respondent to mothers who came for treatment to bring toddlers who had been diagnosed with ISPA by doctors at the Simalingkar Health Center in 2025. If the mother agrees, then the researcher goes to the homes of families of toddlers suffering from ISPA to make direct observations of the objects being studied and provide questionnaires submitted in writing. Secondary data was obtained from the Simalingkar Health Center regarding the number and addresses of toddlers. Data collection was carried out using the Chi Square statistical test with a significance degree of $p < 0.05$ to analyze the risk factors of ISPA to increase the ability of mothers to self-care of ISPA in toddlers in 2025.

RESULTS AND DISCUSSION

Distribution of Frequency of Respondent Characteristics at Simalingkar Health Center

No	Features	F	(%)
1.	Age		
	20 – 25 Year	36	50,0
	26 – 30 Year	20	27,8
	31 – 35 Year	13	18,1
	≥ 36 Year	3	4,2
	Total	72	100
2	Education		
	SD	8	11,1
	SMP	42	58,3
	SMA	18	25,0
	Diploma I,III, Sarjana	4	5,6
	Total	72	100
4.	Jobs		
	IRT	57	79,2
	Private employees	10	13,9
	PNS	5	6,9
	Total	72	100

From the table above, it can be seen that the majority of respondents are between 15 – 20 years old, which is 50% and the education of the majority of respondents is junior high school (58.3%) and the majority of respondents' jobs do not work only as housewives (79.2%).

1. Environmental Factors

Distribution of Environmental Factor Frequencies in ISPA Toddlers at Simaligkar Health Center

No	Environmental Factors in ISPA Toddlers	F	(%)
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1.	No risk	29	40,3
2.	risk	43	59,7
Total		72	100

From the table above, it can be seen that environmental factors in toddlers are mostly at risk (59.7%).

2. Children's Individual Factors

Distribution of Frequency of Children's Individual Factors in Toddlers with ISPA at the Simaligkar Health Center

No	Individual Factors of Children in Toddlers with ISPA	F	(%)
1.	No risk	49	68,1
2.	risk	23	31,9
Total		72	100

From the table above, it can be seen that the majority of individual factors in children under five are not at risk (68.1%).

3. Behavioral Factors

Distribution of Family Behavior Factor Frequency in Toddler ISPA at Simalingkar Health Center

No	Family Behavior Factors in ISPA Toddlers	F	(%)
1.	No risk	28	38,9
2.	risk	44	61,1
Total		72	100

From the table above, it can be seen that the majority of family behavior factors in toddlers are at risk (61.1%).

4. The occurrence of ISPA in toddlers

Distribution of the Frequency of Occurrence of ISPA in Toddlers at the Simalingkar Health Center

No	The occurrence of ISPA in toddlers	F	(%)
1.	Lightweight	44	61,1
2.	Medium	25	34,7
3.	Weight	3	4,2
Total		72	100

From the table above, it can be seen that the majority of ISPA that occurs in toddlers is mild (61.1%).

5. Cross-tabulation and statistical test results

1. Analysis of Environmental Factors with the Occurrence of ISPA in Toddlers

Cross-Tabulation of Environmental Factors with the Occurrence of ISPA in Toddlers at Simalingkar Health Center

No	Environmental Factors	The occurrence of ISPA						Total	p	
		Lightweight		Medium		Weight				
		F	%	F	%	F	%			
1.	No risk	25	34,7	4	5,6	0	0	29	40,3	0,001
2.	risk	19	26,4	21	29,2	3	4,2	43	59,7	
Total		44	61,1	25	34,7	3	4,2	72	100	

Based on the table above, it is known that environmental factors in the majority of toddlers are at risk, namely (59.7%), as many as (4.2%) toddlers experience severe ARI, as many as (29.2%) toddlers experience moderate ARI, (26.4%) toddlers experience mild ARI. From the results of the statistical test, $p = 0.001 < 0.05$ and $\chi^2 = 13.153$, it means that there is a contribution of environmental factors to the incidence of ISPA in toddlers.

6. Analysis of Children's Individual Factors with the Occurrence of ISPA in Toddlers

Cross-Tabulation of Children's Individual Factors with the Occurrence of ISPA in Toddlers at the Simalingkar Health Center

No	Children's Individual Factors	The occurrence of ISPA						Total		p
		Lightweight		Medium		Weight		F	%	
		F	%	F	%	F	%			
1.	No risk	33	45,8	16	22,2	0	0	49	68,1	0,023
2.	risk	11	15,3	9	12,5	3	4,2	23	31,9	
Total		44	61,1	25	34,7	3	4,2	72	100	

Based on the table above, it is known that the individual factors of children in toddlers are mostly not at risk, namely (68.1%), no toddlers experience severe RICE, as many as (22.2%) toddlers experience moderate RICE, (45.8%) toddlers experience mild RICE. From the results of the statistical test, $p = 0.023 < 0.05$ and $\chi^2 = 7.556$, it means that there is a contribution of individual factors of children to the occurrence of ISPA in toddlers.

7. Analysis of Behavioral Factors with the Occurrence of ISPA in Toddlers

Cross-Tabulation of Behavioral Factors with the Occurrence of ISPA in Toddlers at Simalingkar Health Center

No	Behavioral Factors	The occurrence of ISPA						Total		p
		Lightweight		Medium		Weight		F	%	
		F	%	F	%	F	%			
1.	No risk	26	36,1	2	2,8	0	0	28	38,9	0,000
2.	risk	18	25	23	31,9	3	4,2	44	61,1	
Total		44	61,1	25	34,7	3	4,2	72	100	

Based on the table above, it is known that the majority of behavioral factors in toddlers are at risk, namely (61.1%), as many as (4.2%) of toddlers experience severe ARI, as many as (31.9%) of toddlers experience moderate ARI, (25%) of toddlers experience mild ARI. From the results of the statistical test, $p = 0.000 < 0.05$ and $\chi^2 = 19.502$, it means that there is a contribution of behavioral factors to the occurrence of ISPA in toddlers.

CONCLUSION

The results of research that have been carried out on toddlers who suffer from ISPA at the Simalingkar Health Center are known that environmental factors are at risk in toddlers, namely (59.7%), as many as (4.2%) toddlers experience severe ISPA, as many as (29.2%) toddlers experience moderate ISPA and (26.4%) toddlers experience mild ISPA. From the results of the statistical test $p = 0.001 < 0.05$ and the value $\chi^2 = 13.153$, it means that there is a contribution of environmental factors to the occurrence of ISPA in toddlers. This is caused by toddlers living in environments where ISPA is possible. The inhabitants of the house are too numerous and not proportional to the area of the house. In the toddler environment there are family members who smoke in the room, besides that the house is integrated with the kitchen and does not have a smoke pit. CO levels such as combustion smoke and cigarette smoke filling the room can stimulate headaches, coughs, irritation of the esophagus. This situation makes it easier for ISPA to occur because the environment of toddlers is always exposed to cigarette smoke. Therefore, children's environments should always be clean from

air pollution from cigarettes, cooking smoke and dust from various household furniture. Likewise, families should consider reducing the number of crowded residents by moving places so that toddlers get more fresh air. The results of this study are supported by Prabu (2021), who stated that air pollution that occurs in the house is a supporting factor for the occurrence of respiratory infections for the inhabitants of the house. The results of the study obtained that there is a relationship between ISPA and air pollution, including an increased risk of bronchitis and pneumonia in children living in more polluted areas. Cigarette smoke and smoke from burning fuel for cooking with high concentrations can damage the lung defense mechanism so that it will facilitate the occurrence of ISPA.

ACKNOWLEDGEMENT

Based on the contribution between environmental factors, individual factors, and behavioral factors with the occurrence of ISPA in toddlers. It is recommended to families or mothers to increase their knowledge or information about behavioral factors that can cause ISPA in toddlers, by listening to counseling held at the health center. Then apply it into action by maintaining the cleanliness of the family environment, maintaining personal hygiene and providing balanced nutrition to toddlers.

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