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Description of Knowledge, Behavior, and Environment With the Incidence of Acute Respiratory Infection (ARI) in Children Under Five Years at Puskesmas Trauma Center

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Abstrak

Infeksi Saluran Pernafasan Akut (ISPA) masih menjadi salah satu penyebab utama penyakit pada anak di bawah lima tahun, terutama di negara-negara berkembang seperti Indonesia. Namun, sedikit penelitian yang meneliti bagaimana pengetahuan orang tua, perilaku mereka, dan faktor lingkungan bersama-sama mempengaruhi terjadinya ISPA. Studi ini menggunakan desain deskriptif kuantitatif dengan pendekatan cross-sectional, dilakukan di Puskesmas Trauma Center di Samarinda pada bulan Juni hingga Juli 2025. Tiga puluh satu orang tua anak di bawah lima tahun yang didiagnosis dengan ISPA dipilih melalui accidental sampling dan diwawancarai menggunakan kuesioner terstruktur. Hasil menunjukkan bahwa sebagian besar responden memiliki pengetahuan yang baik tentang pencegahan ISPA, namun perilaku pencegahan mereka tidak konsisten, seperti paparan asap rokok pasif dan penggunaan masker. Risiko lingkungan seperti pembakaran limbah rumah tangga dan polusi udara dalam ruangan masih sering ditemukan. Temuan ini menunjukkan bahwa memiliki pengetahuan yang baik saja tidak cukup untuk mengurangi kasus ISPA tanpa adanya perubahan perilaku dan dukungan dari lingkungan. Studi ini menyoroti pentingnya pendidikan kesehatan masyarakat yang terintegrasi dan intervensi lingkungan untuk mencegah ISPA secara efektif pada anak di bawah lima tahun.

Abstract

Acute respiratory infections (ARI) remain one of the leading causes of illness in children under five years of age, especially in developing countries such as Indonesia. However, few studies have examined how parents' knowledge, behavior, and environmental factors together influence the occurrence of ARI. This study used a quantitative descriptive design with a cross-sectional approach, conducted at the Puskesmas Trauma Center in Samarinda from June to July 2025. Thirty-one parents of children under five years of age diagnosed with ARI were selected through accidental sampling and interviewed using a structured questionnaire. The results showed that most respondents had good knowledge about ARI prevention, but their preventive behaviors were inconsistent, such as exposure to secondhand smoke and the use of masks. Environmental risks such as household waste burning and indoor air pollution were still commonly found. These findings indicate that having good knowledge alone is not sufficient to reduce ARI cases without behavioral changes and support from the environment. This study highlights the importance of integrated public health education and environmental interventions to effectively prevent ARI in children under five years of age.

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INTRODUCTION

The World Health Organization (WHO) estimates that in Southeast Asia and Africa, deaths from ARI in children under five account for between 15 and 20 percent of total child deaths per year (Anteneh & Hassen, 2020). Countries such as India, Bangladesh, Indonesia, and Myanmar have the highest number of deaths in children under five due to ARI in the region (Katili, 2019). In Indonesia, ARI is one of the most prevalent and reported diseases in primary health facilities. According to the 2020–2023 Indonesian Health Profile, the incidence of ARI continues to increase, from 20.5% in 2020 to 46.2% in 2023 (Kemenkes RI, 2023). East Kalimantan is one of the provinces that contributes significantly to national ARI cases. Based on the 2013 National Health Survey, this province recorded an ARI incidence rate of 24.7% in children under five years of age. Although the rate declined in 2018, ARI cases increased again in the following years (Kemenkes RI, 2018). Samarinda City ranked fourth in the highest ARI cases in the province with a rate of 5.6% in 2018. Children under five years old need special care because they are the future generation and are very important for the survival of the nation. Toddlers are especially vulnerable to diseases because their immune system is not yet strong. Because of this, the rate of infant deaths is still quite high (Widoyono, 2015).

Puskesmas Trauma Center in Samarinda City is one of the health centers that receives the most cases of acute respiratory infections. In the first semester of 2025, there were 3,378 cases, with the highest number occurring in January with 696 cases. Puskesmas Trauma Center ranked first out of 24 Puskesmas in Samarinda City as the contributor with the most ARI cases. This condition shows that ARI remains a major health problem in the working area of the Community Health Center. ARI can be caused by various types of infections, such as S*treptococcus pneumoniae bacteria, Haemophilus influenzae,* and *Adenovirus viruses* (Wati et al., 2022). Transmission usually occurs through saliva droplets, direct contact, or air. Risk factors include toddler age, poor nutrition, exposure to cigarette smoke, poor indoor ventilation, and lack of proper prevention habits (Hayati, 2014). Observations at the Puskesmas Trauma Center show that most toddlers with ARI have normal nutritional status (57%) and are exclusively breastfed (87%). However, there is still a gap in parents understanding of the relationship between immunization, child care, and ARI prevention. This indicates that knowledge, habits, and the home environment remain important factors in the occurrence of ARI in the region.

The theoretical foundation for understanding ARI in relation to knowledge, behavior, and environment is rooted in theory the Health Belief Model by Lawrence Green. This theory has three main factors that influence individuals decisions to engage in healthy behaviors. First, the predisposition factors, which include various aspects such as knowledge, attitudes, beliefs, and values held by an individual. Second, enabling factors, which relate to the physical and social environment. Third, reinforcing factors, which encompass support and responses from those around the individual, including the attitudes and behaviors of healthcare workers and others in the community (Lambang, 2020). Literature indicates that low maternal knowledge about ARI symptoms, transmission, and prevention correlates with higher

incidence rates, while behaviors such as improper handwashing, exposure to tobacco smoke, and inadequate nutrition amplify risks (Hayati, 2014).

This study differs from previous studies in that it provides an overview of the interaction between knowledge, behavior, and environmental factors in ARI cases at a specific primary health center in Samarinda, using primary data from interviews and observations during internships. Previous studies have focused more on the clinical conditions of toddlers as the main causes of ARI, such as toddler nutrition, exclusive breastfeeding, adherence to basic immunizations, and vitamin A consumption. Although the results of these studies provide important insights into the biological factors of children, there are still few studies that comprehensively explore the role of knowledge, family behavior, and residential environment in the occurrence of ARI, especially in the working area of Puskesmas Trauma Center. Based on this explanation, the purpose of this study is to describe the knowledge, behavior, and environment related to ARI in children under five years of age at Puskesmas Trauma Center

METHOD

This study used a quantitative descriptive method and followed a cross-sectional approach. The research was carried out at the Trauma Center Health Center, which is located on Cipto Mangunkusumo Street, in Sengkotek Village, Loa Janan Ilir District, Samarinda City, East Kalimantan Province. The study took place between June and July 2025. The research looked at two types of variables, dependent and independent. The dependent variable was the number of children under five years old who had Acute Respiratory Infections (ARI) as diagnosed by medical staff at the Puskesmas Trauma Center. The independent variables included three areas, the level of parents knowledge about ARI, such as their understanding of causes, symptoms, how ARI spreads, and how to prevent it parents behavior in preventing ARI, like whether they smoke at home, how clean the environment is, and if they practice exclusive breastfeeding and household environmental factors, including how well the house is ventilated, how crowded the living conditions are, and how much exposure the family has to smoke. The study included all toddlers who were recorded as having ARI and received treatment at the Puskesmas Trauma Center during the study period.

The sample included 31 toddlers who had been diagnosed with ARI. The researchers used accidental sampling, which means they chose participants based on their availability and willingness to take part, as long as they met the required conditions for inclusion in the study. The study included parents or caregivers of children aged 1 to 5 years who had been diagnosed with ARI by a doctor at the Trauma Center Community Health Center. They also had to agree to take part by signing an informed consent form and be able to give full and clear information. Data was collected directly from the participants through interviews using a structured questionnaire that was made into a Google Form. The questionnaire had 28 questions that looked into the participants knowledge, actions, and family environment related to preventing ARI. All the data gathered was then used for analysis with IBM SPSS Statistics software. The analysis was done in steps, starting with univariate analysis to show how often each variable occurred, using percentages and averages.

RESULT AND DISCUSSION

This study describes the level of knowledge, behavior, and environmental conditions associated with acute respiratory infections (ARI) in children under five years of age in the working area of Puskesmas Trauma Center. The analysis was conducted on 31 respondents who were parents of toddlers diagnosed with ARI by doctors at the health center. Based on the results of data processing using SPSS Statistics, it was found that ARI is still one of the diseases with the highest incidence rate in the toddler group, especially from January-June 2025.

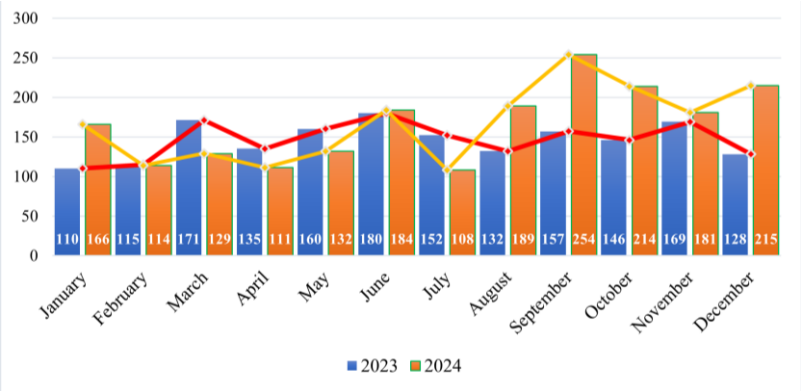

Figure 1. Trend of ISPA Cases in children by month at Puskesmas Trauma Center in 2023-2024

Data shows that the number of ARI cases in children changed during 2024–2025. The most cases happened in January 2025, with 696 cases. Then the number went down to 608 in February and 469 in March. From April to May, the number stayed about the same, with 472 and 467 cases each month. This pattern shows a seasonal trend. More cases happen at the start of the year, which is when the rainy season begins. High temperatures and humidity help respiratory viruses spread, which are the main reasons kids get ARI in tropical areas. The transition from summer to rainy season can reduce a person's immune system, which can increase the risk of respiratory tract infections. During the rainy season, the environment becomes humid, which facilitates the growth of germs, bacteria, viruses, and fungi due to the humid and dirty air (Hapipah, 2022).

Table 1. Distribution of Respondent Characteristics among Mothers and Children with ARI at Puskesmas Trauma Center in 2025

Respondent Characteristics	Frequence	Persentage
Age		
20 – 30 Years	17	55%
31 – 40 Years	13	42%
41 – 50 Years	1	3%
Total	**31**	**100%**
Level of education		
Elementary School	3	10
Junior High School	5	16
High School	17	55
University	6	19

Respondent Characteristics	**Frequence**	**Persentage**
Total	**31**	**100%**
Monthly income		
Under UMR (<3.500.000)	9	29%
Upper UMR (> 3.500.000)	22	71%
Total	**31**	**100%**
Number of children under five		
1 Person	25	81%
2 Person	6	19%
Total	**31**	**100%**
Characteristics of Child's	**Frequence**	**Persentage**
Gender		
Male	13	42%
Female	18	58%
Total	**31**	**100%**
History below the Red Line KMS in the Last 1 Year		
Yes	9	29%
No	22	71%
Total	**31**	**100%**
Premature History		
Yes	2	6%
No	29	94%
Total	**31**	**100%**
Birth weight		
≤ 2.500 gram	6	27%
≥ 2.500 gram	16	73%
Total	**31**	**100%**
Exclusive breastfeeding for the first 6 months		
Yes	27	87%
No	4	13%
Total	**31**	**100%**
Complete immunization		
Ya	23	74%
Tidak	8	26%
Total	**31**	**100%**

The characteristics of the respondents indicate that there were 31 participants, with the largest age group being 21-30 years old, comprising 17 respondents (55.5%), while the smallest age group was 41-50 years old. Additionally, the average monthly income of the respondents was highest in the category above the minimum wage (> 3,500,000), with 22 respondents (71%).

In terms of the characteristics of toddlers aged 0-<5 years diagnosed with ARI, the majority were female, with 18 respondents (58%) being girls, while 13 respondents (42%) were boys. Furthermore, 9 toddlers (29%) were recorded as being below the red line on their KMS in the past year, while the remaining 22 toddlers (71%) had never experienced this condition. In terms of birth history, only 2 toddlers (6%) had a

history of premature birth, while the majority (94%) did not. Additionally, 6 toddlers (27%) were born weighing ≤ 2,500 grams, while the remaining 16 toddlers (73%) were born weighing ≥ 2,500 grams. The coverage of exclusive breastfeeding during the first 6 months showed excellent results, with 27 infants (87%) receiving exclusive breastfeeding. Finally, regarding immunization status, 23 infants (74%) had received complete immunization according to their age, while 8 infants (26%) had not yet received complete immunization.

Table 2. Frequency Distribution of Parental Knowledge Factors with ARI in Children

Question	Correct	Wrong
ARI is an infectious disease that attacks the respiratory tract.	28 (90.3%)	3 (9.7%)
Cough and cold are symptoms of ARI	29 (93.5%)	2 (6.5%)
ARI is one of the infectious diseases	27 (87.1%)	4 (12.9%)
ARI can be transmitted through the air and saliva droplets when coughing/sneezing	30 (96.7%)	1 (3.3%)
Covering your mouth when coughing and maintaining good hygiene are ways to prevent the spread of ARI	29 (93.5%)	2 (6.5%)
If children are not given complete immunizations, they will be at high risk of contracting ARI	27 (87.1%)	4 (12.9%)
If children are not exclusively breastfed, they will be at high risk of developing ARI	23 (74.1%)	8 (25.9%)
By wearing a mask, ARI can be prevented.	30 (96.7%)	1 (3.3%)
Cigarette smoke and vehicle exhaust do not cause coughs and colds.	12 (38.7%)	19 (61.3%)
Getting plenty of rest and drinking water can reduce coughs and colds.	31 (100%)	0 (0%)

Knowledge or cognitive ability is a very important area in shaping a person's actions (Notoatmodjo, 2014). ARI is more likely to happen in children between the ages of 1 and 5 because their immune system isn't fully developed yet, making them more at risk of getting sick. If not taken care of properly, it can lead to more severe problems. Because of this, a mother's understanding and knowledge play a big role in helping to treat and prevent ARI. Frequency of respondents' answers based on parents' knowledge of ARI. Most respondents demonstrated fairly good knowledge, with 28 people (90.3%) correctly answering that ARI is an infectious disease that attacks the respiratory tract. In fact, 29 people (93.5%) also knew that coughing and colds are symptoms of ARI. However, there was a slight misunderstanding regarding the contagious nature of ARI, with 4 people (12.9%) giving the wrong answer,

indicating that there is still a lack of public knowledge about the transmission of this disease. However, the public's understanding of how ARI is transmitted was relatively good, as 30 people (96.7%) knew that ARI can be transmitted through the air and saliva droplets when coughing or sneezing. In addition, 29 people (93.5%) were aware that covering the mouth when coughing and sneezing can prevent the transmission of disease. Knowledge about how to prevent ARI by wearing a mask was also very good, as 30 people (96.7%) answered correctly.

When asked about risk factors related to immunization and exclusive breastfeeding, 27 people (87.1%) correctly answered that not receiving complete immunization carries a high risk of developing ARI, although 4 people (12.9%) still did not understand the relationship between complete immunization and the risk of developing ARI. When asked about exclusive breastfeeding, only 23 people (74.1%) answered correctly, while 8 people (25.9%) answered incorrectly. Exclusive breastfeeding for the first 6 months of a baby's life provides important antibodies to strengthen the child's immature immune system against respiratory tract infections such as ARI. Research by Anggraeni (2024) shows that children who are not exclusively breastfed are 7.556 times more likely to experience ARI than children who are exclusively breastfed. The negative impact of cigarette smoke and vehicle exhaust on ARI, 19 people (61.3%) answered correctly, while 12 people (38.7%) answered incorrectly. This indicates that the public does not fully understand the impact of smoke pollution on ARI. Furthermore, all respondents (100%) answered correctly that getting enough rest and drinking water can help relieve coughs and colds, which shows good public awareness of how to deal with ARI symptoms.

Good knowledge about respondents can be supported by several factors, such as information media, experience, socio-cultural and economic environment, and age. Age affects a person's ability to understand and their way of thinking. As someone gets older, their ability to understand and their thinking patterns develop more. Because of this, the knowledge they gain becomes better over time (Silviana, 2014). Most of the participants in this study were young adults, aged 20-30, with 17 people (55%) in that group. Nearly half were middle-aged adults, aged 31-40, totaling 13 people (42%). The smallest group was early elderly adults, with just 1 person (3%) in that age range. As someone gets older, their level of maturity and personality develops, leading to more thoughtful and effective thinking and work. In this study, the age of respondents is quite mature, as most are between 20-30 years old. Similarly, the educational level of the respondents is also moderate, with most having completed high school. However, there are other factors that can influence people's knowledge about ISPA, such as health education on ISPA for toddlers. Currently, health workers at the Puskemas Trauma Center have not conducted such educational activities, resulting in incomplete dissemination of ISPA information to the public. This leads to a lack of understanding and awareness among the community regarding the prevention and management of ISPA, which can result in an increase in the incidence of the disease at the Puskemas Trauma Center.

Table 3. Frequency Distribution of Smoking Behavior Factors with ARI in Children

Question	Yes	No
Are there any family members who smoke?	23 (74.2%)	8 (25.8%)
Do any family members smoke inside the house?	5 (16.2%)	26 (83.8%)

The frequency of respondents answers based on parental smoking behavior. A total of 23 respondents (74.2%) of parents or family members of toddlers with ARI had a smoking habit. Of the 23 respondents who had a smoking habit, 5 respondents (16.2%) still smoked inside the house. Although most respondents no longer smoke inside their homes, cases of acute respiratory infections (ARI) in toddlers are still occurring in large numbers. This phenomenon indicates that children remain exposed to cigarette smoke, not only from people who smoke indoors, but also from smoke that clings to clothing, hair, furniture, and surfaces known as third-hand smoke (THS). Pollution from secondhand smoke, which is smoke from burning cigarettes that nonsmokers breathe in, especially in the form of gases, can be reduced if there is good air ventilation. However, some parts of the smoke can stay on surfaces like floors, walls, chairs, fabrics, clothes, carpets, and furniture. This can create something called thirdhand smoke, which is a potential health risk (Drehmer, 2017). Immediate exposure to secondhand smoke from parents or household residents living in the same dwelling with young children is a serious indoor air pollution issue and increases the risk of illness from toxic substances in children. Continuous exposure can cause respiratory disturbances and lead to health problems. The more smoke family members inhale, the higher the risk of respiratory infections in young children. Studies show that children exposed smoke are 4.2 times more likely to suffer from respiratory infections compared to those not exposed (Kurniawan, 2021).

Table 4. Frequency Distribution of Preventive Behavior with ARI in Childred

Question	Always	Often	Sometimes	Never
How often does your child eat nutritious foods (vegetables, fruits, protein)?	5 (16.1%)	9 (29%)	16 (51.6%)	1 (3.2%)
If my child has a poor appetite, I always try to find out the cause.	6 (19.4%)	10 (32.3%)	14 (45.2%)	1 (3.2%)
I take my child to the health center for immunizations.	25 (80.6%)	0 (0%)	6 (19.4%)	0 (0%)
I encourage my child to wash their hands diligently before and after eating and engaging in outdoor activities.	18 (58.1%)	5 (16.1%)	5 (16.1%)	3 (9.7%)

Question	Always	Often	Sometimes	Never
I keep my child away from cigarette smoke or smoke from burning.	13 (41.9%)	5 (16.1%)	7 (22.6%)	1 (3.2%)
I cover my mouth when I want to cough or sneeze.	16 (51.6%)	7 (22.6%)	8 (25.8%)	0 (0%)
If any family member has a cold, I will keep my child away from them.	12 (38.7%)	12 (38.7%)	7 (22.6%)	0 (0%)
When I am sick, I always wear a mask diligently so that my child doesn't get infected.	10 (32.3%)	5 (16.1%)	12 (38.7%)	4 (12.9%)

Based on Table 4, the frequency of respondents answers regarding parental behavior factors that are at risk for the occurrence of ARI in young children in Puskesmas Trauma Center. Most of the respondents, specifically 16 respondents (51.6%), said that their children sometimes eat healthy foods like vegetables, fruits, and protein sources. Only 5 respondents (16.1%) answered that their children always eat healthy food, 9 respondents (29%) said their children often eat healthy food, and 1 respondent (3.2%) said their children never eat healthy food. The "never" response was explained because the child was still under six months old and had not yet been allowed to eat solid food. These results show that there are still limitations in the consistency of providing healthy food to children, even though balanced nutrition is very important for improving the immune system, especially in preventing infectious diseases like respiratory infections. Infectious diseases can worsen nutritional status, and people with poor nutrition are more likely to get infected. The body has enough ability to protect itself from infections when it is well-nourished. If nutrition gets worse, the body's immune response decreases, and the ability to protect against infections becomes weaker. Bacteria and viruses can then more easily cause illness (Widyawati et al., 2020).

Subsequently, the responses from parents regarding their efforts when their child experiences a decrease in appetite show varied results. 14 respondents (45.2%) stated they sometimes try to find ways to get their child to eat, 10 respondents (32.3%) said they often do so, 6 respondents (19.4%) stated they always do so, and 3 respondents (10%) said they never do. These findings indicate that most parents do not have consistent routines or active efforts to address their child's loss of appetite. This is concerning as reduced food intake can weaken the immune system and prolong recovery if the child is ill. Regarding immunization compliance, the majority of respondents displayed positive behavior. 25 respondents (80.6%) stated they always take their child to posyandu or health

centers for immunizations, while 6 respondents (19.4%) said they sometimes do so. These results suggest that community awareness of the importance of immunization is relatively high. Vaccination is one way to help a person build active immunity against contagious diseases like the common cold (Wahyuni et al., 2020). In terms of the implementation of the habit of washing hands before and after eating, 18 respondents (58.1%) answered always, while 3 respondents (9.7%) answered never. This inconsistency is generally caused by some respondents still having young children who are not yet able to perform the activity independently. The correct action of washing hands with soap is one of the basic preventive measures to avoid the spread of infectious microorganisms, including respiratory infections (Budiwibowo, 2022).

Regarding the efforts of parents in keeping their children away from exposure to secondhand smoke or burning, 13 respondents (41.9%) answered always, 7 respondents (22.6%) answered sometimes, and the rest showed other variations in their answers. This data indicates that protection of children from indoor air pollution has not yet been fully optimal. In the context of direct prevention behaviors, 16 respondents (51.6%) said they always cover their mouths when coughing or sneezing, 7 respondents (22.6%) said they often do so, and 8 respondents (25.8%) said they sometimes do. Covering the mouth when coughing or sneezing is one of the important cough etiquettes that help prevent the spread of diseases through droplets. Next, regarding the behavior of keeping children away from family members who are sick with cold or flu-like symptoms, 12 respondents (38.7%) said they always or often do so, while 7 respondents (22.6%) said they sometimes do. This shows that some parents understand the importance of isolation or limiting contact with sick individuals, although there are still some respondents who haven't applied this practice fully. Then, when asked about the habit of wearing a mask when sick, most respondents answered that they sometimes do so (12 respondents or 38.7%), and 4 respondents (12.9%) answered that they never do. The low habit of wearing masks when sick shows that there is still a gap in public understanding about the importance of preventing disease spread through the air. In fact, wearing a mask is one of the most effective ways to reduce the spread of respiratory diseases, including colds and flu.

The poor implementation of preventive measures indicates significant challenges in the execution of preventive actions. It is still found that parents of children have not adequately protected their children from air pollution such as secondhand smoke, which remain suboptimal and pose a risk for the development of respiratory diseases like ARI and many people often think using a mask is not important, but wearing a mask when sick is actually an important way to prevent the spread of infectious diseases like the common cold and flu. One main strategy in preventing ARI is actively involving the families of children to recognize early signs of ARI, so they can take the child to health workers quickly for proper treatment and to avoid complications. The behavior of preventing ARI in toddlers is influenced by several factors according to the Health Belief Model by Lawrence Green. These factors include predisposing factors such as the mother's knowledge, which falls into the category of having good prevention practices and understanding of infantile pulmonary

infections. The goal is to ensure a clean environment and good behavior, although the role of local health workers in providing health education to the community or nearby residents is not yet optimal (Sormin, 2023).

Table 5. Frequency Distribution of Environmental Factors with ARI in Children

Question	Yes	No
Are you or your neighbors burning trash around the house?	19 (61.3%)	12 (38.7%)
Do you close the door/window if there is garbage burning?	21 (67.7%)	10 (32.3%)
Is there cooking fuel smoke inside the house?	21 (67.7%)	10 (32.3%)
Is there smoke from burning mosquitoes in the house?	5 (16.2%)	26 (83.8%)
Has the child had direct contact with someone who is sick (coughing, sneezing, runny nose) in the last 2 weeks?	23 (74.2%)	8 (25.8%)
Is the area where you live often passed by large vehicles?	9 (29.1%)	22 (70.9%)
Is the type of flooring in your house made of ceramic tiles?	22 (70.9%)	9 (29.1%)
Is the room in your house dusty?	20 (64.5%)	11 (35.5%)
Does the clean water used by your family come from one of the following sources: PDAM (regional water supply company)/well/dug pump/dug well/protected spring?	29 (93.5%)	2 (6.5%)
Getting plenty of rest and drinking water can reduce colds and coughs.	27 (87.1%)	4 (12.9%)

Based on the results in Table 5, which shows how often respondents mentioned environmental factors in the homes of young children who had Acute Respiratory Infections (ARI), several important findings were identified that relate to the potential environmental risks affecting children's health. First, regarding the burning of waste around the house, 19 respondents (61.3%) said that this activity is still carried out in their living environment. This indicates that most families live in areas where burning waste is a common practice, which can lead to air pollution through smoke and fine dust particles. This condition can increase the risk of breathing problems in young children, especially if the burning happens regularly and is close to where they live. Burning trash quickly produces sulfur dioxide, which is one of the reactive gases known as "sulfur oxides." Sulfur dioxide is linked to several harmful effects on the respiratory system and other environmental issues (Roy & Sardar, 2015). Next, 10 respondents (32.3%) said they do not close their doors or windows during waste burning. This suggests that there is a high chance that the smoke from burning can enter

the house and pollute the indoor air. Direct exposure to smoke can cause irritation of the airways, coughing, and worsen ARI symptoms, particularly in children whose respiratory systems are still sensitive.

Next, regarding the factor of smoke from cooking fuels used indoors, it was found that 21 respondents (67.7%) said yes, while 10 respondents (32.3%) answered no. This data shows that most households still use cooking fuels that can produce smoke, such as wood, charcoal, or kerosene. If these fuels are used without proper ventilation, they can increase indoor air pollution levels. Indoor air pollution, especially from using solid fuels like firewood and charcoal for cooking, increases the risk of ARI in young children (Nurhayati et al., 2025). The study shows that using wood for cooking at home is connected to the occurrence of ARI in young children, with the level of use being 96.4% (Leonardus & Anggraeni, 2019). Among the respondents, 5 (16.2%) answered yes and 26 (83.8%) answered no when asked about the use of insect repellent in the home. Although the percentage is relatively small, the use of insect repellent still needs to be considered. The aim is to compare the incidence of pneumonia in children whose parents use insect repellent in the room with those who do not. Smoke from insect repellent can irritate the respiratory tract of infants, making them more susceptible to infection by bacteria or viruses that can lead to pneumonia (Kusparlina, 2022).

Next, regarding direct contact between children and people showing symptoms of ISPA in the past two weeks, most respondents, 23 out of 31 (74.2%), answered "yes." This high number suggests that ISPA can spread directly in the surrounding environment, whether at home or in the community where young children interact. Spread through droplets from an infected person is a major risk factor that can speed up the spread of the disease among children. On the other, 22 respondents (70.9%) reported that they do not live in areas often passed by large vehicles or dusty places. This condition is protective because it reduces exposure to external air pollution and particles produced by motor vehicles. In terms of physical conditions of the house, 22 respondents (70.9%) use ceramic or tile flooring, while the rest use wooden flooring. Ceramic floors have a surface that is easy to clean, which helps reduce the accumulation of dust and microorganisms inside the house. Room humidity can increase due to water-resistant floors such as concrete or plastered floors. This causes liquid evaporation, leading to bacterial growth and potentially causing respiratory diseases (Medhyna, 2019).

Nevertheless, 20 out of 31 (64.5%) reported that there is still dust in certain parts of their homes. Dust can act as a medium for microorganisms and can worsen indoor air quality, especially for children who often play on the floor or low surfaces. In addition, 29 out of 31 (93.5%) have access to clean water from the local water company/PDAM. Reliable access to clean water reflects a good level of household sanitation and supports healthy habits like handwashing and regular house cleaning, which indirectly lowers the risk of respiratory infections. Lastly, when asked about the importance of rest and drinking water when sick to reduce coughing and cold symptoms, 27 out of 31 (87.1%) answered "yes." This shows that most parents or caregivers understand basic home care practices for early symptoms of respiratory infections in young children. Overall, these results show that although most respondents

have healthy habits and maintain clean environments, external risk factors like burning waste and indoor dust remain significant issues in the Trauma Center Puskesmas area and require attention and solutions.

CONCLUSION

The results of this study indicate that the incidence of Acute Respiratory Infection (ARI) in children under five years of age at the Puskesmas Trauma Center is still high and closely related to the knowledge, behavior, and environmental conditions of the parents. Most respondents have a good level of knowledge regarding the symptoms, transmission, and prevention of ARI, yet this understanding has not been fully reflected in preventive behaviors such as avoiding exposure to cigarette smoke, maintaining nutritional intake, or consistent mask use when sick. Environmental factors, including burning waste around homes and indoor air pollution from cooking smoke, also contribute significantly to ARI incidence. Thus, it can be concluded that ARI prevention requires not only individual awareness but also collective behavioral changes and environmental improvement efforts within the community.

Based on the results, this study recommends that health promotion activities at the Puskesmas Trauma Center should be improved, especially through education about preventing ARI and the importance of keeping the environment smoke-free to help reduce ARI in children under five. Further research is recommended to include clinical and sociodemographic variables for toddlers, so as to provide a more complex picture of the risk factors that influence the incidence of ARI in toddlers. The study has some limits because the sample size was small and the research was done at one point in time. More studies with a bigger group and long-term follow-up are needed to better explain the causes of ARI in toddlers.

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