

The Relationship of Home Environmental Conditions with the Status of Acute Respiratory Infections in Adults in the East City Health Center Area

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ABSTRACT

Acute Respiratory Infection (ARI) is one of the health problems that still often occurs in the community and can be affected by unhealthy home environmental conditions. Home environmental conditions such as poor ventilation, lack of lighting, high humidity, occupancy density, and inadequate sanitation can increase the risk of ISPA. This study aims to determine the relationship between home environmental conditions and ISPA status in adults in the East City Health Center area. This study uses a quantitative design with a cross sectional approach. The study population amounted to 1,720 adults who had experienced ISPA in the East City Health Center area. A sample of 95 respondents was obtained using the purposive sampling technique based on the Slovin formula. The research instrument used questionnaires of home environmental conditions and medical record data to determine ISPA status. Data analysis was carried out univariate and bivariate using the Spearman Rho test with a significance level of $\alpha = 0.05$. The results of the study showed that most of the respondents had poor home environmental conditions and experienced severe ARI. The results of the statistical test showed that there was a significant relationship between the condition of the home environment and the status of ISPA in adults in the East City Health Center area with a p-value of < 0.05 . This study concludes that poor home environmental conditions increase the risk of severe ISPA in adults.

INTRODUCTION

Acute Respiratory Tract Infection (ARI) is a disease that can affect one or more parts of the respiratory tract, starting from the nose (upper duct) to the alveoli (lower duct) and their adnexic tissues such as the sinuses, middle ear cavity, and pleura. And ISPA is also included in the category of infectious diseases, especially for individuals who have disorders in the immune system (Ariyanto, 2022).

According to (World Health Organization, 2023), globally it is estimated that 13 million people have died from ARI. The burden of the disease varies greatly from approximately 4 million to 13 million adults each year. The most cases of ISPA occurred in India with 43 million, China with 21 million, Pakistan with 10 million and Bangladesh, Indonesia, with 6 million people each.

The high prevalence of ISPA is not only found in developed countries, but also in developing countries such as Indonesia. Based on the 2023 Indonesian Health Survey (SKI), the prevalence of Acute Respiratory Infections (ARI) at all ages in Indonesia reached 23.5% based on diagnosis/symptoms. This figure shows that almost one in four Indonesians experienced ISPA in the survey period. Some provinces with prominent prevalence rates include Mountainous Papua (41.7%), Central Papua (39.4%), and East Nusa Tenggara (36.3%). In addition, Gorontalo Province is also recorded to have an ISPA prevalence of 15.3%, which shows that ISPA remains a health issue that needs attention in efforts to improve health services and prevention at the community level (Risksedas, 2023).

Based on data from the Gorontalo Provincial Health Office in 2025, ISPA cases are recorded quite high in various regions. Gorontalo City with a total of 18,997 cases. Furthermore, Gorontalo Regency recorded 11,408 cases, Bone Bolango Regency 6,924 cases, Boalemo Regency 3,362 cases, Pohuwato Regency 3,670 cases, and North Gorontalo Regency 8,351 cases. These figures show that ISPA in Gorontalo remains in the top 5 most common diseases in Gorontalo (Gorontalo Provincial Health Office, 2025). Based on these data, Gorontalo City ranks first with the most ISPA cases. In addition, if you look at the trend of ISPA cases in Gorontalo City in the last three years, there has been a significant increase. In 2023, there were 8,893 cases, then almost doubled in 2024 to 17,801 cases, and continues to increase until it reaches 18,997 cases in 2025. This increase in ISPA cases shows that ISPA is still a major health problem in Gorontalo City.

Based on data from the Gorontalo City Health Office in 2025, the number of ISPA cases spread across 10 health centers in Gorontalo City. Of these, the work area of the East City Health Center is in first place with the number of ISPA cases as many as 1,720 in adults. After that, it was followed by the North City Health Center with a total of 1,399, the Dungingi Health Center with a total of 1,333, the Piloladaa Health Center with a total of 1,206, the Sipatana Health Center with a total of 1,186, the Dumbo Raya Health Center with a total of 1,146, the South City Health Center with a total of 1,106, the Hulonthalangi Health Center with a total of 1,012, the Central City Health Center with a total of 896, and the least is the West City Health Center with a total of 866 (Gorontalo City Health Office, 2025).

One of the efforts made by the local government through the Gorontalo Provincial Health Office in overcoming cases of Acute Respiratory Infection (ARI) is to strengthen promotive and preventive programs through health counseling activities in the community, especially in areas with high rates of ARI. However, even though various programs have been implemented, ISPA cases still show quite high numbers every year. This shows that the efforts made by the government have not been fully effective, so further research needs to be done to find out the factors that still affect the high level of ISPA in the community (Gorontalo Provincial Health Office, 2025).

Some of the factors that affect ISPA are the physical environment of the house, the biological environment, the social environment, the chemical environment, among these various factors, the physical environment of the home is the closest factor to daily life and greatly affects respiratory health (Bintara, 2023).

The physical condition of a healthy home environment is a house that meets the criteria, namely the house building must have lighting, sufficient movement space, ventilation, in addition to that a good house must have clean water facilities, sewage channels and garbage cans (Herdiani et al., 2021). Then the unhealthy physical condition of the home environment is a risk factor for the spread of disease. An unhealthy home is usually characterized by poor ventilation so that air exchange is not optimal, high humidity, insufficient lighting, and unstable room temperature. Conditions like this make the air inside the house stuffy and humid, which is an ideal environment for microorganisms to thrive. In addition, unclean floors or made of soil, the use of solid fuels such as wood or charcoal in the kitchen, as well as the habit of smoking indoors can increase the levels of pollutants and harmful particles in the air. The cleanliness of water sources that are poorly maintained and household waste that is not managed properly can also worsen environmental conditions, thus having an impact on the increased risk of environment-based diseases, including ISPA (Muhammad Fahri, 2025).

Based on previous research that has been conducted by (Nanda et al., 2024) with the title "The Relationship between Home Physical Environmental Conditions and the Incidence of ISPA in the Rengas Health Center, Medan Marelan Island. It was found that there was a significant relationship between the relationship between the physical condition of the house and the incidence of ISPA in the Rengas Health Center, Medan Marelan Island. The novelty of this study lies in the focus of age, the location of the research and the respondents studied. If the previous research by (Nanda et al., 2024) was conducted at the Rengas Health Center on Medan Marelan Island with respondents from various age groups of children, adolescents, adults, and the elderly (9-60 years), then this study focuses specifically on the adult age group (19–59 years) which has not been widely researched, this study focuses on the status of ISPA while in the previous study it focused on the incidence of ARI. In addition, this research was conducted in the working area of the East City Health Center of Gorontalo City, which until now has never been a similar research location. This difference in focus and location is the novelty of this study, so it is expected to provide new data and different perspectives on the relationship between home environmental conditions and Acute Respiratory Infection Status (ISPA) in adults in the East City Health Center Area, Gorontalo City.

Based on the results of interviews and initial observations conducted by researchers at the East City Health Center, Gorontalo City on October 16, 2025, of 8 adults with a history of ISPA, it is known that 6 respondents live in home environments that do not meet health standards. 3 respondents admitted that the house has inadequate ventilation, so the air inside the house feels stuffy and humid, especially in the rainy season. 4 respondents also said that their houses rarely get direct sunlight because the distance between houses is very close. In addition to conducting interviews, the researcher also conducted direct observations to 3 respondents' houses to see the condition of the environment where they lived, including lighting, ventilation, occupancy density, and cleanliness of the environment around the house. From the results of these observations, the researcher found that the respondent's house had a physical condition such as low ventilation, minimal lighting, and a dirty surrounding environment. From the results of these interviews and observations, researchers also found that people have not realized the importance of healthy home conditions as an effort to prevent respiratory diseases.

Furthermore, an interview conducted by the person in charge of the ISPA program at the East City Health Center, information was obtained that ISPA cases in the health center's work area will still be relatively high in 2025, especially in adults. Environmental conditions, people's behavior that still often throws garbage carelessly, smoking habits in the house, and lack of awareness to check themselves when experiencing initial symptoms also worsen the situation. The health center has actually made various efforts such as health counseling, home visits, and fostering a healthy environment, but the results have not been optimal. This shows the need for further research to determine the relationship between the condition of the home environment and the status of ISPA in the work area of the East City Health Center.

Seeing that cases of ISPA in the work area of the East City Health Center are most common in the adult age group, and supported by field findings that show that many adults live at home with environmental conditions that do not meet health standards, this group is important to study. Adults are a productive group with high mobility so that ISPA not only has an impact on individual health, but also decreases productivity and increases the risk of transmission in the family environment. In addition, research on ISPA still rarely focuses on the adult age group, so more specific research is needed to understand the contribution of home environmental conditions to the high rate of ISPA in this group in the East City Health Center area.

Based on the background description above, the researcher is interested in conducting research on the Relationship between Home Environmental Conditions and the Status of Acute Respiratory Infections in Adults in the East City Health Center area.

RESEARCH METHODS

This research was carried out at the East City Health Center on January 14 – February 20, 2026. Types of quantitative research The research design used in this study is quantitative research with a cross sectional approach. Cross sectional research is a type of research that emphasizes the time of measurement/observation of independent and dependent variable data only once at a time. The data collection method in this study used a questionnaire of the environmental condition of the house, and ISPA based on medical records with a sample of 95 respondents.

RESEARCH RESULTS

Univariate Results

Characteristics of Respondents Based on Demographic Data

Table 1. Characteristics of Respondents by Age

Yes	Age	Frequency (n)	Percentage (%)
1	19-25 years old (Early Adult)	17	17,9
2	26-45 years old (Early Intermediate Adult)	46	48,4
3	46-59 years old (Late Intermediate Adult)	32	33,7
Total		95	100

Based on the table above, the characteristics of respondents based on Age were found that the age group with the highest number of respondents was 26-45 years old (Early Middle Adult) as many as 46 respondents (48.4%), while 46-59 years old (Late Middle Adult) as many as 32 respondents (33.7%).

Table 2. Respondent Characteristics by Gender

Yes	Gender	Frequency (n)	Percentage (%)
1.	Men – men	34	35,8
2.	Women	61	64,2
Total		95	100

Based on the table above, the characteristics of respondents based on gender show that most of the respondents are female, namely 61 respondents (64.2%).

Table 3. Characteristics of Respondents Based on Occupation

No	Jobs	Frequency (n)	Percentage (%)
1.	Labor	14	14.7
2.	IRT	25	26.3
3.	Students	11	11.6
4.	Private	39	41.1
5.	Employees	6	6.3
Total		95	100

Based on the table above, the characteristics of respondents based on work show that the most respondents' jobs are self-employed as many as 39 respondents (41.1%) while IRT is 25 respondents (26.3%).

Table 4. Respondent Characteristics Based on Marital Status

No	Marital Status	Frequency (n)	Percentage (%)
1.	Unmarried	30	31.6
2.	Married	59	62.1
3.	Doubt	1	1.1
4.	Janda	5	5.3
Total		95	100

Based on the table above, data on respondent characteristics based on marital status was obtained showing marital status, most of the respondents had a life partner of 59 people (62.1%), while respondents with unmarried status amounted to 30 people (31.6%)

Table 5. Respondent Characteristics Based on Smoking Status

No	Status Merokok	Frequency (n)	Percentage (%)
1.	Active	27	28.4
2.	Passive	42	44.2
3.	No Smoking	26	27.4
Total		95	100

Based on the table above, showing smoking status, most of the respondents were passive smokers as many as 42 people (44.2%), while respondents with active smokers amounted to 27 people (28.4%), and the rest did not smoke amounting to 26 people (27.4%).

Table 6. Characteristics of Respondents Based on Recent Education

No	Final Education	Frequency (n)	Percentage (%)
1	SD	8	8.4
2	SMP	14	14.7
3	SMA	58	61.1
4	D4/S1	15	15.8
Total		95	100

Based on the table above, data on respondent characteristics based on last education showed that the last level of education of respondents was high school as many as 58 respondents (61.1%), while D4/S1 amounted to 15 respondents (15.8%).

Table 7. Distribution of Respondents Based on Acute Respiratory Infections

No	ISPA	Frequency (n)	Percentage (%)
1.	Lightweight ISPA	26	27.4
2.	Heavy ISPA	69	72.6
Total		95	100

Based on the table above, the distribution of acute respiratory infection respondents shows that respondents with ISPA are mostly in the severe ISPA category with a total of 69 respondents (72.6%).

Table 8. Distribution of Respondents Based on Home Environmental Conditions

No	Home Environmental Conditions	Frequency (n)	Percentage (%)
1.	Good	16	16.8
2.	Enough	17	17.9
3.	Not Good	36	37.9
4.	Not Good	26	27.4
Total		95	100

Based on the table above, the distribution of respondents based on shows that the environmental conditions of the house are mostly in the poor category with a total of 36 respondents (37.9%).

Bivariate Results

Table 9. The Relationship between Home Environmental Conditions and Acute Respiratory Infection Status in the East City Health Center area

Variabel	N	P- Value	Spearman' Rho Value
Home Environmental Conditions (KLR)	95	0,000	0,532
ISPA			

Based on the table above, the bivariate analysis shows that the results of the Spearman's rho correlation test, a correlation coefficient value between ISPA and Home Environmental Conditions (KLR) of 0.532 was obtained, which indicates a positive relationship with moderate strength. This means that the better the condition of the home environment, the lower the risk of ISPA occurring. On the other hand, the worse the condition of the home environment, the higher the risk of ISPA. A significance value (Sig. 2-tailed) of 0.000 which is smaller than 0.01, suggests that the relationship is statistically significant. With a sample of 95 respondents, it can be concluded that there is a meaningful relationship between KLR and ISPA in the research conducted.

DISCUSSION

Status of Acute Respiratory Infection in Adults in the East City Health Center Area

Based on the results of a study conducted on patients with Acute Respiratory Infection in the East City Health Center area regarding the status of ISPA, it showed that most of the respondents were in the severe ISPA category with a total of 69 respondents (72.6%). This shows that the majority of respondents experience acute respiratory infections in quite serious conditions, if associated with the characteristics of respondents based on age that the majority are in the category (early middle adult) namely 46 respondents and also (late middle adult) 32 respondents. Respondents with severe ISPA generally experience signs and symptoms such as a heavy cough accompanied by phlegm, high fever, shortness of breath, rapid breathing, chest pain, sore throat, and excessive fatigue. In addition, some respondents also experienced decreased appetite, weak bodies, and sleep disturbances due to persistent coughing. These conditions show that severe ISPA can have a significant impact on the activities and quality of daily life of respondents.

ISPA is an infection that attacks the upper and lower respiratory tract and lasts less than 14 days, while in the severe category it is characterized by symptoms such as cough accompanied by shortness of breath, high fever, and rapid breathing. The high number of cases of severe ISPA can indicate that exposure to risk factors such as unhealthy environmental conditions, inadequate home ventilation, and exposure to cigarette smoke is still quite high, thus increasing the risk of developing ISPA with a heavier severity.

Physiologically, increasing age is related to a decrease in immune system function and lung function, where in middle adulthood there is a decrease in the elasticity of lung tissue, vital capacity, and the effectiveness of the mucociliary defense mechanism of the respiratory tract. This condition causes the body to become more susceptible to infection, while the inflammatory process in older age tends to last longer because the immune response is not as effective as in early adulthood, so symptoms such as shortness of breath, high fever, and increased respiratory frequency are more likely to develop into severe category ARI.

This condition is supported by research conducted by the World Health Organization (2023) which explains that increasing age is related to decreased immune system function (immunosenescence) and decreased respiratory function, so that individuals of middle and advanced age are more at risk of developing respiratory infections with a higher severity than younger ages (World Health Organization, 2023).

This is also in line with a report by the Ministry of Health of the Republic of Indonesia through Riskesdas (2018) which shows that the prevalence of respiratory disorders increases in the age group ≥ 40 years, where this age group is more prone to complications due to decreased immunity and lung function (Ministry of Health of the Republic of Indonesia, 2018).

Researchers assume that in middle adulthood there begins to be a physiological decline in immune system function and lung function, so that when individuals are exposed to unhealthy environmental risk factors, the body is unable to provide an optimal defense response to respiratory pathogens. This condition causes the infection that occurs to tend to develop into the severe category.

The results of the next study showed that 26 respondents had a mild ISPA of 27.4%. When associated with the characteristics of the gender respondents, most of them were women, namely 61 respondents 64.2%. Respondents with mild ISPA generally experience signs and symptoms such as cough, runny nose, nasal congestion, sore throat, sneezing, mild fever, and headache. In addition, some respondents also complained of weakness and discomfort when breathing, but the symptoms experienced were still relatively mild and did not cause severe respiratory distress.

Biologically, women have a relatively stronger immune response than men, which is influenced by hormonal factors such as estrogen which play a role in increasing humoral and cellular immune responses, so that the female body more quickly recognizes and fights pathogens that cause respiratory tract infections and prevents the development of more severe diseases. In addition to biological factors, in terms of health behavior, women generally have a higher awareness of the symptoms of the disease and tend to seek health services faster, so that treatment in the early stages of ISPA can be carried out earlier and the condition of the disease remains in the mild category without developing to a more severe degree.

These findings are supported by the results of a study by Qi et al. (2021) which showed that women with acute respiratory tract infections have a stronger adaptive immune response characterized by higher levels of anti-inflammatory cytokines than men, suggesting that biological differences in the immune system can affect the severity of the disease.

This is in line with the research of Regis et al. (2021). It shows that the immune response of antivirals (e.g. interferon) is stronger in women than in men, which can result in milder clinical outcomes in respiratory tract infections.

Researchers assume that gender has a role in influencing the severity of ARI. This assumption is based on theories and the results of previous research explaining that women have a relatively stronger adaptive immune and antiviral response than men, influenced by hormonal factors such as estrogen which play a role in increasing immune cell activity and protective cytokine production. This more effective immune response allows the pathogen elimination process to take place faster, thus preventing the progression of infection to a more severe degree.

The Condition of the House Environment in the East City Health Center Area

Based on the results of the research conducted in the East City Health Center area, of the 95 respondents, most of them had poor home environmental conditions in the poor category, namely 36 respondents (37.9).

This shows that the quality of the physical environment of houses in the area is still a public health problem. Unhealthy environmental conditions can be caused by inadequate ventilation, insufficient natural lighting, high occupancy density, and suboptimal household waste management, which in theory can increase air humidity, worsen air circulation, and facilitate the growth of microorganisms that cause respiratory diseases.

These findings are in line with research conducted by Putri (2021) which examined the relationship between the physical condition of the home and the Status of Acute Respiratory Infection (ARI). The study analyzed several components of the home environment such as ventilation, occupancy density, temperature, humidity, and floor and wall conditions. The results showed a significant relationship between several physical components of the house and the incidence of ISPA, especially in houses with unqualified ventilation and high occupancy density.

This is in line with research conducted by Wijayanti et al. (2021) which examined the influence of healthy home indicators on the Status of Acute Respiratory Infections (ARI) in Tangerang. The study analyzed indicators such as ventilation, lighting, occupancy density, and floor and wall conditions. The results showed a significant relationship between meeting the criteria for healthy housing and ARI status, where homes that do not meet health standards have a higher risk of respiratory infections. These findings confirm that the physical condition of the home is an important factor in the prevention of ARI.

The poor condition of the home environment is also inseparable from the economic factors of the community. Low socioeconomic status affects the ability of families to provide decent and healthy housing. Limited income causes individuals to tend to live in homes with physical conditions that do not meet health standards, such as poor ventilation, lack of lighting, high occupancy density, and inadequate sanitation.

According to the World Health Organization (2023), socioeconomic factors are important determinants of health that affect living conditions, access to clean water, sanitation, and the quality of the physical environment of the home. People with low economic levels have limitations in improving their home conditions or moving to a healthier environment, making them more vulnerable to exposure to disease risk factors, including respiratory infections.

In addition, the theory of social determinants of health explains that low economic conditions can lead to limitations in meeting basic needs, including housing deprivation. This condition has an impact on increasing housing density and poor air quality in the house. A dense and unhealthy home environment will increase humidity and facilitate the spread of microorganisms, thereby increasing the risk of aris.

In line with the concept of environmental health, the physical condition of the house is greatly influenced by the family's economic ability. The lower the economic level, the more likely an individual is to live in an environment with poor air quality and unqualified sanitation, which ultimately impacts the increased incidence of environment-based diseases.

Thus, economic factors are one of the fundamental causes of the poor environmental conditions of the house in the work area of the East City Health Center, which indirectly contributes to the high risk of ISPA in the community.

The researcher assumes that the high proportion of respondents with poor and bad home environmental conditions in the poor and bad categories in the work area of the East City Health Center is due to the limitations of economic factors that affect the community's ability to provide healthy housing. Low economic conditions cause most respondents to live in homes with inadequate ventilation, lack of lighting, high occupancy density, and environmental sanitation that does not meet health standards.

In addition to poor and unfavorable home environmental conditions, researchers also found research results in the East City Health Center area, as many as 16 respondents (16.8%) had good home environmental conditions.

The good category describes that the physical components of the house such as ventilation, lighting, occupancy density, and floor and wall conditions have met health standards so as to allow optimal air circulation, sufficient sunlight entry, and reduce room humidity that can inhibit the growth of microorganisms that cause ISPA.

These findings are in line with research conducted by Sukria (2020) which examined the relationship between home environmental conditions and ISPA status. The results of the study showed that respondents who lived at home with physical conditions that met health standards had a lower risk of developing ARI.

This is in line with research by Aryanti (2021) in the form of a literature review that also concluded that good physical quality of the home, including optimal air circulation and controlled humidity, is associated with a decrease in Acute Respiratory Infections (ARI). Homes that meet health indicators are able to reduce exposure to pollutants and microorganisms indoors, thereby providing protection against respiratory disorders.

Researchers assume that good and sufficient home environmental conditions play a protective role against ISPA, because adequate ventilation, adequate lighting, appropriate occupancy density, and physical conditions of the home that meet health standards can maintain air quality and inhibit the growth of microorganisms. In addition, respondents in this category are likely to have better health awareness, socioeconomic conditions, and clean and healthy living behaviors. Therefore, increasing education and promotive-preventive interventions regarding healthy homes can be an effective strategy in reducing the risk of ISPA in the work area of the East City Health Center.

In addition to good home environmental conditions, researchers also found that the results of research in the work area of the East City Health Center, as many as 17 respondents (17.9%) had adequate home environmental conditions. The category simply illustrates that some of the physical components of the house have met health standards, but there are still some aspects that are not optimal, such as inadequate ventilation, limited natural lighting, relatively high occupancy density, and the condition of the floor and walls of the house that have not fully met the requirements of a healthy house. These conditions can cause poor air circulation in the house and increase room humidity which has the potential to support the growth of microorganisms that cause Acute Respiratory Infections (ARI).

These findings are in line with research conducted by Rahmat.et.al (2020) which examined the relationship between the physical condition of the home and ISPA. The results of the study show that houses with sufficient physical conditions still have a risk of ISPA because ventilation and lighting that are not optimal cause the air quality in the house to be unhealthy. In addition, research by Aryanti in a literature review concluded that the condition of the house that has not fully met the indicators of a healthy house, especially related to room humidity and occupancy density, is related to an increased risk of respiratory disorders including ISPA. Houses with poor air circulation can increase exposure to pollutants and microorganisms in the room, affecting the health of the occupants of the house.

Another study conducted by Sukria (2020) also states that the environmental condition of the house category is quite related to the incidence of ISPA because there are still environmental risk factors that can affect the air quality in the house. A home environment that does not meet all health requirements allows for the accumulation of dust, smoke, and humidity that can trigger respiratory tract disorders.

The researcher assumes that the environmental condition of the home category is sufficient in the respondents, which can still be a risk factor for the occurrence of ISPA if improvements are not made to the physical condition of the house. Suboptimal ventilation, inadequate lighting, and high occupancy density can cause the air quality in the house to be unhealthy and facilitate the development of disease-causing microorganisms. In addition, this condition may be influenced by the level of public knowledge, socioeconomic conditions, and clean and healthy living behaviors that have not been implemented optimally. Therefore, health education and promotive-preventive

interventions are needed regarding the importance of healthy homes so that the community is able to improve the quality of the home environment and reduce the risk of ISPA in the work area of the East City Health Center.

The Relationship between Home Environmental Conditions and Acute Respiratory Infection Status in the East City Health Center Area

Based on bivariate analysis using the Spearman's rho test, a significance value of 0.000 (<0.05) was obtained, which means that there is a significant correlation between independent variables (relationships with home environmental conditions) and dependent variables (acute respiratory infections). From these results, it can be assumed that H0 is rejected and H1 is accepted, which means that there is a relationship between the condition of the home environment and the status of acute respiratory infection in adults in the East City Health Center area.

The results of this study show that the better the condition of the home environment, the lower the risk of ISPA occurring. On the other hand, the worse the condition of the home environment, the higher the risk of ISPA. The conditions in question include ventilation, lighting, humidity, occupancy density, floor type, kitchen fuel use, smoking habits in the house, water sources, and waste management.

These findings are in line with the World Health Organization's concept of ISPA risk factors which affirms that indoor air quality, inadequate ventilation, and exposure to domestic pollution are the main determinants of respiratory infections. Poor ventilation and high humidity favor the growth and spread of disease-causing microorganisms.

The results of this study are also consistent with the findings of Nanda et al. (2024) which show a significant relationship between the physical condition of the home environment and ISPA, where houses with unqualified ventilation, high occupancy density, and no kitchen smoke drains have a greater risk of experiencing ISPA.

As well as research by Nurlia et al. (2025) which states that ventilation and the type of house floor are significantly related to the occurrence of ISPA. Pathophysiologically, an unhealthy home environment increases exposure to dust particles, smoke, and pathogenic microorganisms that enter through the respiratory tract, triggering an inflammatory response, and if the immune system decreases, infection is more likely to occur and develop into ARI.

In adults, although the immune system is relatively more mature than in children, repeated exposure to an unhealthy environment still increases the risk of infection, especially in individuals with smoking habits or having comorbidities. In addition to the physical factors of the house, the behavior of residents such as smoking in the house, rarely opening windows, and lack of environmental cleanliness also worsen air quality and increase the risk of ISPA, so it can be concluded that the environmental condition of the house and health behavior have a relationship in affecting the status of ISPA in adults in the East City Health Center area.

Based on the results of the research analysis, it was known that as many as 32 respondents with poor home environmental conditions were in severe ARI. This condition can be attributed to the characteristics of respondents based on smoking status, where the majority of respondents in this study stated that they were in the category of passive smoking of 42 people. In theory, exposure to cigarette smoke is one of the main risk factors for the occurrence of Acute Respiratory Tract Infections (ARI).

According to the World Health Organization, indoor cigarette smoke contains thousands of harmful chemicals, including fine particles (PM_{2.5}), carbon monoxide, and carcinogenic substances that can damage the airway epithelium. In passive smokers, continuous exposure to secondhand smoke in a poorly ventilated home will increase airway irritation, decrease mucociliary function, and weaken the local defense mechanisms of the lungs. As a result, pathogenic microorganisms are more likely to enter and develop, thus increasing the risk of ISPA, even to a degree of severity.

This is in line with a study conducted by Jayanti et al. (2023) which found that exposure to cigarette smoke in the home is significantly related to an increase in the occurrence of ISPA, especially in environments with unqualified ventilation.

Supported by research by Rahmawati et al. (2024), it also shows that individuals who live with smokers have a higher risk of experiencing severe ISPA compared to those who are not exposed to cigarette smoke. These results reinforce that the combination of poor physical condition of the home and exposure to cigarette smoke increases the likelihood of respiratory disorders.

Based on the researchers' assumptions, the high number of respondents with severe ISPA in a poor home environment may be due to the interaction between unhealthy physical environmental factors and exposure to cigarette smoke as behavioral factors that worsen respiratory conditions. Poorly ventilated houses cause cigarette smoke to be trapped indoors, so that the concentration of pollutants increases and is inhaled for a long time by the occupants of the house who do not smoke. This chronic exposure can exacerbate inflammation of the respiratory tract and aggravate the degree of ARI. Therefore, it can be assumed that improving the condition of the home environment without a change in smoking behavior in the house is not necessarily effective in reducing the risk of ISPA optimally. Comprehensive interventions, both in environmental and behavioral health aspects, are key to preventing severe ISPA in the community.

The results of the study further showed that as many as 24 respondents with poor home environmental conditions were in the category of severe IRA. This condition can be attributed to the characteristics of respondents based on employment status, where the majority of respondents work in the self-employed sector as many as 39 people, and most of them are factory workers. In theory, work in a factory environment carries the risk of exposure to dust, smoke, chemicals, as well as industrial pollutant particles that can disrupt the respiratory system. According to the World Health Organization, exposure to air pollution, both in the work environment and in the home, is the main risk factor for respiratory disorders including ISPA. Continuous exposure to harmful particles can cause irritation of the airway mucosa, decrease lung defense function (mucociliary), and trigger inflammatory processes. If the exposed individual also lives in a home with poor ventilation conditions and inadequate sanitation, then the risk of severe ISPA will increase due to dual exposure, namely from the workplace and the home environment.

This is in line with research conducted by Pratama et al. (2023) showing that industrial workers have a higher risk of respiratory disorders compared to non-industrial workers, especially in work environments with exposure to dust and chemicals without optimal protection.

This is supported by research by Sari et al. (2024) and also found a significant relationship between high-risk types of work (such as factory workers) and ISPA, especially when accompanied by unsanitary home conditions. This shows that work and living environment factors have a mutually reinforcing role in increasing the risk of ISPA.

Based on the researchers' assumptions, the high status of severe ISPA in respondents who work in factories and live in unfavorable home environments is likely due to accumulated exposure to pollutants from the workplace and home. Factory workers who are exposed to dust or chemicals during working hours have the potential to experience decreased respiratory tract resistance. When these conditions are exacerbated by an unhealthy home environment, such as inadequate ventilation or high occupancy density, the respiratory system recovery process becomes suboptimal and the risk of severe ISPA increases. Thus, prevention efforts need to focus not only on improving home conditions, but also on occupational health protection, the use of personal protective equipment, and education about the importance of maintaining air quality in the residential environment.

The results of the study showed that there were 3 respondents with good home environmental conditions but in the category of severe ISPA. This condition shows that severe ISPA is not only influenced by factors in the home environment, but can also be influenced by internal factors of the individual, one of which is genetic factors. In theory, genetic factors play a role in determining the body's immune system's ability to fight infections. Individuals who have a family history of respiratory diseases such as asthma, allergies, bronchitis, or certain immune system disorders tend to be more prone to experiencing more severe respiratory distress despite living in a healthy environment.

A good home environment such as adequate ventilation, adequate lighting, maintained house cleanliness, and smooth air circulation should help reduce the risk of ISPA. However, in individuals with certain genetic predispositions, exposure to even small amounts of microorganisms can trigger a heavier inflammatory response in the respiratory tract. Genetic factors can also affect the body's ability to repair infected tissues so that the healing process becomes slower and the symptoms of ISPA develop to become more severe.

This is in line with research by Rahmawati et al. (2023) which states that individuals with a family history of respiratory disease are more likely to experience severe ISPA than individuals without a genetic history, despite living in a health-qualifying home environment. The study explains that hereditary factors can affect the sensitivity of the airways to infections and irritations.

This is also supported by research by Pratama et al. (2024) which found that genetic factors are related to the severity of respiratory diseases through their influence on the body's immune response and inflammatory processes. Individuals with certain genetic vulnerabilities are more prone to shortness of breath, severe coughing, and recurrent infections than other individuals under the same environmental conditions.

Based on the researchers' assumptions, 3 respondents who experienced severe ISPA despite living in a good home environment likely had genetic factors that caused the airway defense system to be more sensitive to infection. The existence of a family history of respiratory disorders or low immunity is suspected to affect the severity of the disease experienced by the respondents. Therefore, genetic factors are estimated to be one of the causes that contribute to the occurrence of severe ISPA in respondents even though the environmental conditions of the home are already relatively good.

The results of the study further showed that as many as 13 respondents with good home environmental conditions were in the category of mild IRA. If it is related to the characteristics of the respondents' married status, where the majority of respondents are married as many as 59 people. In theory, marital status is often associated with social support and a more regular lifestyle. Married individuals tend to have a family support system that can affect health behaviors, such as maintaining home cleanliness, paying attention to ventilation, nutritional intake, and adherence in seeking treatment when experiencing symptoms of illness. Partner support can increase awareness in keeping the home environment healthy and encourage clean and healthy living behaviors. According to the concept of social determinants of health put forward by the World Health Organization, social factors such as family support and household conditions play a role in determining an individual's health status, including in the prevention of infectious diseases such as ISPA.

This is in line with research by Lestari et al. (2023) showing that individuals who have good family support tend to experience milder symptoms of ISPA due to attention to environmental conditions and a quick response to early symptoms.

This is supported by the research of Hidayat et al. (2024) who also found that married status is related to better health-seeking behavior than unmarried individuals, so that disease treatment can be carried out earlier and prevent worsening of conditions.

Based on the researchers' assumptions, married respondents are likely to have a shared role and responsibility in maintaining healthy home conditions, so that the quality of the home environment is better maintained. In addition, the presence of a partner can encourage individuals to seek treatment immediately when experiencing symptoms of ISPA so that the disease does not develop into severe. Therefore, the combination of good home environmental conditions and social support from the spouse is suspected to contribute to the emergence of ISPA in the mild category in the respondents of this study.

The results of the next study showed that as many as 7 respondents with sufficient home environmental conditions were in the category of mild SAI. If associated with the characteristics of respondents at the level of education, most of them had high school education as many as 58 people.

In theory, the level of education is closely related to the individual's knowledge, mindset, and ability to receive and understand health information.

According to the theory of social determinants of health, education is one of the factors that affect clean and healthy living behaviors and the ability to create a home environment that meets health standards. Individuals with higher levels of education tend to have a better understanding of the importance of adequate ventilation, home hygiene, waste management, and disease transmission prevention. In addition, education also affects the ability to recognize early symptoms of disease and make decisions to get health services immediately. With good home environmental conditions and adequate health understanding, emerging ISPA status tends to be in the mild category.

This is in line with research by Lestari et al. (2023) showing that respondents with secondary and higher education levels have a lower risk of experiencing severe ISPA compared to low-educated respondents.

This is supported by research Andini et al. (2024) also found that education level is significantly related to respiratory disease prevention behaviors, including the habit of maintaining environmental cleanliness and indoor air circulation. The findings suggest that education plays a role in shaping health behaviors that impact the severity of the disease.

Based on the researchers' assumptions, the majority of respondents with a high school education likely already have sufficient basic knowledge about the importance of maintaining the cleanliness and health of the home environment. This can contribute to the creation of good home conditions and the ability to take preventive measures when symptoms of BPI appear, so that the disease experienced does not develop into a severe category. Thus, education level can be a supporting factor in reducing the severity of ISPA through increased knowledge and better health behaviors.

The results of the study showed that there were 2 respondents with poor home environmental conditions but were in the category of mild IRA. This condition shows that although the home environment has risk factors that can trigger respiratory disorders, the severity of the ARIA experienced by respondents can be influenced by other factors, one of which is the body's immune condition. In theory, the immune system has an important role in protecting the body from viral and bacterial infections that cause ARI. Individuals with a good immune system tend to be able to fight infections more effectively so that the symptoms that appear do not develop into severity.

Poor home environmental conditions such as inadequate ventilation, high humidity, minimal lighting, and the presence of dust or air pollution in the house can increase the risk of exposure to microorganisms that cause ARI. However, in individuals with a good immune system, the body is still able to maintain the defense function of the respiratory tract through natural immune mechanisms such as the work of white blood cells and the mucociliary system in the airways. This causes the infection to cause only mild symptoms such as cough, cold, or sore throat without progressing to severe shortness of breath or other complications.

This is in line with research by Fitriani et al. (2023) which showed that individuals with good immunity tend to experience ISPA in the mild category despite living in an environment with poor air quality. The study explains that an optimal immune system can help the body control the development of infection-causing microorganisms thereby accelerating the healing process.

This is also supported by research by Rahman et al. (2024) who found that immunity status has a relationship with the severity of ISPA. Individuals with a healthy lifestyle, adequate rest, and good nutritional intake tend to have a stronger immune response so that the risk of severe ISPA is lower even in a less healthy environment.

Based on the researchers' assumptions, 2 respondents who experienced mild ISPA despite living in a bad home environment were likely to have a good enough immune condition to be able to fight respiratory infections optimally. Good immunity is thought to help prevent the development of infection from becoming more severe even though respondents are still exposed to risk factors from an unhealthy home environment. Therefore, the immunity factor is estimated to play a role in causing the ISPA experienced by the respondents to remain in the mild category.

CONCLUSION

Based on the results of a study conducted on the Conditions of the Home Environment with Acute Respiratory Infections in Adults in the East City Health Center Area, it can be concluded that:

Acute respiratory infections in adults in the East City Health Center area with the severe category amounted to 69 respondents (72.6%), and the mild category 26 respondents (27.4%).

The condition of the house environment in the East City Health Center area with the poor category amounted to 36 respondents (37.9%), the bad category amounted to 26 respondents (27.4%), the sufficient category amounted to 17 respondents (17.9%), and the good category amounted to 16 respondents (16.8%)

There was a significant association between home environmental conditions and acute respiratory infection status in adults with a p-value of 0.000 ($p < 0.05$).

ADVICE

For Respondents

It is hoped that the public can increase awareness in maintaining the quality of the home environment by improving ventilation, maintaining house cleanliness, reducing occupancy density, and avoiding smoking habits in the house to reduce the risk of ISPA.

For the East City Health Center

It is necessary to improve health promotion and education programs regarding healthy homes, indoor air pollution control, and the importance of clean and healthy living behaviors (PHBS). Home visit programs and health counseling can be optimized as an effort to prevent ISPA in a sustainable manner.

For Community Nurses

It is hoped that it can be more active in early detection of ISPA risk factors in the community and provide education related to healthy home environment modifications.

For the Next Researcher

It is recommended to conduct research with a broader design, adding other variables such as nutritional status, history of comorbidities, and work environment factors in more depth in order to obtain a more comprehensive picture of the risk factors for ARI.

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