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Risk Factors of Acute Upper Respiratory Tract Infection Incidence (Non-COVID-19): A Case Study in the Work Area of Sukorejo Primary Healthcare Center, Pacitan Regency

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Abstract

Introduction: Acute Upper respiratory tract infection was the highest case among the other diseases in Sukorejo Primary Healthcare Center, Pacitan Regency. Health protocol policies have an impact on healthy living behavior, which can prevent COVID-19 and acute upper respiratory infection (non-COVID-19). Rumors in the community stated that all acute upper respiratory infections had been tested for COVID-19, and were declared positive for COVID-19. This study aimed to determine the factors associated with acute upper respiratory tract infections (non-COVID-19).

Methods: This study was conducted in an analytic observational method with a case-control study design. There were 61 subjects in the case and 61 subjects aged 26-65 years in the control groups. Sampling was done by simple random sampling for the case and purposive sampling for the control group. Data were analyzed by chi-square tests and logistic regression models.

Results: Based on bivariate analysis, the inappropriate use of masks, smoking, inappropriate hand washing habits, high density on room occupancy, and inappropriate house ventilation area were the risk factors of acute upper respiratory tract infections (non-COVID-19). After controlling for the other variables, smoking habits (OR=2.723; 95%CI=1.216-6.098; p=0.015), inappropriate house ventilation area (OR=2.569; 95%CI=1.149-5.743; p=0.022), high density in room occupancy density (OR=2.425; 95%CI=1.087-5.410; p =0.031) and the inappropriate use of masks (OR=2.320; 95%CI=1.021-5.173; p=0.045) were the risk factors of acute upper respiratory tract infection (non-COVID-19) incidence.

Conclusion: The risk factors of acute upper respiratory tract infection (non-COVID-19) incidence were smoking habits, inappropriate house ventilation, high density in room occupancy and the inappropriate use of masks.

Keywords: acute upper respiratory tract infection, non-COVID-19, risk factors, smoking, house ventilation, mask, room occupancy.

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Introduction

Based on 2018 Basic Health Research, the prevalence of acute upper respiratory tract infection in Indonesia in 2013 was 38% and decreased to 13.7% in 2018.[1] East Java Province gets 7th place, which is 15.5%.[2] According to the 2018 East Java Basic Health Research Report, Pacitan Regency is ranked 23rd, which was 13.09%.[3]

Based on the medical record report at Sukorejo Primary Healthcare Center, cases of upper respiratory tract infection were the number one disease at Sukorejo Primary Healthcare Center from 2018 to 2021. The total cases of acute upper respiratory tract infection in 2018 were 238 cases[4] and in 2019 there were 656 cases.[5] In December 2019 the community was excited about the occurrence of the COVID-19 disease.[6] World The Health Organization declared COVID-19 on March 12, 2020 as a pandemic.[7] And on March 2, 2020, the first 2 cases of COVID-19 infection were found which were reported by President Joko Widodo.[8]

To prevent the impact of COVID-19 in the hope of breaking the chain of spread, the Ministry of Health implements a health protocol.[9] Currently, the health protocol that is being implemented is known as the "5 M", namely wearing masks, washing hands, maintaining distance, staying away from crowds, and reducing mobility.[10] The implementation of health protocols will improve healthy living behavior, improve public health status, and the community will be prone to diseases, especially those related to the respiratory tract.

In 2020 the cases of acute upper respiratory tract infections at Sukorejo Primary Healthcare Center decreased to 437 cases.[11] This can happen due to under-reporting in which the number of cases of respiratory infections in the acute upper part is more than that recorded at Sukorejo Primary Healthcare Center because people who fall ill choose not to check themselves into health facilities because they are afraid of being tested positive for COVID-19 by the medical facility and got COVID-19. In addition, with the implementation of health protocols, people's behavior will be better. Although cases of acute upper respiratory tract infections decreased in 2020, they remain number one at Sukorejo Primary Healthcare Center.

Factors that affect the occurrence of ARI are demographic factors such as age and nutritional status[12] Another influential factor is the lack of knowledge.[13] Other factors that can affect acute upper respiratory tract infection are the physical environment of the house and community behavior.[14] Room density, ventilation area, floor type, wall type, and ceiling are factors that can increase the risk of acute upper respiratory tract infection.[12,15] According to the 2019 Sukorejo Primary Healthcare Center Health Profile, the percentage of houses that did not meet the requirements was 33%.[5] The environment and components of the house with conditions that do not meet the requirements are factors of various diseases. Bad environmental conditions can disrupt the balanced of environment, agent, and host or known as the Epidemiological Triangle which causes disease in the host.[16]

In addition to the physical home environment, people's behavior can also affect acute respiratory infections. The use of masks, smoking habits, the habit of opening the windows of the house, the habit of washing hands, and the habit of cleaning the house are factors that can increase the risk of acute upper respiratory tract infections. [12,17–19] Based on the summary of the behavior of clean and healthy life (PHBS) questionnaire conducted by the Sukorejo Primary Healthcare Center in 2020, 58.25% of the population smoked. Meanwhile, 98.22% of the people washed their hands with soap. Unhealthy behavior can make it easier for someone to get sick.

Based on the medical record report from the Puskesmas Information System at Sukorejo Primary Healthcare Center from January 1, 2021 to September 30, 2021 various diseases with the most sufferers were acute upper respiratory tract infections with a total of 361 patients. Where the most acute upper respiratory tract infections suffered in the age range of 26-65 years with a total of 117 people or 56%.[20]

Based on this, it is the reason for the author to examine the risk factors that affect the incidence of acute upper respiratory tract infection (Non-COVID-19) in the work area of the Sukorejo Primary Healthcare Center, Pacitan Regency. The results of this study are expected to immediately implement prevention and control efforts quickly and precisely and sustainably. The things that distinguish this research from previous research are place

and time. This study is not the same as previous research, this study uses a case-control research design with bivariate and multivariate analysis, this study aims to find risk factors for acute respiratory infections during the COVID-19 pandemic, and the respondents in this study were adults with the age range of 26-65 years.

Methods

The independent variables in this study were age, knowledge level, use of masks, smoking habits, hand washing habits, house cleaning habits, house window opening habits, room occupancy density, house ventilation area, and house ceilings. Age is categorized into 2 groups, the age of 26-45 years and 46-65 years which is included in the elderly.

The knowledge level is categorized into 3 groups, poor category for people who can answer correctly with a score of 55% of the questions given, the category is enough for people who can answer correctly with a score of 56%-75%, and a good category for people who can answer correctly with score 76%-100% of the questions given. The use of masks is categorized into 2 groups, the inappropriate category for people who never or sometimes wears a mask when traveling/out of the house and meeting and talking with sufferers of acute respiratory infections (non-COVID-19) and the appropriate category for people who often wear a mask when traveling/out of the house and meeting and talking with people with acute respiratory infections (non-COVID-19).

Smoking habits are categorized into 2 groups, the smoking category for people whose family members smoke in the house and have a smoking habit and the non-smoking category for people who do not have family members who smoke in the house and do not have a smoking habit. The habit of washing hands is categorized into 2, namely the inappropriate category for people who do not or sometimes wash their hands with soap which is associated with activities that will or have been carried out and the appropriate category for people who frequently wash their hands with soap associated with activities that will or have been carried out.

The habit of cleaning the house is categorized into 2 groups, the inappropriate category for people who clean the house less than 2 times a day and the appropriate category for people who are more than the same as 2 times a day in cleaning the house. The habit of opening the windows of the house is categorized into 2, the inappropriate category for people who don't open their windows every day or sometimes open their windows in the morning and afternoon and the appropriate category for people who often open windows every day in the morning and afternoon.

The room occupancy density is categorized into 2 groups, groups, the ineligible category for people whose room area is less than 8 m^2 for 2 people and the eligible category for people whose room area is more than 8 m^2 for 2 people. The ventilation area is categorized into 2, namely the ineligible category for people whose house ventilation area is less than 10% of the floor area and the eligible category for people whose house ventilation area is more than 10% of the floor area. The ceiling of the house is categorized into 2, the ineligible category for people whose houses do not have ceilings and the eligible category for people whose houses have ceilings. The dependent variable in this study is the incidence of acute respiratory infections (non-COVID-19).

The type of research used is observational analytic using a case-control approach. The cases in this study were residents aged 26-65 years who, according to medical records, suffered from acute upper respiratory tract infection (non-COVID-19) from January 01 to September 30, 2021 who live in the work area of Sukorejo Primary Healthcare Center, Pacitan Regency, with a total of 117 people. The control population in this study are residents aged 26-65 years who have no complaints, signs, and symptoms of acute upper respiratory tract infection (non-COVID-19) and are a close neighbor with a radius of less than 1 km with a group of cases in the work area Sukorejo Health Center, Pacitan Regency.

The subjects were 122 people consisting of 61 case samples and 61

control samples using a case-control research formula (unpaired categorical analysis). The case samples are residents aged 26-65 years who, according to the medical record report at Sukorejo Primary Healthcare Center, Pacitan Regency, suffered from acute upper respiratory tract infections (non-COVID-19, which has been proven by negative antigen and PCR test results until the quarantine period was over, detected by both examinations, and based on a diagnosis by a health worker) and resides in the work area of the Sukorejo Primary Healthcare Center, Pacitan Regency. While the control sample is residents aged 26-65 years who have no complaints, signs, or symptoms of acute upper respiratory tract infection and are close neighbors with a radius of less than 1 km with cases and reside in the work area of the Sukorejo Primary Healthcare Center, Pacitan Regency.

The sampling technique used is simple random sampling for case samples starting with looking for the names of respondents according to medical record reports suffering from acute upper respiratory tract infections. Next, select respondents randomly according to the number of case respondents needed. While the sampling technique used is purposive sampling for control samples is the determination of the sample with certain considerations. Sources of data consist of primary data obtained directly from respondents and secondary data obtained from the Primary Healthcare Center. The instrument used is a questionnaire with interview, observation, and documentation data collection techniques. Data analysis used chi-square to determine the relationship between the independent variable and the dependent variable and logistic regression to determine the effect of several independent variables simultaneously on the dependent variable. The variables included in the analysis are variables that have a p-value <0.25 in the chi-square.

Results

The frequency distribution of respondents' characteristics of male sex was 27 people (22.1%) and female was 95 people (77.9%). The respondent's latest education was not/not yet graduated from elementary school/equivalent as many as 1 person (0.8%), graduated from elementary school/equivalent as many as 39 people (32%), graduated from junior high school/equivalent as many as 44 people (36.1%), graduated from high school/equivalent as many as 31 people (25.4%), 1 person graduated from Diploma (0.8%), and 6 people graduated from bachelor (4.9%). Respondents' occupations as private employees were 9 people (7.4%), civil servants were 2 people (1.6%), entrepreneurs were 3 people (2.5%), traders were 5 people (4.1%), 1 fisherman (0.8%), 1 tailor (0.8%), 1 midwife (0.8%), 1 laborer (0.8%), 44 farmers (36.1%), and 55 housewives (45.1%).

Bivariate analysis (**Table 1**) variables of knowledge level, age, house cleaning habits, house window opening habits, and house ceiling had no significant relationship with the incidence of acute respiratory infections (non-COVID-19). While the variables of use of masks, smoking habits, hand washing habits, room occupancy density, and house ventilation area had a significant relationship with acute respiratory infections (non-COVID-19).

Analysis of the use of masks obtained a value of p <0.05 which indicates there is a relationship between the use of masks and acute respiratory infections (non-COVID-19) with an OR of 3.103 (95% CI = 1.451-6.638), meaning that people who use masks inappropriately have a 3.103 times greater risk of experiencing acute respiratory infections (non-COVID-19) than people who wear the appropriate masks. Analysis of smoking habits obtained a p-value <0.05 which indicates there is a relationship between smoking habits and acute respiratory infections (non-COVID-19) with an OR of 2.784 (95% CI = 1.327-5.839), meaning that people who smoke have a risk of 2.784 times are more likely to have acute respiratory infections (non-COVID-19) compared to non-smokers.

Table 1. Bivariate Analysis on Acute Respiratory Infection incidence (Non-COVID-19)

Variables	ARI				Total	%	*p value*	OR (95%CI)
	Case	%	Control	%				
Age								
46-65 years	24	39.3	22	36.1	46	37.7	0.709	1.150
26-45 years	37	60.7	39	63.9	76	62.3		(0.553-2.393)
Knowledge Level								
Poor	29	47.5	21	34.4	50	41.0		0.414 (0.167-1.023)
Enough	20	32.8	19	31.1	39	32.0	0.153	0.543 (0.211-1.400)
Good	12	19.7	21	34.4	33	27.0		
Use of Masks								
Inappropriate	45	73.8	29	47.5	74	60.7	0.003	3.103
Appropriate	16	26.2	32	52.5	48	39.3		(1.451-6.638)
Smoking Habits								
Smoking	42	68.9	27	44.3	69	56.6	0.006	2.784
Non-smoking	19	31.1	34	55.7	53	43.4		(1.327-5.839)
Hand Washing Habits								
Inappropriate	39	63.9	26	42.6	65	53.3	0.018	2.386
Appropriate	22	36.1	35	57.4	57	46.7		(1.152-4.944)
House Cleaning Habits								
Inappropriate	29	47.5	22	36.1	51	41.8	0.199	1.607
Appropriate	32	52.5	39	63.9	71	58.2		(0.778-3.317)
House Window Opening Habits								
Inappropriate	27	44.3	20	32.8	47	38.5	0.193	1.628
Appropriate	34	55.7	41	67.2	75	61.5		(0.780-3.397)
Room Occupancy Density								
Ineligible	41	67.2	27	44.3	68	55.7	0.011	2.581
Eligible	20	32.8	34	55.7	54	44.3		(1.237-5.387)
House Ventilation Area								
Ineligible	42	68.9	26	42.6	68	55.7	0.004	2.976
Eligible	19	31.1	35	57.4	54	44.3		(1.416-6.252)
House Ceiling								
Ineligible	45	73.8	41	67.2	86	70.5	0.427	1.372
Eligible	16	26.2	20	32.8	36	29.5		(0.628-2.998)

Analysis of handwashing habits obtained a p-value <0.05 which indicates there is a relationship between handwashing habits and acute respiratory infections (non-COVID-19) with an OR of 2.386 (95% CI = 1.152-4.944), meaning that people who have the inappropriate handwashing habits have a 2.386 times greater risk of experiencing acute respiratory infections (non-COVID-19) compared to people who have appropriate handwashing habits. Room occupancy density analysis obtained a p-value <0.05 which indicates there is a relationship between room occupancy density and acute respiratory infection (non-COVID-19) with an OR of 2.581 (95% CI = 1.237-5.387), meaning that people have room occupancy density that ineligible have a 2.581 times greater risk of experiencing

acute respiratory infections (non-COVID-19) compared to people who have a room occupancy density that eligible.

Analysis of the area of home ventilation obtained a p-value <0.05 which indicates there is a relationship between the area of home ventilation and acute respiratory infections (non-COVID-19) with an OR of 2.976 (95% Cl = 1.416- 6.252), meaning that people have home ventilation area that ineligible have a 2.976 times greater risk of experiencing acute respiratory infections (non-COVID-19) compared to people who have home ventilation area that eligible.

Furthermore, the variables with p-value <0.25 were analyzed using a logistic regression test to determine the variable which affects the acute respiratory tract infection (non-COVID-19).

Multivariate analysis (**Table 2**), use of masks (p=0.045; OR=2.320; 95%Cl=1.021-5.273), smoking habits (p=0.015; OR=2.723; 95%Cl=1.216-6.098), room occupancy density (p=0.031; OR=2.425; 95%Cl=1.087-5.410), house ventilation area (p=0.022; OR=2.569; 95%Cl=1.149-5.743) significantly affected the incidende of acute respiratory infections (non-COVID-19).

Table 2. Multivariate Analysis with Incidence of Acute Upper Respiratory Tract Infection (Non-COVID-19)

Variables	p value	OR	95%Cl
Use of Masks	0.045	2.320	(1.021-5.273)
Smoking Habits	0.015	2.723	(1.216-6.098)
Room Occupancy Density	0.031	2.425	(1.087-5.410)
House Ventilation Area	0.022	2.569	(1.149-5.743)
Constant	0.000	0.122	

Discussion

Multivariate analysis using logistic regression with the results obtained that after controlling for other variables, the variables that significantly affect the incidence of acute respiratory infections (non-COVID-19) in the work area of the Sukorejo Primary Healthcare Center, Pacitan Regency are the variables of smoking habits, house ventilation area, room occupancy density, and the use of masks.

After controlling for other variables, the most influential variable in the incidence of acute respiratory infection (non-COVID-19) is smoking habits. The risk of acute respiratory infection (non-COVID-19) in people who smoke is 2.723 times greater than in people who do not smoke. This study is in line with research of Jangga and Mawar (2018) which states that the results of the multivariate analysis are the same, namely the smoking habit variable has the strongest relationship to ARI.[21] This is supported by research of Jayanti (2018) which shows smoking history is the most dominant variable affecting the incidence of ARI.[22] Environmental tobacco smoke is an important risk factor for ARI.[23]

Based on the results of research interviews conducted, it is known that 68.9% of people who smoked indoors are related to patients with acute respiratory infections (non-COVID-19). Smoking can cause respiratory problems, especially aggravating the incidence of ARI.[17] In addition to being harmful to the health of smokers, smoking also endangers the health of those around them. The impact of cigarette smoke is greater for passive smokers because when an active smoker burns a cigarette and inhales it, the smoke inhaled is the main smoke while the smoke that comes out of the end of the cigarette is side smoke. Where this smoke contains more combustion products than the main smoke.[22] People in contact with smokers are more susceptible[24] and show a higher likelihood of respiratory infections than those who had no contact with smokers.[25]

Smoking can affect family health and the health of the home environment. Where cigarette smoke contains 7,300 chemicals that are between the tar and gas particles. By smoking indoors, cigarette smoke collects more which can interfere

with air circulation. The smoke in the house can be inhaled by family members and in the environment outside cigarette smoke can cause air pollution.[26] Cigarette smoke inside the house is more dangerous than outside because people spend 60% to 90% of their time in 1 day at home.[22]

Exposure to cigarette smoke for 30 minutes can cause damage to endothelial cells and blood clotting cells and cause constriction and vascular rigidity (et al., 2020) that making it easier for pathogens to overcome the first-line defense system respiratory tract[28] thus making them vulnerable to ARI.[29]

After controlling for other variables, variable that affects the incidence of acute respiratory infections (non-COVID-19) is the house ventilation area. Where people who have ineligible ventilation areas have a 2.569 times greater risk of acute respiratory infection (non-COVID-19) than people who have home ventilation areas that are eligible. This study is in line with research of Hidayanti and Darwel (2020) which states that the results of the multivariate analysis are the same, namely the area of ventilation that is ineligible can increase the incidence of acute upper respiratory tract infection and the dominant factor in the incidence of acute upper respiratory tract infection is ventilation.[30]

Based on the results of research interviews conducted, it was found that 68.9% of patients with acute respiratory infections (non-COVID-19) had ineligible ventilation areas. According to Prabowo & Muslim (2018) the fixed ventilation area is at least 5% and the incidental area is at least 5% of the floor area of the house.[31] From the results of the study, it is known that 42 houses had fixed ventilation areas that were ineligible and 15 houses had incidental ventilation areas that were ineligible. Lack of proper ventilation significantly associated with acute upper respiratory tract infection.[32] However, this situation can be overcome by using a fan, opening the door in the morning, and avoiding using furniture that quickly absorbs moisture such as wood and leather.[15] Good ventilation is paying attention to health requirements and needs.[33]

Home ventilation has a function, namely, the first function is to maintain air turnover so that it remains healthy and maximal and removes the air from the house from smoke, odors, and dust.[34] The air that enters the house must be clean and free from smoke from exhaust, dust, garbage, and plastic. Efforts are made for air to flow with cross ventilation, namely by positioning the ventilation facing between 2 walls with the hope that air supply is met and air output is optimal.[35] Smoke from poorly ventilated homes can increase the chance of exposure.[36]

Lack of ventilation will cause a lack of O_2 which is needed for the occupants of the house so that the level of CO_2 which has toxic properties increases. The second function is to free the air from disease-causing bacteria. Good ventilation can provide clean air and can affect the intensity of lighting in the house. Meanwhile, poor ventilation can cause reduced air circulation[37] and interfere with the respiratory tract[38] because it can cause the house to become damp and stuffy so that it becomes a breeding ground for viruses and bacteria that cause ARI.[39]

After controlling for other variables, variable that affects the incidence of acute respiratory infections (non-COVID-19) is the room occupancy density. Where people who have a room occupancy density that is ineligible have a risk of acute respiratory infection (non-COVID-19) 2.425 times greater than people who have a room occupancy density that is eligible. Based on the results of research interviews conducted, it is known that the percentage of patients with acute respiratory infections (non-COVID-19) who had room occupancy density ineligible of 67.2%. This situation was due to the size of the room was not balanced with the number of occupants in the room. Rooms that were ineligible were occupied by 2 people totaling 13 people, occupied by 3 people totaling 24 people, and occupied by 4 people totaling 4 people.

Rooms with a large number of occupants, narrow, and lack ventilation can increase air pollution in the room and affect endurance.[40] Very dense housing makes air circulation less, the air feels hot and can be toxic to the occupants.[41] A small

bedroom with a large number of occupants can lead to an unbalanced ratio of bedroom area to occupants[42] so that the room becomes cramped.[43] This situation can facilitate the transmission of pathogens that cause ARI.[22]

This study is in line with research of Hidayanti and Darwel (2020) which states that the results of the multivariate analysis are the same, namely occupancy density is related to ARI.[30] This research is supported by research of Ahda (2018) which shows there is a significant relationship between ventilation and the incidence of ARI.[44] Population density that does not meet the requirements increases the risk of ARI greater than that of qualified.[45]

Room occupancy density has an important role in the spread of microorganisms. ARI transmission other than through the air can also be through direct and indirect contact. This study is in line with research of Agungnisa (2019) which shows that room occupancy density is the only physical environmental factor of the house that affects ARI.[46] House construction that does not meet health requirements is a risk factor as a source of transmission of various diseases.[47] Thus, the community needs to consider the area of land used to construct buildings with the number of occupants.[14]

After controlling for other variables, variable that affects the incidence of acute respiratory infections (non-COVID-19) is the use of masks. Where people with inappropriate masks have a 2.320 times greater risk of acute respiratory infection (non-COVID- 19) than people with appropriate masks. This study is in line with research of Rustika and Burase (2018) which states that the results of the multivariate analysis are the same, namely not wearing a mask has a 5 times greater chance of suffering from ARI than wearing a mask.[48]

Based on the results of research interviews conducted, it is known that 15 people sometimes used masks when traveling or outside the home, while 42 people never or sometimes used masks when meeting and talking with ARI sufferers. Having contact with someone who has symptoms of respiratory disease can increase the risk of getting an ARI. This is because ARI disease is transmitted through splashes from infected people [28].

To reduce transmission it is necessary to identify certain elements related to the effectiveness of masks, such as the constant use of masks and the time of maximum use. Inadequate use of masks can increase the risk of infection, masks must be used continuously as it is known that transmission often occurs when there is no protection.[49] In addition, to reducing a person's risk of being exposed to dust directly, it can be done by using a mask when outside the house and interacting with the outside environment.[50] Obedience and strict adherence to the use of masks as a component of PPE have proven to be effective without incident transmission[51] and disease spread.[52] Using a mask can also reduce the transmission of exhaled aerosols to the immediate environment.[53]

From the results of multivariate analysis, $p>0.05$, means that after controlling for other variables there is no effect between handwashing habits and the incidence of acute respiratory infections (non-COVID-19). This research is in line with research of Dagne (2020). This may be because self-reported handwashing practices range from simple cleaning to the level of duration and recommended hand washing methods.[54]

Based on the bivariate analysis in this study, hand washing habits were associated with acute respiratory infections (non-COVID-19). The difference in the results of this study was due to the habit of washing hands which was not the direct cause and the only risk factor for ARI. Hand washing is an important factor in spreading diseases such as ARI.[55]

Upper respiratory tract infections can be transmitted through polluted air, and germs enter the body through the respiratory tract. One way to prevent ARI is to maintain personal and environmental hygiene. Personal hygiene can be done by washing hands with soap while environmental hygiene is done by paying attention to the physical environment of the patient's residence.[56] Hand washing is important after activities outside the home because the hands are the part of the body that is most contaminated with dirt and germs. Bacteria and viruses in the external

environment can stick to hands when holding toys, holding doorknobs, and shaking hands with other people.[57] Hand washing is the easiest, cheapest, most effective, and most important method of preventing the spread of disease, especially during a global pandemic.[58]

Conclusion

Based on the analysis, the use of masks, smoking habits, hand washing habits, room occupancy density, and house ventilation area were related to the incidence of acute upper respiratory tract infections (non-COVID-19). After controlling for confounding variables, the risk factors that affect the incidence of acute upper respiratory tract infections (non-COVID-19) in order of priority were smoking habits, inappropriate house ventilation area, high room occupancy density, and the inappropriate use of masks. Suggestions that can be given are the prevention of acute respiratory infections (non-COVID-19) by improving healthy behavior and improving environmental conditions home physical.

Ethics approval

This study was approved by the Semarang State University Health Research Ethics Commission (Number: 420/KEPK/EC/2021). I did research with the agreement participants who completed the study. Participation in this study was voluntary, and the participant's information is kept confidential. I provided informed consent before filling out the questionnaire.

Availability of data and materials

Not applicable

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Author Contribution

RN designed and wrote the manuscript. MA helped to review the manuscript.

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