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Physical Environmental Factors of The House and Smoking Habit on Acute Respiratory Infections in Toddlers 0-5 years in Buliang District Batam City

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ABSTRACT

Acute Respiratory Infection (ARI) is an infection that occurs in the respiratory tract, both the upper and lower respiratory tract. This study aims to determine the relationship between physical home environment factors and smoking habits on ARI complaints in toddlers in Buliang, Batam City. The type of research used is quantitative with a cross-sectional research design. The sample in this study were mothers who had children aged 0-5 years. The sampling technique used was accidental sampling. The results of the chi-square test analysis showed that there was a relationship between room humidity and ARI complaints in toddlers (ρ-value = 0.000), there is no room lighting with ARI complaints in toddlers (ρ -value = 0.207), wall conditions and ARI complaints in toddlers (ρ -value = 0.037), smoking habits with ARI complaints in toddlers (p-value = 0.017) and there is no relationship between floor conditions and ARI complaints in toddlers (ρ-value = 0.121), ceiling condition with ARI complaints in toddlers (ρ -value = 0.906).

Introduction

According to data gathered from the World Health Organization (WHO), tuberculosis continues to rank among the top ten causes of mortality worldwide, with an estimated 1.3 million patients dying from the disease each year (Sidabutar, Wahyanto, & Jafar, 2024). Globally, there were 6.4 million new cases of tuberculosis or 64% of the 10.0 million cases that were reported annually (Pasaribu, Santosa, Kumala, Nurmaini, & Hasan, 2021). Naturally, this exacerbates the global tuberculosis (TB) crisis, wherein more people contract the disease and a growing percentage of them are incurable (RI Ministry of Health, 2020).

Infectious diseases of the upper or lower respiratory tract that can result in mild to lethal contamination are understood as acute respiratory infections (ARI). Data according to the Indonesian Health Profile, for ARI disease is the third highest order (Raenti, Gunawan, & Subagiyo, 2019). East Java province is the province with the highest

prevalence of ARI of 50% and for North Sulawesi province it is the Province with the lowest prevalence of 4.4%. (RI Ministry of Health, 2022).

According to the statistics of the Batam City Health Service in 2022, ARI cases were 5,529, in 2021 there was a decrease in ARI cases by 4,762 and in 2022 there was a relevant increase of 6,396 cases of ARI (Profil Dinas Kesehatan, 2022).

According to statistics from the Batam City Health Service, for the three highest ARI illnesses there are on Puskesmas Sei Langkai as many as 2.555 news, Stone Aji news as much as 2.311 news and Baloi Permai news 1.650 news (Health service Profile, 2022).

Based on the quantity obtained from Puskesmas Batu Aji related to ARI disease in news for the last 3 years, the difference between the decline in the increase of cases per year is in 2020 the number of people affected by ARI was 1.042 news, in 2021 has an increase of 2.363 news and in 2022 has a decline of 2.311 (Secondary Data, 2022).

ARI disease in toddlers is the first disease in the Batu Aji Community Health Center. There are 2 sub-districts in the working area of the Batu Aji Community Health Center, namely Kibing Village with several 4,665 toddlers, Buliang Village with 6,141 toddlers and Bukit Tempayan Village with a total of 2,598 toddlers (Secondary Data, 2022).

From the results of observations and interviews, it was found that several houses did not have ventilation, walls were covered with wood or zinc, there was a lack of lighting in the house, especially sunlight, the condition of the floors were plastered, dusty walls in the corners of the rooms and wrong habits (Lubis & Ferusgel, 2019). One family who smoked while inside the house resulted in mild ARI complaints in toddlers such as coughs, colds and fever (Bachtiar, 2018).

The relationship between the environment and humidity is that if the humidity in a room is not optimal, it will cause the proliferation of bacteria or viruses causing ARI diseases, including the lighting in the house (Ariano et al., 2019).

Therefore, people are encouraged to pay attention to and maintain the physical environment of their homes, and apply healthy and clean living habits to avoid the risk of contracting infectious diseases such as ARI.

From the statistical results above, the researchers intend to research because cases of ARI in toddlers at the Batu Aji Community Health Center are relatively high and the percentage of the physical environment of the home is still below the desired target. Supported by previous research regarding the incidence of ARI, but not many have researched the physical environmental factors of the home on ARI complaints. This study aims to determine the relationship between physical home environment factors and smoking habits on ARI complaints in toddlers in Buliang, Batam City.

Research Methods

This research is a type of quantitative research with a cross-sectional approach (Hamid & Prasetyowati, 2021). The location of this research is Buliang Village, Batam City. This research began in March-July 2023 from research planning, and research implementation, to writing research reports. The population in this study was 2.206

toddlers. The sampling technique used is the approach of accidental sampling (Sugiyono, 2019).

Quantitative data is the type of data used in this research. Regarding physical environmental factors at home and smoking habits of family members on ARI in toddlers, this information was collected through interviews using questionnaires and direct observation. The analysis used in this research is univariate analysis which includes: room humidity, room lighting, house floor condition, house wall condition, house ceiling condition, members' smoking habits, and ARI complaints. As well as bivariate analysis which determines whether there is a relationship between the independent factors and the dependent variable. The Chi-Square test was used in the bivariate analysis of this study. A computer program is used to carry out the chi-square test, at a 95% confidence level with a p-value ≤ 0.05 (Notoatmodjo, 2005).

Results and Discussion

This section should provide all results of the study briefly which makes the reader easy to understand. It could be divided into subsections to explain separately.

Respondent Characteristics

Table 1
Frequency of Toddler (n=83)

Age	n	%
3 Months	1	1.2
4 Months	3	3.6
5 Months	2	2.4
6 Months	1	1.2
7 Months	1	1.2
8 Months	2	2.4
10 Months	1	1.2
1 Year	8	9.6
2 Years	9	10.8
3 Years	15	18.1
4 Years	18	21.7
5 Years	22	26.5

The results of Table 1. describe that of the 83 toddlers sampled, 1 toddler (1.2%) was 3 months old, 3 toddlers (3.6%) were 4 months old, 2 toddlers (2.4%) were 5 months old, 1 toddler (1.2%) was 6 months old. months, 1 toddler (1.2%) aged 7 months, 2 toddlers (2.4%) aged 8 months, 1 toddler (1.2%) aged 10 months, 8 toddlers (9.6%) aged 1 year, 9 toddlers (10.8%) aged 2 years, 15 toddlers (18.1%) were 3 years old, 18 toddlers (21.7%) were 4 years old and 22 toddlers (26.5%) were 5 years old.

Toddler Gender Frequency

Table 2
Toddler Gender (n=83)

Gender	n	%
Boy	45	54.2
Girls	38	45.8

The results of Table 2 describe that of the 83 toddlers sampled, 45 toddlers (54.2%) were boys and 38 toddlers (45.8) were girls.

Analysis Univariate

Table 3
Variable Studied (n=83)

Variable	n	%
House Humidity		
Qualify	55	66.3
Not Eligible	28	33.7
House Lighting		
Qualify	53	63.9
Not Eligible	30	36.1
Floor Condition		
Qualify	55	66.3
Not Eligible	28	33.7
House Wall		
Qualify	71	85.5
Not Eligible	12	14.5
House Ceiling		
Qualify	54	65.1
Not Eligible	29	34.9
Smoking Habit		
Yes	54	65.1
No	29	34.9
Incidence of ARI		
Have of ARI Complaints	54	65.1
Did not Have ARI Complaints	29	34.9

Based on Table 3, shows that for the humidity variable, the majority of respondents had house humidity that met the requirements, namely 55 people (66.3%) and respondents who had house humidity that did not meet the requirements, namely 28 people (33.7%). House lighting variables: the majority of respondents had house lighting that met the requirements, namely 53 people (63.3%) and respondents who had house lighting that did not meet the requirements, namely 30 people (36.1%). For the floor condition variable, the majority of respondents had floor conditions that met the requirements, namely 55 people (66.3%) and 28 respondents who had floor conditions that did not meet the requirements (33.7%). The house wall condition variable was that most of the respondents had house wall conditions that met the requirements, 71 people (85.5%) and 12 people (14.5%) did not meet the requirements (Dongky & Kadrianti, 2016). In the house ceiling condition variable, 54 people (65.1%) met the requirements and 29 people (34.9%) did not meet the requirements. The smoking habit variable was that mostly 54 people (65.1%) smoked and 29 people (34.9%) did not smoke. And in the ARI incidence variable, the majority of respondents have ARI complaints, 54 people (65.1%) and those who did not have ARI complaints, 29 people (34.9%).

Table 4
Physical Environmental Factors of The House and Smoking Habit on Acute Respiratory Infections in Toddlers 0-5 years in Buliang District Batam City

Variable	Incidence of ARI				Total	
	Have of ARI Complaints		Did not Have of ARI Complaints			
	n	%	n	%	n	%
House Humidity						
Qualify	20	71.4	8	28.6	28	100
Not Eligible	5	9.1	50	90.9	55	100
Chi-Square Test, Score ρ = 0.000						
House Lighting						
Qualify	6	20.0	24	80.0	30	100
Not Eligible	19	35.8	34	64.2	53	100
Chi-Square Test, Score ρ = 0.207						
Floor Condition						
Qualify	12	42.9	16	57.1	28	100
Not Eligible	13	23.6	42	76.4	55	100
Chi-Square Test, Score ρ = 0.121						
House Wall						
Qualify	7	58.3	5	41.7	12	100
Not Eligible	18	25.4	53	74.6	71	100
Chi-Square Test, Score ρ = 0.037						
House Ceiling						
Qualify	8	27.6	21	72.4	29	100
Not Eligible	17	31.5	37	68.5	54	100
Chi-Square Test, Score ρ = 0.906						
Smoking Habit						
Yes	11	20.4	43	79.6	54	100
No	14	48.3	15	51.7	29	100
Chi-Square Test, Score ρ = 0.017						

Based on Table 4, the results of the chi-square test analysis show that the house humidity variable shows ρ (0.000) < α (0.05), meaning that there is a relationship between house humidity and the incidence of ARI. The house lighting variable shows ρ (0.207) > α (0.05), meaning that there is no relationship between house lighting and the incidence of ARI events (Suryani, Edison, & Nazar, 2015). The variable condition of the house floor shows ρ (0.121)> α (0.05), meaning that there is no relationship between the condition of the house floor and the incidence of ARI. The variable condition of the house walls shows ρ (0.037) < α (0.05), meaning that there is no relationship between the condition of the house walls and the incidence of ARI. The variable condition of the house ceiling shows ρ (0.906) > α (0.05), meaning that there is no relationship between the

condition of the house ceiling and the incidence of ARI. The smoking habit variable shows ρ (0.017) < α (0.05), meaning that there is a relationship between smoking habit and the incidence of ARI.

The results of the chi-square test analysis show that the house humidity variable shows ρ (0.000) < α (0.05), meaning that there is a relationship between house humidity and the incidence of ARI. Humid house conditions are usually caused by lack of ventilation and lack of light entering the house. So viruses and germs will easily live and reproduce in the house and the people who live in the house will easily get ARI.

The house lighting variable shows ρ (0.207) > α (0.05), meaning that there is no relationship between house lighting and the incidence of ARI events. Lighting for the entire room has a minimum intensity of 60 Lux and is not dazzling based on the Regulation of the Minister of Health of the Republic of Indonesia Number 2 of 2023. If the lighting is <60 lux in the room then bacteria and other microorganisms can live well, conversely if the lighting in the room is ≥ 60 lux it can inhibit the growth of bacteria and other microorganisms in the room.

The variable condition of the house floor shows ρ (0.121)> α (0.05), meaning that there is no relationship between the condition of the house floor and the incidence of ARI. A waterproof floor made of ceramic so that it does not increase the humidity in the house. Floors that are not damp can also prevent the emergence of disease-carrying vectors such as cockroaches or mice. The condition of the floor which is cleaned frequently is free from dust or dirt so that it cannot interfere with the respiratory tract when breathing.

The variable condition of the house walls shows ρ (0.037) < α (0.05), meaning that there is no relationship between the condition of the house walls and the incidence of ARI. The type of wall affects the occurrence of ARI because the walls are difficult to clean It causes a buildup of dust, so it will be used as a good medium for the growth of germs. A good wall is made of plastered walls in good condition.

The variable condition of the house ceiling shows ρ (0.906) > α (0.05), meaning that there is no relationship between the condition of the house ceiling and the incidence of ARI. The condition of the house ceiling meets the specified standards, namely the ceiling of the house is a ceiling. Because if the ceiling of the house does not have a ceiling covering, it can cause ISPA agents to be more easily infected by toddlers. If there is no ceiling, dirt or dust from the roof of the house will fall directly into the house, which will cause respiratory problems.

The smoking habit variable shows ρ (0.017) < α (0.05), meaning that there is a relationship between smoking habit and the incidence of ARI. Cigarette smoke is not only a direct cause of ISPA complaints in toddlers but is an indirect factor that can weaken toddlers' immune systems. Continuous exposure will cause respiratory problems, especially aggravating the onset of ISPA. The more cigarettes a family smokes, the greater the risk of ARI. Therefore, it is hoped that respondents will not smoke at home and not smoke around toddlers.

Conclusion

The results of the study showed several important findings regarding the physical environment of the house and its relationship with complaints of acute respiratory tract infection (ARI) in toddlers. Most of the respondents indicated that the humidity of the house was qualified, with 55 respondents (66.3%), lighting was qualified with 53 respondents (63.9%), floor condition was qualified with 55 respondents (66.3%), wall condition was qualified with 71 respondents (85.5%), and house ceiling condition was qualified with 54 respondents (65.1%).

In the description of family members who smoke, the majority of respondents were known to smoke, namely 54 respondents (65.1%). Regarding ARI complaints in toddlers, the majority of toddlers did not experience ARI complaints, namely 58 toddlers (69.9%). The results of the chi-square test showed a relationship between humidity and ARI complaints, with a value of $p = 0.000$. In addition, the results of the chi-square test also showed a relationship between the condition of the wall and ARI complaints, with a value of $p = 0.037$. Finally, the results of the chi-square test showed a relationship between family members who smoke and ARI complaints, with a value of $p = 0.017$.

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