The Association Between the Physical State of Homes and PHBS and the Prevalence of Pulmonary Tuberculosis in the Lubuk Buaya Health Center's Working Area in Padang City

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ABSTRACT

Globally, TB cases are reported at 90%, with 58% in men and 32% in women. In addition, TB cases in children amount to 10% (Global Tuberculosis Report 2021). In 2021, the Padang City Health Office recorded 1,199 cases of tuberculosis, with Lubuk Buaya having the most cases with 52 cases in 2022. The general objective of this study was to determine how the incidence of pulmonary tuberculosis in Lubuk Buaya urban village, Padang City, correlates with the physical condition of the house and clean and healthy living behavior. This study was a descriptive analytical study using quantitative methods; the study population was 27 people suffering from tuberculosis, with 27 case and 27 control samples. The results showed that there were 50 positive TB cases, humidity met the requirements 46.3%, ventilation met the requirements 51.9%, lighting met the requirements 61.1%, and good PHBS 33.3%. According to the bivariate value of the chi square test, the p value of humidity $(0.029 < OR = 4.038)$, ventilation $(0.014 < OR = 4.750)$, lighting $(0.026 < OR = 4.375)$, and PHBS $(0.009 < OR = 6.129)$. The findings and discussion demonstrate the relationship between PHBS, humidity, ventilation, illumination, and occupancy density and tuberculosis cases. It is advised that the Lubuk Buaya Community Health Center and the Padang City Health Office increase community awareness of tuberculosis prevention. They should provide instructions on healthy homes and the implementation of community-based total sanitation. To stop the chain of tuberculosis spread, the community is asked to establish healthy houses.

Keywords: Physical Condition, Clean and Healthy Living Behavior, Tuberculosis

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INTRODUCTION

Indonesia has the third highest number of TB cases in the world, according to the WHO Global Tuberculosis 2021 report. In 2020, it is estimated that there will be 824 thousand new cases of TB, with a death rate reaching 93 thousand cases, or 11 deaths per hour. Globally, TB cases are reported at 90%, with 58% in men and 32% in women. Apart from that, TB cases in children are 10% (Global Tuberculosis Report 2021).

In Indonesia, every year there are 250,000 new TB cases and 100,000 deaths. TB is the number one cause of death among infectious diseases and occupies the third place as a cause of death at all ages after cardiovascular disease and acute respiratory infections. In 2020, there were 165,116 cases of tuberculosis in Indonesia, according to health profile data collected.

In 2020, the Indonesian Health Profile found 5,399 cases of tuberculosis in West Sumatra. Data obtained from the Padang city health office in 2021 showed 1,199 cases of tuberculosis, with the city of Padang having the most TB cases. According to the 2021 Lubuk Buaya community health center's annual report, there were 118 cases of tuberculosis at the Lubuk Buaya community health center. This significant number of cases shows that treatment of tuberculosis must be better (*Indonesian Health Profile*, 2020).

According to a study by Nikemonintja & Finnywarouw (2020), Lestarimuslimah (2019), and Mathefani & Febriyanti (2019), there is a significant correlation between the incidence of pulmonary tuberculosis and the physical condition of the house, such as dense housing, floor type, and insufficient ventilation area. Good. Several studies, including those showing smoking as a cause of pulmonary tuberculosis, such as that by Lalombo et al. (2015) and Ibrahim, 2017 have reached the conclusion that smoking habits have a significant correlation with the prevalence of pulmonary tuberculosis.

According to initial research, the Lubuk Buaya health center working area experienced 52 cases in 2022, spread across four sub-districts: Lubuk Buaya, Parupuak Tabiang, Pasia Nan Tigo, and Batang Kabu Ganting. Lubuk Buaya Village experienced the most cases, with 27 cases. Based on the background description above, this research is "How is the relationship between the physical condition of the house and clean and healthy living behavior with the incidence of pulmonary tuberculosis in Lubuk Buaya Village".

METHODS

This descriptive analytical research uses quantitative methods and uses a case control study design. The independent variables for total sampling are the physical condition of the house and clean and healthy living behavior; the dependent variable is the case of tuberculosis.

This research was conducted in Lubuk Buaya sub-district, Padang City and involved 27 tuberculosis patients and 27 controls. After collecting data through questionnaires, univariate analysis was used to evaluate the frequency distribution of each variable studied. Next, test*chi square* used to identify the relationship between the independent variable and the dependent variable.

The purpose of univariate analysis is to provide an explanation or explanation of the characteristics of each research variable, which is presented in the form of a percentage and

frequency distribution table (Notoatmodjo, 2010). This bivariate analysis is to see the relationship between the independent variable and the dependent variable. The test carried out is a test*chi-square* with a confidence level of 95% with α = 0.05. if p ≤ α it means there is a significant relationship between the independent variable and the dependent variable and if p ≥ α it means there is no relationship between the independent variable and the dependent variable.

RESULT

1. Univariate Analysis

a. Frequency Distribution of TB Events

Table 1. Frequency Distribution of TB Incidents in the Lubuk Buaya Health Center Working Area, Padang City

The incidence of TB	Frequency (f)	%
Positive	27	50.0
TB negative	27	50.0
Total	**54**	**100.0**

b. Humidity

Table 2. Frequency Distribution of House Humidity in the Lubuk Buaya Health Center Working Area, Padang City

Humidity	Frequency (f)	%
Did not fulfil the conditions	29	53.7
Qualify	25	46.3
Total	**54**	**100.0**

c. Ventilation

Table 3. Frequency Distribution of House Ventilation in the Lubuk Buaya Health Center Working Area, Padang City

Ventilation	Frequency (f)	%
Did not fulfil the conditions	26	48.1
Qualify	28	51.9
Total	54	100.0

d. Lighting

Table 4. Frequency Distribution of House Lighting in the Lubuk Buaya Health Center Working Area, Padang City

Lighting	Frequency (f)	%
Did not fulfil the conditions	21	38.9
Qualify	33	61.1

Total	54	100.0

e. **PHBS**

Table 6. PHBS Frequency Distribution in the Lubuk Buaya Health Center Working Area, Padang City

PHBS	Frequency (f)	%
Not good	36	66.7
Good	18	33.3
Total	54	100.0

2. **Bivariate Analysis**

a. **The Relationship Between House Humidity and the Incidence of TB in the Lubuk Buaya Health Center Working Area, Padang City**

Table 7. The Relationship Between House Humidity and the Incidence of TB in the Lubuk Buaya Health Center Working Area, Padang City

Humidity	The incidence of TB						P Value	OR CI 95%
	Case		Control		Total			
	n	%	n	%	N	%		
Did not fulfil the conditions	19	70.4	10	37.0	29	100		
Qualify	8	29.6	17	63.0	25	100	0,029	4,038 (1,295 – 12,585)
Amount	27	100	27	100	54	100		

b. **The Relationship Between House Ventilation and the Incidence of TB in the Lubuk Buaya Health Center Working Area, Padang City**

Table 8. The relationship between house ventilation and the incidence of TB in the Lubuk Buaya Health Center Working Area, Padang City

Ventilation	The incidence of TB						P Value	OR CI 95%
	Case		Control		Total			
	n	%	n	%	N	%		
Did not fulfil the conditions	18	66.7	8	29.6	26	100		
Qualify	9	33.3	19	70.4	27	100	0,014	4.750(1.504-15.002)
Amount	27	100	27	100	54	100		

c. **The Relationship Between House Lighting and the Incidence of TB in the Lubuk Buaya Health Center Working Area, Padang City**

Table 9. The Relationship Between Home Lighting and the Incidence of TB in the Lubuk Buaya Health Center Working Area, Padang City

Lighting	The incidence of TB						P Value	OR CI 95%
	Case		Control		Total			
	n	%	n	%	N	%		
Did not fulfil the conditions	15	55.6	6	38.9	21	100		
Qualify	12	44.4	21	77.8	33	100	0,026	4.375 (1.340-14.280)
Amount	27	100	27	100	54	100		

d. **The Relationship Between PHBS and the Incidence of TB in the Lubuk Buaya Health Center Working Area, Padang City**

Table 10. The Relationship Between PHBS and the Incidence of TB in the Lubuk Buaya Health Center Working Area, Padang City

PHBS	The incidence of TB						P Value	OR CI 95%
	Case		Control		Total			
	n	%	n	%	N	%		
Not good	23	85.2	13	48.1	36	100		
Good	4	14.8	14	51.9	18	100	0,009	6.129 (1.683-22.785)
Amount	27	100	27	100	54	100		

DISCUSSION

1. Humidity

With a value of p=0.000 or p<0.005, the results of research using chi-square on the humidity variable show a significant relationship. This is due to the fact that the percentage of TB cases whose home humidity does not meet the requirements is 70.4%, home humidity does not meet the requirements 37.0%, home humidity meets the requirements 29.6%, and control status who do not suffer from TB get home humidity that meets the requirements 63.0%, respectively each with OR = 4.038, which shows that respondents whose house humidity does not meet the requirements have four times the chance of getting a positive TB result.

The results of this study are in line with previous research (Majuntu et al., 2015) which stated that 65 houses (75.6%) had humidity levels that did not meet the requirements, with results measuring indoor humidity between 40 and 70 percent. 21 houses (24.4%) had humidity levels that met the requirements.

From the results of this study, researchers assume that house humidity that does not meet the requirements is significantly correlated with the incidence of TB. This shows the importance of

environmental factors in the spread of disease. Although the correlation relationship does not indicate causation, the results provide a basis for further consideration regarding preventive measures to control TB, including preventive measures and improving quality in the home. In the research there are several limitations, including limitations in data collection and statistical analysis. In addition, other factors that can influence the incidence of TB, such as a history of exposure to active TB patients, also need to be considered in future research.

2. **Ventilation**

The results of statistical analysis for house ventilation using the Chi Square test produce a probability value of p-value = 0.014. These results show that the 18 TB cases that received home ventilation did not meet the requirements, namely 18 respondents (66.7%), and the control status of the 27 TB cases that were not suffered did not meet the requirements, namely 8 respondents (29.6%), and 27 TB cases that were It was found that house ventilation met the requirements, namely 27 cases.

Another study (Nuraini, 2015) found that inadequate ventilation in houses with a floor area of less than 10% will increase indoor humidity due to evaporation and absorption of fluids from the skin. This finding contradicts the findings of this study. High room humidity is a place for pathogenic bacteria such as *Mycobacterium tuberculosis* breed.

From the results obtained, researchers assume that inadequate home ventilation can be a significant risk factor in the transmission or incidence of TB. Residents of homes with inadequate ventilation may have a higher risk of contracting TB infection, compared to those living in homes with adequate ventilation. This emphasizes the importance of a healthy home environment in preventing infectious diseases such as TB.

3. **Lighting**

The results of statistical analysis of Home Lighting using the Chi Square test show p-value = 0.026. This shows a relationship between home lighting and pulmonary tuberculosis with a value of OR = 4.375, which means that respondents who have inadequate home lighting are 4 times more likely to suffer from pulmonary tuberculosis.

A study conducted by Singgih Sugiarto (2003:68) in the city of Surakarta found that there was a relationship between lighting and the incidence of pulmonary TB. The p value = 0.00 < 0.05 and OR = 6.2 indicates that respondents with home lighting intensity that does not meet the requirements have a 6.2 greater risk than respondents with home lighting intensity that meets the requirements. These findings have important implications in the clinical and public health fields. Improving home ventilation or improving indoor air quality can be an effective strategy in reducing the risk of TB transmission in the community. Intervention programs aimed at improving home ventilation in areas with high TB prevalence may help reduce the burden of the disease.

Researchers assume these findings show the importance of home lighting in preventing pulmonary tuberculosis. Poor or inadequate lighting in the home can increase the risk of developing Pulmonary Tuberculosis infection. Good lighting in the home can help reduce the spread of TB bacteria and reduce the risk of contracting the disease. The implication of these findings is the need for special attention to home lighting in efforts to prevent pulmonary tuberculosis. Intervention programs aimed at improving home lighting in vulnerable communities can help reduce the burden

of this disease. Apart from that, education about the importance of good home lighting also needs to be improved.

4. PHBS

The results of statistical analysis using the chi-square test on the PHBS variable show that there is a significant influence on events*tuberculosis* where to get the value*p-value* =0.009 (p *value < α)* This means that H_0 is rejected and we get OR = 6.129, which means that respondents who have poor PHBS are 6 times more likely to be positive for TB compared to respondents who have good PHBS.

This research is in line with research proposed by (Lestari, 2017) which states that clean and healthy living behavior has a significant effect on pulmonary TB where the test results*Chi – square* it can be seen that p= 0.641.

Based on researchers, they assume the importance of PHBS in preventing tuberculosis. Good observation of PHBS can help reduce the risk of contracting TB infection. Behaviors such as regular hand washing, keeping the environment clean, and other sanitation practices can contribute to reducing the spread of TB. The implication of these findings is the importance of public health education campaigns that focus on promoting PHBS, especially in areas with high TB prevalence rates. Intervention steps such as education about the importance of PHBS, building adequate sanitation facilities, and monitoring environmental cleanliness can help reduce the burden of TB disease.

CONCLUSION

This study shows a significant relationship between household humidity and Tuberculosis (TB) cases, with a p-value of 0.029 and an Odds Ratio (OR) of 4.038. This indicates that high indoor humidity may increase the risk of TB transmission. Therefore, intervention efforts aimed at improving indoor air quality, such as controlling humidity levels, could help reduce the risk of TB spread in the community, particularly in the Working Area of Lubuk Buaya Health Center, Padang City.

In addition, the study also found a significant relationship between home ventilation and TB cases, with a p-value of 0.014 and an OR of 4.750. This finding highlights the importance of paying attention to home ventilation conditions as part of TB prevention and control efforts. Measures to improve indoor air circulation, including enhancing ventilation systems, can serve as a key strategy to reduce the burden of TB in the Working Area of Lubuk Buaya Health Center, Padang City.

The study also revealed a significant relationship between home lighting and Pulmonary Tuberculosis, with a p-value of 0.026 and an OR of 4.375. Inadequate lighting in homes may contribute to an increased risk of TB transmission. Therefore, improving lighting conditions in residential areas, especially among vulnerable communities, should be considered an important strategy in the prevention and control of TB in the Working Area of Lubuk Buaya Health Center, Padang City.

Finally, the study found a significant relationship between Clean and Healthy Living Behavior (PHBS) and TB incidence, with a p-value of 0.009 and an OR of 6.129. These findings provide a strong foundation for intervention programs aimed at increasing public awareness and

the adoption of PHBS to reduce the risk of TB transmission. Efforts to improve PHBS should be a top priority in TB prevention and control strategies in the Working Area of Lubuk Buaya Health Center, Padang City.

REFERENCES

Baliasa, W., et al. (2020). Tuberculosis (TB) in 2019. *Jurnal Public Health and Community Medicine*, 1, 63–69.

Central Statistics Agency. (2021). *Statistical Yearbook of Indonesia 2021*. Jakarta: BPS-Statistics Indonesia.

Davies, P. D. (2003). The role of DOTS in tuberculosis treatment and control. *American Journal of Respiratory Medicine*, 2(3), 203–209. https://pubmed.ncbi.nlm.nih.gov/14720025/

Fransiska, T. (2020). *[Thesis] Bachelor of Public Health Study Program, Faculty of Public Health, University of North Sumatra*. Medan: Universitas Sumatera Utara.

Global Tuberculosis Report 2021 – TB DIAH. (2021). https://www.tbdiah.org/resources/publications/global-tuberculosis-report-2021/

Imaduddin, D., Setiani, O., & Suhartono, D. (2019). The relationship between physical conditions of houses and behavior with the incidence of pulmonary TB in the working area of Batu 10 Community Health Center, Tanjungpinang City. *Jurnal Kesehatan Masyarakat (Undip)*, 7. http://ejournal3.undip.ac.id/index.php/jkm

Indonesian Ministry of Health. (2021). *Indonesia Health Profile 2020*. Jakarta: Ministry of Health Republic of Indonesia.

Kristini, T., & Hamidah, R. (2020). Potential for transmission of pulmonary tuberculosis to family members of sufferers. *Jurnal Kesehatan Masyarakat Indonesia*, 15, 24.

Lönnroth, K., Castro, K. G., Chakaya, J. M., Chauhan, L. S., Floyd, K., Glaziou, P., ... & Weyer, K. (2010). Tuberculosis control and elimination 2010–50: cure, care, and social development. *The Lancet*, 375(9728), 1814–1829. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(10)60483-7/fulltext

Ministry of Health Republic of Indonesia. (2016). *Minister of Health Regulation No. 67 of 2016 about Tuberculosis Management*. Jakarta: MoH RI.

Ministry of Health Republic of Indonesia. (2016). *Lung Health Services Pocket Book*. Jakarta: Ministry of Health Republic of Indonesia. https://puskomkemkes.files.wordpress.com/2018/08/buku-saku-paru-fikm-2016-2.pdf

Ministry of Health Republic of Indonesia. (2019). *National Guidelines for Controlling Tuberculosis*. Jakarta: Ministry of Health Republic of Indonesia. https://puskomkemkes.files.wordpress.com/2019/03/pedoman-nasional-penanggulangan-tuberkulosis.pdf

Pangestika, R., Fadli, R. K., & Alnur, R. D. (2019). Education on preventing transmission of TB disease through household contacts. *Jurnal SOLMA*, 8, 229.

Pratiwi, R. D. (2020). Description of tuberculosis complications based on the International Classification of Disease 10 Code. *Jurnal Kesehatan Al-Irsyad*, 13, 93–101.
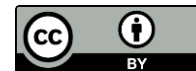
Ramadhan, N., et al. (2021). Behavior to prevent the transmission of pulmonary tuberculosis in TB sufferers in the cities of Banda Aceh and Aceh Besar. *Research Media: Developer Health*, 1, 51–62.

Richter, L. M., Lönnroth, K., Desmond, C., Jackson, R., Jaramillo, E., & Weil, D. (2017). Economic support to patients in HIV and TB grants in Rounds 7 and 10 from the Global Fund to Fight AIDS, Tuberculosis and Malaria. *Tropical Medicine & International Health*, 22(3), 336–343. https://pubmed.ncbi.nlm.nih.gov/27910228/

World Health Organization. (2019). *Global Tuberculosis Report 2019*. Geneva: WHO. https://iris.who.int/handle/10665/346387