The Relations Between Houses Physical Condition Between Tuberculosis Cases In The Working Area Of Sikumana Health Center Community In 2018

Albina Bare Telan
Department of Environmental Health, Health Polytechnic of Kupang
Email: baretelanalbina@gmail.com

Abstract

Background: Houses are one of the basic human needs besides clothing and shelter, so the house must be healthy so that its residents can work productively. A healthy home must meet several requirements, namely meeting physiological needs, psychology, preventing accidents and preventing transmission of disease. Unhealthy home conditions are a risk factor for breeding or as a transmission of various diseases, such as tuberculosis (TB). Tuberculosis is a contagious infectious disease caused by mycobacterium tuberculosis which attacks various organs, especially the lungs. Aim: Describe the physical condition of a patient’s home tuberculosis in the work area of Sikumana Health Center in 2018. Results: The results showed that the average humidity measurement fulfilled the requirements of 50 houses (100%), the temperature did not meet the requirements of 49 houses (98%), the ventilation area fulfilled the requirements of 45 houses (90%), the density of occupancy qualified 42 houses (84%), the intensity of lighting does not meet the requirements of 23 houses (46%) and the type of floor meets the requirements of 49 houses (98%). Conclusion: It was concluded that the physical condition of home health that fulfilled the requirements included humidity, ventilation area, occupancy density and type of house floor while the health condition of the house that did not meet the requirements was the temperature and intensity of the lighting. Additional lighting is needed in the house and always open the window every day so that air circulation becomes smooth.

Keywords: Physical condition of the house, Incidence of tuberculosis.

*Correspondence: baretelanalbina@gmail.com
Present Address: Piet A. Tallo St. Liliba - Indonesia

©The Author(s) 2018. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/zero/1.0/) applies to the data made available in this article, unless otherwise stated.
INTRODUCTION

House is one of the basic human needs in addition to clothing and shelter, so the house must be healthy so that its residents can work productively. A healthy home must meet several requirements, namely meeting physiological needs, psychology, preventing accidents and preventing transmission of disease. Unhealthy home conditions are a risk factor for breeding or as a transmission of various diseases, such as tuberculosis (TB). Tuberculosis is a contagious infectious disease caused by *mycobacterium tuberculosis* which attacks various organs, especially the lungs. The source of transmission is patients with positive acid-resistant Basil tuberculosis (BTA positive) through the sputum sputum that is released.

Indonesia is a country with the second largest number of new cases in the world after India, amounting to 60% of new cases. Tuberculosis deaths are estimated at 1.4 million deaths plus 0.4 million tuberculosis deaths in people with HIV. Although the number of deaths from tuberculosis decreased by 22% between 2000 and 2015, tuberculosis remained the 10th highest cause of death in the world in 2015 (Indonesian Health Profile, 2016).

TB in East Nusa Tenggara is still high, although various methods of tackling TB disease continue to be promoted, for example with DOT’S, TOSS and programs that are being promoted now are the Door Knock Movement, where in 2017 the movement found 200 new cases spread over several districts. The city of Kupang is the biggest contributor to TB cases, where the trend of the trend is increasing in the last 3 years, from 315 cases, in 2016 to 342 cases and up to 700 cases in 2017.cases

Most of the TB in Kupang in 2016 were attacked ages 15 to 24 years with 199 cases and 25 to 34 years old totaled 167 sufferers. (Kupang City Health Office). An increase in tuberculosis cases can be influenced by several factors, including the physical condition of the home environment. The quality of the physical environment of an unhealthy house plays an important role in the transmission and proliferation of *Mycobacterium tuberculosis*. The lack of light entering the house, poor ventilation
tends to create a moist and dark atmosphere, this condition causes germs to last for days to months in the house.

PURPOSE

General objective to find out the description of the physical condition of the patients with tuberculosis in the work area of Sikumana Community Health Center in 2018. Specific objectives:

a. Measure the humidity in the homes of patients with tuberculosis in the work area of Sikumana Health Center.
b. Measuring the temperature of a patient tuberculosis in the work area of the Sikumana Community Health Center.
c. Measuring ventilation area in patients tuberculosis in the work area of Sikumana Health Center.
d. Calculate home occupancy density in the home patients tuberculosis in the work area of Sikumana Health Center.
e. Measuring the intensity of lighting in the home patients tuberculosis in the work area of Sikumana Health Center.
f. Determine the type of house floor in the home patients tuberculosis in the work area of Sikumana Health Center.

METHOD

The type of descriptive survey research, the sample in this study was that all the homes of tuberculosis patients numbered 50 patients. The data collection technique is done by using a tool: Thermohigrometer to measure temperature and humidity, Lux meter to measure the level of lighting of a room, ROLmeter to measure the ventilation area and area of the room.

RESULTS AND DISCUSSION

1. The Respondent’s General Description

The results of the univariate analysis obtained data as follows: Respondents were male as many as 24 people (48%), and female sex as many as 26 people (52%). The lowest age is 4 years and the highest age is 61 years.

2. Research Results The

a. Moisture
Results of humidity measurements in TBC patients' homes in the Sikumana Community Health Center work area as shown in the following:

Table 1

Results of Measurement of Humidity at Home for TB Patients in the Work Area of Sikumana Community Health Center in Mulafa City Kupang District in 2018

<table>
<thead>
<tr>
<th>Humidity (%)</th>
<th>n</th>
<th>%</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>40% - 70%</td>
<td>50</td>
<td>100</td>
<td>MS</td>
</tr>
<tr>
<td>&lt;40%</td>
<td>-</td>
<td>-</td>
<td>TMS</td>
</tr>
<tr>
<td>&gt; 70%</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 above shows that the level of humidity in the homes of TB patients with an average criteria meets as many as 50 houses (100%).

b. Temperature

Results of temperature measurements in TBC patients' homes in the Sikumana Community Health Center work area as shown in the following:

Table 2

Results of Temperature Measurement at Home for TB Patients in the Working Area in Pusumana Community Health Center Maulafa City Kupang Year 2018

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>n</th>
<th>%</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 30 °C</td>
<td>1</td>
<td>2</td>
<td>MS</td>
</tr>
<tr>
<td>&lt;18 °C</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt; 30 °C</td>
<td>49</td>
<td>98</td>
<td>TMS</td>
</tr>
<tr>
<td>Amount</td>
<td>50</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 2, the results of temperature measurements at home of temperature TB patients who meet the requirements of 1 house (2%) and the temperature does not meet the requirements 49 houses (98%).
c. Ventilation area

Extensive ventilation results in TBC patients’ homes in the Sikumana Community Health Center work area as shown in the following:

Table 3

Results of Ventilation Area Measurement in Most TB Patients in the Sikumna Community Health Center Working Area in North Maluku City in 2018

<table>
<thead>
<tr>
<th>Ventilation Area</th>
<th>n</th>
<th>%</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 10% of floor area</td>
<td>45</td>
<td>90</td>
<td>MS</td>
</tr>
<tr>
<td>&lt;10% of the floor area</td>
<td>5</td>
<td>10</td>
<td>TMS</td>
</tr>
</tbody>
</table>

Table 3 above shows that the ventilation area that meets the requirements is 45 houses (90%) and does not meet the requirements of 5 houses (10%).

d. Occupancy Density

Measurement results of occupancy density in TBC patients’ homes in the work area of Sikumana Community Health Center as shown in the following:

Table 4

Results of Measurement of Residential Occupancy at Home for TB Patients in the Work Area of Sikumna Community Health Center in Mawulul in 2018

<table>
<thead>
<tr>
<th>Occupancy Density (8m² / person)</th>
<th>n</th>
<th>%</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 m² / person</td>
<td>42</td>
<td>84</td>
<td>MS</td>
</tr>
<tr>
<td>&lt;8 m² / person</td>
<td>8</td>
<td>16</td>
<td>TMS</td>
</tr>
</tbody>
</table>

Based on table 4 shows that the occupancy density that meets the requirements is 42 houses (84%) and does not meet the requirements of 8 houses (16%).

e. Lighting

The home lighting measurement results of tuberculosis patients in Sikumana Public Health as shown in Table 5 below:
Table 5
Results of Measurement Lighting Residential TB Patients In Sikumana Public Health Maulafa 2018

<table>
<thead>
<tr>
<th>Illumination (Lux)</th>
<th>n%</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-60 lux</td>
<td>27</td>
<td>54</td>
</tr>
<tr>
<td>&lt;50</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>&gt; 60 lux</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Amount</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5 shows the results of lighting measurements met the requirements of 27 houses (54%) and those that did not meet the requirements <50 lux and > 60 lux totaling 18 houses (36%), and 5 houses (10%).

f. Types of Floor

Results of floor type assessment in TBC patients’ homes in the Sikumana Community Health Center work area as shown in the following:

Table 6
Results of Assessment of Types of House Floors at TBC Patients’ Homes in Sikumana Community Health Center Working Area in Mawulafa District 2018

<table>
<thead>
<tr>
<th>Floor Types</th>
<th>n</th>
<th>%</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>1</td>
<td>2</td>
<td>TMS</td>
</tr>
<tr>
<td>Rough floors</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Ceramics / cement</td>
<td>49</td>
<td>98</td>
<td>MS</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 6, the type of tile floor is 49 houses (98%) and 1 floor of the house floor (2%).

**DISCUSSION**

1. **Characteristics of Respondents**

   Based on the sex of the most patients were 26 women (52%), while the highest age group of respondents was 46 – 55
years, amounting to 18 people (36%). Age factor is associated with risk and immunity where the age group of the early elderly (46-55 years) is also an age group that is susceptible to infection with TB transmission because at this age the majority of people spend time and energy working, where energy is depleted and rest periods decrease so that the body’s resistance decreases. While gender also has to do with genetic theory which mentions the structure of differences in male and female genes that can cause a response to the disease.\(^5\)

2. Measurement Results

Based on the results of research on measured variables it turns out there are still variables that do not meet health requirements In accordance with the established standards, the temperature variables of 50 houses measured by temperature measurements did not meet the requirements of 49 houses (98%) with temperatures above 30 °C, while the optimum indoor temperature was 18°C - 30°C. This is because changes in the ambient temperature in Kupang City are very extreme and sufferers’ houses are located in very dense settlements, the behavior of opening windows is still lacking, there are houses that do not have ventilation, there are no trees around so that air movement is less causing the temperature in the house to become hot.

Changes in temperature around a few degrees can affect body function. For example, body temperature decreases 3 degrees Celsius to 35 degrees Celsius due to low ambient temperature, so people will experience mild hypothermia. Hypothermia the weight can even cause heart attacks, strokes and death. While at temperatures that are too high, it can cause brain damage. Therefore, when the body senses the temperature difference between the temperature in the environment and the temperature in the body, the body will automatically conduct thermoregulation, which is a process of body adaptation in accepting changes in temperature that occur around it.

The air temperature in a room that is too hot or too cold will also have an effect on the transmission of disease. The optimal temperature of bacterial growth varies greatly. According to Gould and
Brooker (2003) states that the bacterium *Mycobacterium tuberculosis* is a mesophilic bacterium that can live at temperatures of 10-40 °C, so *Mycobacterium tuberculosis* is able to grow optimally at 37 °C and survive in a dark place so that more bacteria are reproduced in dark houses. Some studies confirm that air temperature can be one of the causes (risk factors) of pulmonary TB, as research conducted by Fatima (2008) states that there is a relationship between the incidence of pulmonary TB with temperature (OR 2.674), then Atmosukarto (2000) who conducts research about the influence of the residential environment with the incidence of pulmonary TB found that room temperature has an influence on the incidence of pulmonary TB (OR 5.126). This shows that individuals who have homes with temperatures <18 °C or >30 °C have a risk of 2.7 pulmonary TB and 5.1 times compared to the temperature of 18-30 °C which is the ideal temperature or optimum.

The incidence of tuberculosis is the result of interaction between environmental components, namely air containing TB bacillus, with the community and influenced by various risk factors that play a role in the occurrence of disease events. Several factors are known to be associated with the occurrence of tuberculosis including smoking, drinking alcohol, drug users, malnutrition, air and poor ventilation, contact closeness, BCG vaccination status, duration of contact and minimal sunlight entering the home, people with HIV infection, socio-economics, improper drug dosage or drop out taking medication. Therefore it is necessary to handle these risk factors maximally so that TB can be completed.

**CONCLUSION**

Based on the results of the study it was concluded that the variables that met the requirements were humidity (100%), ventilation area (90%), occupancy density (84%), lighting intensity (54%), ceramic floor type (98%), while temperature variables 49 houses (98%) did not meet health requirements.

**SUGGESTIONS**
This study only describes the physical condition of the homes of patients with TB, so that other researchers can develop with other research methods.

REFERENCES

1. Indonesia Health Profile, 2016, Ministry of Health of the Republic of Indonesia
3. Law No.1 Year 2011 About Housing and Settlement Area
4. Decree of the Minister of Health of the Republic of Indonesia Number: 829 / Menkes / SK / VII / 1999 concerning Health requirements Housing.
6. Cissy B. Kartasasmita, Tuberculosis Epidemiology, Sari Pediatric Journal, Padjajaran University, Vol. 11 No.2 August 2009
9. Regulation of the Minister of Health of the Republic of Indonesia Number 1077 / Menkes / Per / V / 2011 concerning Guidelines for Restoring Air in the House Room.