



**Relationship Between Intensity And Humidity With Leprosy
In The City Of Semarang Central Java**

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Abstract

Background: Leprosy is also called leprosy caused by the bacterium *Mycobacterium leprae*. This bacterium undergoes a cleavage process for 2-3 weeks. Leprosy resistance reaches 9 days outside the human body. Leprosy bacteria have an incubation period of 2-5 years and can even take more than 5 years. Leprosy can reduce the quality of life of sufferers if it is not found and not treated early.

Objective: To find out the relationship between the intensity of lighting and humidity with the incidence of leprosy in the city of Semarang

Method: The type of this research was analytic

observational with case control study design carried out in the work area of Semarang City Health Center with a sample of 23 people and 46 control groups. Data collection through interviews, observation and measurement of humidity and lighting. Data analysis using chi-square test.

Results: The results showed a significant relationship between the intensity of lighting (p -value = 0.032) and leprosy and there was no relationship between humidity (p -value = 0.347) and leprosy in Semarang City.

Conclusion: Based on the results of the interviews, the measurements found 62.2% of the respondents' houses in the case group with lighting conditions that did not meet the requirements. It is recommended to reduce the risk of leprosy transmission to improve the condition of the house, open the window every morning so that sunlight can enter well into the house and increase the effort to create a clean and healthy home environment.

Keywords: leprosy

Introduction

Leprosy is also called leprosy caused by the bacterium *Mycobacterium leprae*. This bacterium undergoes a cleavage process for 2-3 weeks. Leprosy resistance reaches 9 days outside the human body. Leprosy bacteria have an incubation period of 2-5 years and can even take more than 5 years. Leprosy can reduce the quality of life of sufferers if it is not found and not treated early (WHO, 2017).

Based on WHO reports, the top three countries with the highest number of leprosy cases are India, Brazil and Indonesia, in the third place. In 2015, the largest number of leprosy patients was in India, with 127,326 cases followed by Brazil with 26 cases, 395 cases and Indonesia with 17,202 cases. Then in 2016 Indonesia still ranks third highest in leprosy prevalence in the world after Brazil and India. Throughout 2016 WHO recorded India with 135,485 and Brazil 25 cases. 218 then Indonesia had 16 826 cases (WHO, 2017).

During the period 2010 to 2015 in Central Java, the number of new leprosy cases found in 2010, 2013 and 2015 was 5.3 per 100,000 population. While the leprosy prevalence rate ranges from 0.6 to 0.8 per 10,000 (6.0 to 8.0 per 100,000 population). In 2015 there were 1,801 new cases of leprosy reported, including the Multi Basiler type. Whereas according to gender, 36.5% of women were female. Central Java still has a high leprosy burden because there are more than 1,000 leprosy cases found (Dinkes, 2016).

Indonesia nationally has reached leprosy elimination in 2000, but until now the discovery of leprosy cases is still found in several regions in Indonesia including in Semarang City. Early detection and prevention of leprosy is needed to avoid disability due to leprosy.⁴

Leprosy is an infectious disease that causes complex problems, not only in terms of medical but also social and economic problems that occur due to the bad stigma of the community towards disability (Widjaya, 2011).

Based on data from the Semarang City Health Office in 2016, 35 cases of leprosy found an increase compared to 2015 as many as 27 cases. Leprosy cases consist of PB type 6 cases (18%) and MB type 29 cases (82%). In the beginning of 2017 until October 2017 there were still 33 leprosy cases in the city of Semarang. There are 13 community Health centers working areas found by patients suffering from leprosy (Basuki & Wibowo, 2016).

Factors suspected to be the originators of leprosy include age, gender, level of education and type of work. Therefore the researchers want to do a study about the description of the characteristics of respondents and socio-economic with leprosy in the city of Semarang.

Method

This study uses research methods. analytic observational with case control study design The population in this study were all lepers who lived and settled in the health centers of Bandarharjo, Sekaran, Padangsari, Bangetayu, Kagok, Gayamsari, Bulu lor, Pandanaran, Ngaliyan, Pegandan and Karangdoro Semarang City. This study was conducted in April 2107-May 2017 (Basuki & Wibowo, 2016). The samples in this study were all leprosy patients in the work area of the Semarang City Health Center. Data collection through interviews with questionnaires to respondents' homes. After all the data is collected, the researcher performs data processing in several stages, namely checking the accuracy and completeness of the data, then inputting the SPSS program. Data analysis used in this study is univariate to find out and obtain results on the relationship between lighting intensity and humidity in a home with leprosy

Result

Relationship between Lighting Level and Occurrence

The results of bivariate analysis between variable levels of leprosy with leprosy in Semarang City can be seen in the following table:

Table 1.
Relationship between levels of leprosy and incidence of leprosy

Intensity of leprosy	Genesis of Leprosy						P	OR (95 % CI)
					Total			
	Case		control					
	n	%	n	%	n	%		
< 60 lux	15	62,2	16	34,8	31	44,9	0,032	3,516
> 60 lux	8	34,8	30	65,5	38	55,1		(1,229-10,056)
amount	23	100	46	100	69	100		

Based on Table 1 it is known that the proportion of respondents in the case group who had a house with a level of lighting did not meet the requirements of 62.2% while the respondents in the control group who had a house with a level of lighting did not meet the requirements of 34.8%. The results of the chi square test showed that there was a significant relationship between the intensity of lighting and the incidence of leprosy (p-value = 0.032), [OR = 3.516 (95% CI, 1.222-10.056)]. This can be interpreted that respondents who live in homes with lighting intensity do not meet the 3.5 times risk of experiencing leprosy compared to respondents who live in homes with lighting intensity that meets the requirements.

Direct lighting into the house can reduce leprosy transmission because ultraviolet light from the sun has the ability to kill pathogenic germs. One of the efforts is to control the growth of pathogenic bacteria by using ultraviolet radiation. The results showed that there was a relationship between the intensity of lighting and the incidence of leprosy, this was because only a number of respondents from both the case and control groups whose lighting conditions in the house did not meet the requirements. The results of this study are in line with research conducted by Nurcahyati et al (2016) which states that there is a significant relationship with the incidence of leprosy. Research conducted by Rismawati (2013) shows that respondents who have poor lighting conditions in the house are at risk 3, 190 times to suffer from leprosy (Rismawati, 2013). The wise effects of lighting in the home are less explained by Amiruddin, et al (2003). Lack of light entering the house causes high humidity. This condition is a growing medium that is good for leprosy germs and other microorganisms. High humidity causes the nasal mucous membrane to dry up so that it is effective in blocking microorganisms. In addition, based on research by Faturahman (2011) conducted on 70 samples in Cilacap District that house lighting that does not meet syata is 6 times greater risk for leprosy than a well-known room (Faturahman, 2011).

Natural lighting and or directly or indirectly can illuminate the entire room with a lighting intensity of at least 60 lux and not dazzling. Sunlight can kill pathogenic germs. Sunlight also affects the temperature and humidity in the house. The temperature of bacterial growth can vary, there are those that grow at low temperatures of 15°C-20°C and some even grow at high temperatures. *Mycobacterium leprae* grows at an optimal temperature of 37°C

Table 2
Relationship between Moisture Level and Cause

Humidity	Genesis of Leprosy				Total		<i>P</i>	OR (95 % CI)
	case		control					
	n	%	n	%	n	%		
< 40%-70% >	15	65,2	23	50,0	38	55,1	0,347	1,875 (0,666-5,276)
40%-70%	8	34,8	23	50,0	31	44,9		
amount	23	100	46	100	69	100		

The results of the bivariate analysis between variable levels of leprosy with leprosy in Semarang City can be seen in the following table:

Table 2. Moisture Statistical Test Results With Leprosy

Table 5. Relationship between levels of leprosy and incidence of leprosy

Based on table 5 it is known that the proportion of respondents in the case group that the temperature in the house did not meet the requirements contained 52.2% while the respondents in the temperature control group in the house did not meet the requirements there were 58.7%. Statistical test results obtained p-value = 0.666 [OR = 0, 701 (95% CI; 0, 255-1,925)], meaning that there was no significant relationship between the temperature in the house and the incidence of leprosy. It can be concluded that respondents who live at home with temperatures that meet the requirements have a protective effect of 0.701 times on the incidence of leprosy.

Lighting conditions affect temperature and humidity in the house. A damp house is a good medium for the growth of microorganisms. Based on observations, almost all respondents both the case group and the control group had humidity that did not meet the requirements. There are several factors that affect humidity in the house such as type of floor, and type of wall. Observations in terms of the physical condition of many houses have not met the health requirements as well as the number of residents who live in the respondent's house. Based on table 2, it is known that the p value is > 0, 05 which means there is no relationship between humidity in the house and the incidence of leprosy, but even though the condition of the respondent's house is from the interview that respondents often open their home windows every morning. They really understand that the morning sun is very good for health. So even with the physical condition of the house that most of them do not meet health requirements, the respondent's knowledge of the benefits of sunlight may help reduce the level of humidity in the respondent's house. This reduces the risk of suffering from leprosy and may be the cause of no significant relationship with the incidence of leprosy in the work area of the Semarang city health center. The results of this study are in accordance with the research conducted by Rismawati in 2013 the results of statistical tests showed p value = 0, 487 which means there is no relationship between humidity in the house and the incidence of leprosy. Likewise with the research conducted by Wicaksono in 2015 that there was no relationship between weaknesses with the incidence of leprosy in Bandar Lampung City. In addition to lighting and humidity factors, there are also other factors that influence leprosy events such as socio-economic influences which also affect the incidence of leprosy. This needs further research (Satrina et.al, 2018).

Conclusion

The level of lighting of the respondent's house in the non-eligible cases was 62.2% and in the control group 44.9%, and the humidity level of the respondent's house in the case group that did not meet the requirements was 65.2% and the humidity level of the respondent's house in the control group 50, 0%.

To reduce the risk of leprosy transmission to improve the condition of the house, open the window every morning so that sunlight can enter well into the house and increase efforts to create a clean and healthy home environment and familiarize the number of residents who meet health requirements to reduce the potential for leprosy transmission .

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