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Correlation between personal hygiene and the incidence of leprosy in Central Jakarta area in 2017

Siti Aisah*, Ahmad Haykal Abdurahman Bubakar, Nenden Lilis Setiasih

Department of Medical Education, Faculty of Medicine of YARSI University, Jakarta, Indonesia

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*Correspondence:

Dr. Siti Aisah,

E-mail: aisyahchoir@yahoo.com

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ABSTRACT

Background: Leprosy is a chronic infectious disease caused by *Mycobacterium leprae* (*M. leprae*) which mainly attacks the skin and peripheral nerves. Indonesia is the third country with the most leprosy sufferers with 17,202 cases. The Ministry of Health of the Republic of Indonesia reports that the cumulative number of leprosy cases in 2013 in Indonesia was 16,856 cases. Among them is multibacillary-type leprosy. Although Indonesia achieved national elimination of leprosy in June 2000, the number of leprosy sufferers in Indonesia is still quite high. The high number of multibacillary types shows epidemiological problems and serious clinical implications because patients with multibacillary-type leprosy are a source of leprosy transmission and have a higher risk of reaction and disability due to nerve damage. The spread of leprosy in Indonesia is caused by several factors, one of which is related to hygiene behavior related to skin hygiene, hand and nail hygiene, genital hygiene, clothing hygiene, towel hygiene, mattress and bed hygiene that do not meet health requirements.

Methods: The objective of this study was to determine the correlation of personal hygiene and the level of transmission of leprosy in Central Jakarta. Primary data is quantitative data obtained directly from respondents through a questionnaire instrument. Presentation and analysis of data is performed through computer using the SPSS 22 for Windows program using statistical analysis. To find out the correlation between personal hygiene and the incidence of leprosy, Chi-Square analysis was used.

Results: The analysis found that the p-value was $0.004 < \alpha = 0.05$ which means that H1 is accepted. It is concluded that there is a significant correlation between personal hygiene and the incidence of leprosy in the Central Jakarta area in 2017.

Conclusions: The correlation is that someone who has leprosy has poor personal hygiene. Meanwhile, someone who has good personal hygiene does not suffer from leprosy.

Keywords: Infection, Leprosy, *Mycobacterium leprae*, Personal hygiene, Skin

INTRODUCTION

Leprosy has affected humans for thousands of years. This is a chronic infectious disease caused by *Mycobacterium leprae (M. leprae)*, which mainly attacks the skin and peripheral nerves.¹ Most leprosy sufferers were in India with 127,326 cases, followed by Brazil with 26,395 cases, and Indonesia with 17,202 cases.²

Leprosy is a serious health problem and requires special attention and treatment. Leprosy can also cause very complex problems.³ The Ministry of Health of the Republic of Indonesia reports that the cumulative number of leprosy cases in 2013 in Indonesia was 16,856 cases, among which were multibacillary-type leprosy.

Although Indonesia nationally achieved leprosy elimination in June 2000, the number of leprosy sufferers

in Indonesia is still quite high. The high number of multibacillary types shows epidemiological problems and serious clinical implications because patients with multibacillary-type leprosy are a source of leprosy transmission and have a higher risk of reaction and disability due to nerve damage.⁴

The spread of leprosy in Indonesia is caused by several factors, one of which is related to hygiene behavior related to skin hygiene, hand and nail hygiene, genital hygiene, clothing hygiene, towel hygiene, mattress and bed hygiene that do not meet health requirements.⁵

Based on the brief description above, the formulation of the problem in this study is about the correlation between personal hygiene and the level of transmission of leprosy in Central Jakarta.

METHODS

This is an observational descriptive study that uses a cross sectional design where independent and dependent variables are measured at the same time.⁶ The research data were obtained from Community Health Centers and Hospitals throughout Central Jakarta that showed data on patients infected with leprosy. This is a quantitative study that requires quantitative data that are relevant to the variables formulated in the research problem and can be analyzed statistically.^{7,8} The study population was people infected with leprosy in the Central Jakarta area.

The study was conducted at the Public Health Centers and Hospitals registered in Central Jakarta. This study took samples that met the inclusion and exclusion criteria. Inclusion criteria included (a) being infected with leprosy, (b) being treated, (c) aged 13-65 years, (d) male and female. In addition, the exclusion criteria include: (a) not willing to take part in the research, (b) not staying in Central Jakarta, (c) not being in place when the research takes place, (d) staying alone. Determination of the sample is carried out using the simple random sampling method by considering the inclusion and exclusion criteria that have been set previously.

The number of samples in this study were divided into two parts consisting of a case group and a control group. Data from case groups were obtained through interviews with leprosy patients and tracking medical records. Meanwhile, the control group is a person who does not suffer from leprosy but lives in one district with a leprosy sufferer. The number of samples is determined based on the formulation of sample determination for case control cases that the sample must be 17 people for each group (cases and controls). Thus, the total sample in this study was 34 people.

This research uses primary data types; i.e. quantitative data obtained from the questionnaire instrument which aims to find out the level of public knowledge and education as well as the level of leprosy in the Central Jakarta area in 2017.

The data collection instrument was a questionnaire. The data, collected through filling out the questionnaire, goes through a cleaning process to ensure its completeness and accuracy. Then, it continues with the input process to the computer with a coding system. Presentation and analysis of data is carried out through a computer using the SPSS 22 for Windows program using appropriate statistical analysis. The results are presented in tabular form. It will present category data which will be analyzed using adjusted statistical tests.

RESULTS

From 34 samples in this study, the distribution of the characteristics of the respondents can be seen in (Table 1).

Table 1: Respondent characteristic.

Characteristic		Case	Control	Total
Gender	Male	12	11	23
Gender	Female	5	6	11
	≤20 years	6	8	14
A 90	21-40 years	6	7	13
Age	41-60 years	2	1	3
	>60 years	3	1	4
	Uneducated	1	0	1
Educational	Elementary	6	2	8
background	Junior High	2	4	6
Dackground	Senior High	8	8	16
	University	0	3	3
	Housewife	4	5	9
	Entrepreneur	2	2	4
Occupation	Private company worker	3	3	6
	Student	3	6	9
	Unemployed	5	1	6
Ethnicity	Betawi	13	9	22
	Melayu	2	0	2
	Sundanese	1	3	4
	Javanese	0	1	1
	Minang	1	3	4
	Arabian	0	1	1

Based on the table above, the respondents in this study were dominated by male respondents. Then, based on age, it is dominated by respondents who are less than or equal to 20 years old. Furthermore, based on educational background, it is dominated by respondents who have the Senior High School last education.

Meanwhile, based on occupation, it is dominated by respondents who worked as housewives and students. In addition, based on ethnicity, it is dominated by Betawi people. The data can be seen in (Table 2).

Based on the (Table 2), with a total sample of 34 respondents, it was dominated by respondents who had good personal hygiene as many as 22 respondents (64.7%).

Table 2: Frequency distribution of personal hygiene variable.

Personal hygiene	Frequency	%
Good	22	64.7%
Poor	12	35.3%
Total	34	100%

Based on (Table 3), with a total sample of 34 respondents, the frequency of leprosy sufferers and those who did not suffer from leprosy was the same; i.e. each of 17 respondents (50%). In this case, the correlation between personal hygiene and leprosy sufferers is obtained by using case control.

Table 3: Frequency distribution of leprosy patients.

Leprosy	Frequency	%
Positive	17	50%
Negative	17	50%
Total	34	100%

The analysis used to determine the correlation between personal hygiene and leprosy events is the Chi-Square correlation. In this study, the correlation of each calculation between the independent variable and the dependent variable through a significance test.

The following is the inferential statistical calculation hypothesis to see the correlation between personal hygiene and the incidence of leprosy in the Central Jakarta area in 2017:

- H₀: ρ = 0 (there is no correlation between personal hygiene and the incidence of leprosy)
- H_1 : $\rho \neq 0$ (there is a correlation between personal hygiene and the incidence of leprosy)
- $\bullet \quad \alpha = 0.05$

The research data obtained a cross tabulation between personal hygiene and the incidence of leprosy as presented in (Table 4).

There were 17 respondents who suffered from leprosy (cases) which all of them had never had personal hygiene with leprosy sufferers. Meanwhile, there were 17 respondents who did not suffer from leprosy (control) of which there were 8 respondents who had personal hygiene and 9 respondents did not have personal hygiene (Table 4).

The test results on the correlation between personal hygiene and the incidence of leprosy can be seen in (Table 5).

Table 4: Cross tabulation between personal hygiene and the incidence of leprosy.

Personal hygiene	Leprosy		Total
	Positive	Negative	
Poor	10	2	12
Good	7	15	22
Total	17	17	34

Test criteria will accept H1 if p-value $<\alpha$ and accept H0 if p-value $>\alpha$. Based on statistical tests on the Chi-Square correlation obtained from the table above, the p-value is $0.004 < \alpha = 0.05$. Thus, H1 is accepted which means that there is a significant correlation between personal hygiene and the incidence of leprosy in the Central Jakarta area in 2017.

Table 5: Correlation between personal hygiene and the incidence of leprosy.

	Value	df	Exact Sig (2-sided)
Chi square Test	8.242	1	0.004
No. of valid cases	34		

DISCUSSION

To analyze the correlation between personal hygiene and the incidence of leprosy, Chi Square correlation was used. This study tests the null hypothesis stating that there is a correlation between personal hygiene and the incidence of leprosy (with alpha 5%).

Based on statistical tests, Chi Square correlation obtained p-value of 0.004. These results indicate that the p-value < alpha which causes H_1 is accepted and H_0 is rejected. It means that there is a significant correlation between personal hygiene and the incidence of leprosy in the Central Jakarta area in 2017. This correlation is that leprosy sufferers are dominated by people who have poor personal hygiene. Meanwhile, those who are not leprosy sufferers are dominated by people who have good personal hygiene.

The results of this study are in line with research conducted by Muharry which showed a significant correlation between personal hygiene and the incidence of leprosy of 0.000 (p=0.000 (p<0.05).3 It means that there is a significant correlation between personal hygiene and the incidence of leprosy in Tirto District in 2007. The add-ratio is OR = 15.746 (95% CI=4.159-59.612), so that it is concluded that someone who has bad personal hygiene has a risk of 15.746 times greater than someone who has good personal hygiene. In addition, the results of this study are also in line with the results of research conducted by Curnelia which shows the significance of the correlation between personal hygiene and the incidence of leprosy. 11 The Chi-Square test results obtained a value of p=0.004 (p<0.05). It means that there is a significant correlation between personal hygiene and the incidence of leprosy in Kunduran District of Blora Regency in 2015. In addition, the add-ratio value in CI-95% was 0.227 so that respondents who had low personal hygiene had a 0.227 times greater risk of developing leprosy than respondents who had high personal hygiene. Values of OR >1 and 95% CI do not include the number 1 which means that low personal hygiene is a risk factor for leprosy.

CONCLUSION

Based on the results of the discussion that has been described regarding the correlation between personal hygiene and leprosy events in the Central Jakarta area in 2017, the Chi Square correlation statistical test obtained a p-value of 0.004 which is smaller compared to $\alpha = (5\%)$. This shows that there is a significant correlation between personal hygiene and the incidence of leprosy in the Central Jakarta area in 2017. The correlation is that leprosy sufferers are dominated by people who have poor personal hygiene. Meanwhile, those who are not leprosy sufferers are dominated by people who have good personal hygiene.

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Institutional Ethics Committee

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