Analysis of Personal Hygiene, Household Sanitation Status of Lungs Tuberculosis Nutrition

Mariana[1], Emma Novita[1], Pariyana[1], Annisa Muthia Haryani[2], Rifqoh Trikurnia[2]

[1]Department of Public Health-Community Medicine, Faculty of Medicine, Sriwijaya University,
[2]Study Program of Medical Profesion, Faculty of Medicine, Sriwijaya University, Palembang

Email: ma_hanafiah@yahoo.com

ABSTRACT

Nutritional status determines the level of health and function of all vital systems in the body, including the immune system. The immunization system as a host of various infectious diseases. Cell-mediated immunity in the body plays an important role as a defense against tuberculosis. Therefore, malnutrition can be considered as an important consideration factor in Tuberculosis efforts. The impact of malnutrition is so severe that there is an increase in the prevalence of Tuberculosis associated with HIV infection. Many factors cause Tuberculosis, some debates are Environment. Environmental factor is one that affects home lighting, humidity, temperature, conditions, roofs, walls, floors and residential density. Besides environmental factors there are also other factors which consist of gender, age, income, hygiene knowledge and practices as well as knowledge about resistance to tuberculosis also influencing the increase in disease. The purpose of this study is to collect data that will help prevent many complications from tuberculosis, especially those caused by malnutrition and hygiene in the neighborhood. Research Object: Patients in Palembang City Health Center Work Area. Research Location: Palembang City Health Center Work Area. This research is an observational analytic study of categorical comparative hypothesis testing with a cross-sectional research design. The results of the analysis of the chi-square test were 0.000 <0.05 there is a relationship between the incidence of malnutrition in pulmonary TB patients with the sanitary conditions of the patient's home environment. Relationship between Personal Hygiene and Nutritional Status of Lung TB The results of the analysis of the chi-square test were 0.000 <0.05. Conclusions and Suggestion From the results of this study there are still many bad personal hygiene that can have an impact on Tuberculosis. In addition, poor environmental sanitation has an effect on Tuberculosis. Therefore, this research needs to be continued to determine the impact of poor home environmental sanitation and personal hygiene. Further education and counseling must be carried out by the general public regarding information about Tuberculosis

Keyword : Tuberculosis, cell mediate imunity, sanitation

1. INTRODUCTION

Tuberculosis is a direct infectious disease caused by the bacteria Mycobacterium tuberculosis. Most Tuberculosis germs attack the lungs, but can also affect other organs. the source of transmission is smear pulmonary tuberculosis (+) patients who can transmit it to people around them, especially those who make close contact. These bacteria have a high fat content in the cell membrane, causing these bacteria to be resistant to acids and the growth of germs takes place slowly.[1]

Tuberculosis (TB) is a leading cause of ill health, one of the 10 leading causes of death worldwide and a leading cause of death due to an infectious agent (ranked above HIV / AIDS). This is caused by bacillus Mycobacterium tuberculosis, which spreads when a sick person with TB

expels bacteria into the air; for example by coughing. This usually affects the lungs (pulmonary TB) but can also affect other sites (extrapulmonary TB). About a quarter of the world's population is infected with M. tuberculosis and is at risk of developing TB.[2] With timely diagnosis and treatment with first-line antibiotics for 6 months, most people who suffer from TB can be cured and the subsequent transmission of infection continues. The number of TB cases that occur each year (and thus the number of TB-related deaths) can also be reduced by reducing the prevalence of health-related risk factors for TB (eg smoking, diabetes and HIV infection), providing preventative treatment for people with latent TB infection, and taking multisectoral actions on broader determinants of TB infection and disease (eg poverty, housing quality and malnutrition). [2]

Globally, an estimated 10.0 million (range, 9.0-11.1 million) 2 people fell ill with TB in 2018, a relatively stable number in recent years. The burden of discomfort varies greatly between countries, from less than five to more than 500 new cases per 100,000 population per year, with a global average of around 130. There are estimates of 1.2 million (range, 1.1-1.3) mil-lion) TB deaths among HIV-negative people in 2018 (27% reduction from 1.7 million in 2000), and an additional 251,000 deaths (range, 223 000-2281 000) 3 among HIV-positive people (a 60% reduction from 620,000 in 2000). [2] According to the World Health Organization in 2018, Tuberculosis was among the 10 most causes of death in the world. In 2017, Tuberculosis is estimated to cause 1.3 billion deaths annually. WHO states Indonesia ranks third in the world in the number of pulmonary tuberculosis after India and China.[2] In 2015 there were an estimated 10.4 million new cases of tuberculosis or 142 cases / 100,000 population, with 480,000 multidrug-resistant cases.[3]

The percentage of TB patients notified who had documented HIV test results in 2018 was 64%, up from 60% in 2017. In the WHO Africa Region, where the burden of HIV-related TB is the highest, 87% of TB patients have HIV test results documented. A total of 477,461 TB cases among HIV-positive people were reported, of whom 86% were taking antiretroviral therapy.[2]

Nutritional status determines the level of health and function of all vital systems in the body, including the immune system. The immune system acts as a host of various infectious diseases. Cell mediated immunity in the body plays an important role as a defense against tuberculosis. Therefore, malnutrition can be considered as an important risk factor for tuberculosis. The impact of malnutrition is so severe that there is an increase in the prevalence of Tuberculosis associated with HIV infection.[5]

Many risk factors can trigger Tuberculosis, some of which are environmental. Environmental factors are one that affects home lighting, humidity, temperature, conditions, roofs, walls, house floors and residential density. Besides factors the environment there are also other factors in the form of gender, age, income, knowledge and hygiene practices of a person as well as knowledge and attitudes towards preventing tuberculosis also influence the occurrence of the disease.[6] The specific purpose of this study is to collect data that will help prevent many complications from tuberculosis, especially those caused by malnutrition and hygiene in the neighborhood. To find out personal hygiene and house sanitation in Tuberculosis patients in the work area of Puskesmas, To analyze the relationship of personal hygiene and home sanitation to the nutritional status of Tuberculosis patients, To analyze the factors that most contribute to the nutritional status of Tuberculosis patients.

Nutritional status determines the level of health and function of all vital systems in

the body, including the immune system. The immune system acts as a host of various infectious diseases. Cell mediated immunity in the body plays an important role as a defense against tuberculosis. Therefore, malnutrition can be considered as an important risk factor for tuberculosis. The impact of malnutrition is so severe that there is an increase in the prevalence of Tuberculosis associated with HIV infection. Many risk factors can trigger Tuberculosis, some of which are environmental. Environmental factors are one that affects home lighting, humidity, temperature, conditions, roofs, walls, house floors and residential density. In addition to environmental factors there are also other factors in the form of gender, age, income, hygiene knowledge and practices of a person as well as knowledge and attitudes towards preventing tuberculosis also influence the occurrence of disease.[7]

Tuberculosis is an infectious disease caused by infection with the bacterium Mycobacterium tuberculosis. The disease is spread through droplets of people who have been infected with tuberculosis bacilli.[8] The main symptoms of tuberculosis sufferers are coughing for 2 weeks or more, coughing accompanied by additional symptoms such as phlegm, phlegm mixed with blood, shortness of breath, body weakness, decreased appetite, decreased body weight, malaise, night sweats without physical activity, fever more than 1 month.[9]

2. METHODS

This research is an observational analytic study of categorical comparative hypothesis testing with a cross-sectional research design. This research was conducted from July 2019 - August 2019 in the working area of the Puskesmas. The study population was all adult pulmonary tuberculosis sufferers in the working area of the Puskesmas undergoing initial or advanced therapy. Most adult pulmonary

tuberculosis sufferers in the working area of the puskesmas meet the criteria for inclusion and exclusion. Based on the above calculation, a minimum sample size of 151 is obtained.

The inclusion criteria of this study included tuberculosis patients with normal BMI and below normal BMI, adult tuberculosis patients, pulmonary tuberculosis patients undergoing initial or advanced therapy. While the Exclusion Criteria in this study were Tuberculosis Patients with a BMI above normal (overweight) Tuberculosis Patients who had been jammed to undergo therapy.

The independent variables of this study are environmental sanitation, nutritional status, age, sex, marital status, employment, and education. The dependent variable of this study was malnutrition in patients with tuberculosis. Univariate analysis of the independent variables (environmental sanitation, nutritional status, age, sex, marital status, employment, and education) and the dependent variable (quality of life) are presented in the form of distribution tables. Bivariate analysis namely categorical dependent variables and categorical numerical variables were analyzed using Chi Square test and t-test (2x2 comparative categorical hypothesis test) to find out whether there is a relationship between personal hygiene and environmental sanitation with malnutrition in patients with pulmonary tuberculosis in the work area of puskesmas. To determine the risk factors that most contribute to the control of malnutrition in TB patients is a binary logistic regression analysis (multivariate analysis).

3. RESULT

This research was conducted in July-August 2019 at 23 Ilir Puskesmas, Kampus Puskesmas, Merdeka Puskesmas, and 7 Ulu Puskesmas. The study population was all adult pulmonary tuberculosis sufferers in

the working area of the puskesmas undergoing initial or advanced therapy. The number of samples studied was 151 samples. Based on the Tabel 1. results of the study obtained from 151 patients with pulmonary TB, there were 85 people (56.29%) who experienced malnutrition while 66 others (43.71%) had normal nutritional status or were not malnourished. 73 people (48.34%) of pulmonary TB patients are male while 78 people (51.66%) are female. The majority of pulmonary TB patients have jobs namely 83 people (54.97%) while 68 people (45.03%) others do not work. As many as 110 people (72.85%) of pulmonary TB patients were married and only 41 people (27.15%) were single.

The majority of pulmonary TB sufferers were the same age and were less than 57 years old as many as 124 people (82.12%) and only 27 people (17.88%) were aged over 57 years.

Table 1. Charateristic of Responden

Characteristic	n	%
Nutritional Status		
Malnutrition	85	56.29
Normal	66	43.71
Gender		
Male	73	48.34
Female	78	51.66
Occupation		
Work	83	54.97
Not work	68	45.03
Marital status		
Married	110	72.85
Single	41	27.15
Age		
≤ 57 years	124	82.12
> 57 years	27	17.88
Home Sanitation		
Unhealthy	92	60.93
Healthy	59	39.07
Education		
Elementary school	35	23.18
Junior high school	31	20.53
Senior high school	65	43.05
Collage	20	13.25
Personal Hygiene		
Bad	73	48.34
Moderate	52	34.44
Good	26	17.22
Total	**151**	**100**

The results of the analysis of the chi-square test were 0.000 <0.05 (α) so reject H0. That is, with a 95% confidence level it can be stated that there is a relationship between the incidence of malnutrition in pulmonary

TB patients with the sanitary conditions of the patient's home environment.

Table 2. Relationship between Environmental Sanitation and Nutritional Status of Lung TB Patients

Sanitation	Nutritional Status				Amount		p value
	Malnutrition		Normal				
	n	%	n	%	n	%	
Unhealthy	67	78.82	25	37.88	92	60.93	0.000
Healty	18	21.18	41	62.12	59	39.07	
Total	**85**	**100**	**66**	**100**	**151**	**100**	

Based on the results of the study, there were 56 people (65.88%) of new TB sufferers who suffered from Malnutrition had bad personal hygine and only 18 people (21.18%) of new TB sufferers who had Malnutrition had moderate category personal hygine and only 11 people (12.94%) New TB sufferers who suffer from Malnutrition have a good personal hygine category. On the other hand, the majority of pulmonary TB patients who are not malnourished have the majority of moderate personal hygine which is 34 people (51.52%) and there are 15 people (22.73%) patients with pulmonary TB who do not have malnutrition have good personal hygine while pulmonary TB patients who do not Malnutrition but have bad personal hygine, only 17 people (25.76%).

The results of the analysis of the chi-square test were 0.000 <0.05 (α) so reject H0. That is, with a 95% confidence level it can be stated that there is a relationship between the incidence of malnutrition in pulmonary TB patients with the patient's personal hygiene.

Table 3. Relationship between Personal Hygine and Nutritional Status of Lung TB

Personal Hygine	Nutrition Status				Amount		p value
	Malnutrition		normal				
	n	%	n	%	n	%	
Bad	56	65.88	17	25.76	73	48.34	
Moderate	18	21.18	34	51.52	52	34.44	0.000
Good	11	12.94	15	22.73	26	17.22	
Total	**85**	**100**	**66**	**100**	**151**	**100**	

Multicollinearity is the correlation between independent variables, while in the regression analysis does not allow correlation between independent variables, so that the multicollinearity with spearman correlation is checked (correlation for categorical data and not spread normally).

In the table above, the correlation between home sanitation variables with personal hygiene is 0.226 where the correlation coefficient is classified as a weak correlation. The correlation value is from 0-1, the closer to 1, the stronger. While the correlation that shows Multicollinearity is a strong correlation that is> 0.8. Therefore, the assumption of non-multicollinearity is fulfilled.

The table above shows the coding of each variable. In this coding, the category coded 0 is used as a comparison (reference code).

Table 4. Significance Test
    Multivariate Analysis. Non-Multicollinearity Assumption Test.

Variables	B	p value	Exp (B)	95% CI
Constant	-1.235	0.012	0.291	
Home sanitation (1)	1.610	**0.000**	5.004	2.330-10.747
Personal Hygine (1)	1.361	**0.009**	3.898	1.411-10.772
Personal Hygine (2)	-0.242	0.648	0.785	0.278-2.2181

4. DISCUSSION

The results of this study are in line with previous studies of Rikha et al. In 2012, there were more Tuberculosis in patients less than 57 years old. That is because in the productive age category, there is a great risk of transmitting tuberculosis.[10] Productive age is very dangerous to the level of transmission because patients easily interact with others. High mobility and allows it to spread to other people and the environment around the place of residence.[11] It was found that there were 92 people (60.93%) of pulmonary TB patients who had classified as unhealthy home sanitation while 59 people (39.07%) had classified as healthy home sanitation. The home environment was one of the factors that play a role in the spread of tuberculosis germs. The condition of the roof of the house, walls and floors was significantly related to the incidence of Tuberculosis. Slum communities who live in houses with non-standard roofs will have 3.6 times chance of being exposed to Tuberculosis and for non-standard house walls have a 4.9 times chance and 2.5 times have the chance to get Tuberculosis. Bad houses or dwellings (less good) can support the transmission of diseases and health problems, including respiratory infections.[12]

This study shows that more Tuberculosis patients have poor environmental sanitation as in previous studies which showed more tuberculosis patients had poor environmental sanitation.[10] Based on the results of the study showed that the majority of patients with pulmonary TB educated at the Senior high school /vocational level were 65 people (43.05%). Then, there were 35 people (23.18%) educated to elementary school, 31 people (20.53) had junior high school education, and only 20 people

(13.25%) had completed their education to tertiary Based on the results of the study showed that the majority of patients with pulmonary TB have personal hygine that is not good or bad, namely 73 people (48.34%) while 52 people (34.44%) have personal hygine in the moderate category.

The majority of patients with pulmonary TB have personal hygine that is not good or bad, namely 73 people (48.34%) while 52 people (34.44%) have personal hygine in the moderate category. Only 26 people (17.22%) are good in terms of personal hygine. As in previous studies, many tuberculosis patients have poor personal hygiene. Like not closing your mouth when coughing, the habit of throwing spit carelessly out of place.[10] that the majority of patients with pulmonary TB have personal hygine that is not good or bad, namely 73 people (48.34%) while 52 people (34.44%) have personal hygine in the moderate and only 26 people (17.22%) are good in terms of personal hygine. As in previous studies, many tuberculosis patients have poor personal hygiene. Like not closing your mouth when coughing, the habit of throwing spit carelessly out of place.[11] In Medan on the case of Pulmonary Tuberculosis also showed that individual hygiene variables (habit of salivating, coughing, and smoking), environmental sanitation variables (occupancy capacity, availability of clean water, detention environment and cleanliness of cutlery / drink) significantly influence the incidence of pulmonary tuberculosis.[9]

Based on the results of the study, there were 67 people (78.82%) new TB sufferers who suffered from Malnutrition had unhealthy environmental sanitation and only 18 people (21.18%) new TB sufferers who experienced Malnutrition had healthy environmental sanitation. On the other hand, the majority of pulmonary TB sufferers who are not malnourished have a healthy sanitation home environment that is 41 people (62.12%) while the pulmonary TB patients who are not malnourished but have unhealthy environmental sanitation are only 25 people (37.88%). Poor environmental sanitation and personal hygiene have an impact on the nutritional status of malnutrition. This was due to the possibility of secondary infection in TB patients originating from environmental support and poor personal hygiene, such as acute diarrhea, typhoid fever, dysentery, etc.[13]

5. CONCLUSION

From the results of this study there are still many bad personal hygiene that can have an impact on Tuberculosis. In addition, poor environmental sanitation has an effect on Tuberculosis. Therefore, this research needs to be continued to determine the impact of poor home environmental sanitation and personal hygiene. Further education and counseling must be carried out by the general public regarding information about Tuberculosis. An interactive interpersonal approach is needed so that people can understand and apply good and healthy environmental hygiene and sanitation practices. An interactive approach program can also be carried out on groups or health cadres to create a health-conscious community. Thorough and holistic, Tuberculosis treatment and prevention must be implemented to reduce the Tuberculosis incidence rate starting from the application of clean and healthy living behavior, increasing public awareness to routinely conduct Tuberculosis treatment, by continuing to pay attention to good environmental sanitation that is not seen from the physical condition of the house alone but also by looking at the environment, behavior, society in it. In the future, we hope that further research can develop the results of this research, with various conditions and developments faced by the people of Indonesia. Judging from the current development of new problems

that have arisen about tuberculosis has been a lot. This can be a reference for further study.

REFERENCES

[1]. Tabrani. (2010). *Ilmu Penyakit Paru.* Jakarta: CV Trans Info Media.

[2]. World Health Organization. (2018). Global Tuberculosis Report Executive Summary 2018.

[3]. WHO. (2015). *Global Tuberculosis Report.* Geneva: World Health Organization.

[4]. Dinkes Palembang. (2017). *Profil Kesehatan.* Palembang: Dinas Kesehatan Kota Palembang.

[5]. Das. (2018). A study of nutritional assesment of newly diagnosed tuberculosis patient in a tertiary care hospital of Tripura, India. *International Journal of Research in Medial Science*, 1382-1387.

[6]. Budi, I., Ardillah, Y., & Septiawati, D. (2018). Analisis Faktor Risiko Kejadian penyakit Tuberculosis Bagi Masyarakat Daerah Kumuh Kota Palembang. *Jurnal Kesehatan Lingkungan Indonesia*, 94.

[7]. Putra, I. (2012). *Malnutrisi dan Tuberkulosis.* Jakarta: Indonesia Medical Association Adigun, R., & Singh, R. (2019). Tuberculosis. *National Center for Biotechnology Information*.

[8]. Kemenkes, R. I. (2016). Regulation of the Minister of Health No. 67 on Tuberculosis Control Jakarta (Peraturan Menteri Kesehatan Nomor 67 Tentang Penanggulangan Tuberkulosis Jakarta). *Jakarta: Kemenkes RI.*

[9]. Kementrian Kesehatan RI. (2018). *Info Datin Tuberkulosis .* Jakarta: Kementrian Kesehatan RI.

[10]. Pertiwi, R. N. (2012). Hubungan antara karakteristik individu, praktik hygiene dan sanitasi lingkungan dengan kejadian tuberculosis di Kecamatan Semarang Utara Tahun 2011. *Jurnal Kesehatan Masyarakat Universitas Diponegoro*, *1*(2), 18811.

[11]. Wahyu, r. T. (2008). Hubungan kondisi fisik rumah dan praktik kesehatan dengan kejadian tb paru di puskesmas maospati kabupaten maagetan (doctoral dissertation, diponegoro university).

[12]. Prasetyowati, I dan Wahyuni, C.U. 2009. Hubungan antara Pencahayaan Rumah, Kepadatan Penguhi dan Kelembaban dan Risiko Terjadinya Infeksi TB Anak SD di Kabupaten Jember. Jurnal Kedokteran Indonesia, 1 (1) : 88-93.

[13]. Manalu, H.S.P., 2010, "Faktor-Faktor yang Mempengaruhi Kejadian TB Paru dan Upaya Penanggulangannya", Jurnal Ekologi Kesehatan Vol. 9 No. 4, Desember 2010: 1340-1346. K. R. (2013). *Pedoman Nasional Pelayanan Tatalaksana Tuberkulosis.* Jakarta: Kementrian Kesehatan RI.