

Research Article

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THE CORRELATION BETWEEN INDIVIDUAL CHARACTERISTICS AND SMEAR-POSITIVE PULMONARY TUBERCULOSIS IN PUUWATU HEALTH CENTER, KENDARI CITY

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Abstract

Background: Pulmonary tuberculosis is still a health problem in Kendari City, especially for several health care centres areas with the highest number of cases in 2019. The number of cases in Puuwatu Health Center area in the last two years has decreased by 14.5% but still ranks first with The highest number of pulmonary tuberculosis cases was in Kendari City. The aim of this study was to analyze the correlation between individual characteristics and smear-positive pulmonary in Puuwatu health center, Kendari City.

Methods: This research is analytic observational using a Case Control Study design, with a matching procedure using a retrospective approach. The population in this study were all 59 patients with pulmonary TB smear (+) registered in Puuwatu Health Center of Kendari City in 2019 with a total sample size of 37 case samples and 37 control samples selected by simple random sampling technique.

Results: The results showed that gender, education and job were risk factors for tuberculosis (Odds ratio 3.83; 3.43; 5.95 > 1) and age was not a risk factor (Odds ratio 0.94 < 1). Furthermore, there is a relationship between the individual characteristics of age, sex, education and job with the incidence of pulmonary tuberculosis (p-value 0.002; 0.01; 0.002; 0.001 < α (0.05).

Conclusion: The conclusion in this research is that it is expected that all people in the Puuwatu Community Health Center job area to always improve their hygiene and healthy living habits. Government agencies can provide outreach on community prevention.

Key words : Tuberculosis, Age, Sex, Education, Job.

INTRODUCTION

Tuberculosis or Pulmonary tuberculosis is an infectious disease caused by *Mycobacterium tuberculosis*, which can attack the lungs and other organs. Tuberculosis is still a public health problem that causes high morbidity, disability, and mortality, so it is necessary to do prevention efforts. One of the national strategies for controlling pulmonary tuberculosis is controlling the risk factors for pulmonary tuberculosis. Control of risk factors for pulmonary tuberculosis is aimed at preventing, reducing transmission and incidence of pulmonary tuberculosis (1). Control of pulmonary tuberculosis risk factors is carried out by cultivating a clean and healthy lifestyle, cultivating ethical coughing behavior, maintaining and improving the quality of housing and its environment in accordance with healthy home standards (2).

Tuberculosis is a major global health problem as the leading cause of death for millions of people every year worldwide after Human Immunodeficiency Virus (HIV). In 2015, there were an estimated 10.4 million incidents of new tuberculosis cases worldwide, of which 5.9 million (56%) were men, 3.5 million (34%) occurred in women and 1 million (10%) occurs in children. Tuberculosis is one of the top 10 causes of death worldwide in 2020, it is estimated that there are 1.4 million deaths due to tuberculosis (3).

Data from the Ministry of Health in 2018, the number of tuberculosis cases found was 566,623 cases, an increase when compared to all tuberculosis cases found in 2017 which amounted to 446,732 cases. Pulmonary tuberculosis can attack all ages, not only old age, but also young age and productive age. According to the age group, most tuberculosis cases were found in the 45-54 years age group, namely 14.2%, followed by the 25-34 years age group at 13.8% and in the 35-44 years age group 13.4%. The number of tuberculosis cases in males was higher than in females, namely

1.3 times than in females. In each province throughout Indonesia, more cases occur in men than women (4).

Tuberculosis cases in Southeast Sulawesi Province showed that in 2016 3,105 new BTA positive cases (BTA +) were found, an increase compared to 2017 with 2,587 cases. However, in 2018 there were 3,965 cases (59% men and 41% women). The distribution of cases by district / city shows that the number of new BTA positive cases reported in 2018 came from 5 districts / cities, namely Kendari City 668 cases, Muna Regency 510 cases, Konawe Regency 444 cases, Bau-Bau City 363 cases, and Kolaka Regency 300 cases (5). Data on tuberculosis cases in Kendari City in the last 2 years has decreased, where in 2016 the number of pulmonary tuberculosis cases was 583 cases, in 2017 there were 545 cases, in 2018 there were 676 cases and in 2019 it increased to 711 cases. Thus the problem of pulmonary tuberculosis is still a health problem in Kendari City, especially for several Puskesmas job areas with the highest number of cases in Kendari City in 2019, namely health center Puuwatu, Kemaraya and Poasia (6).

The number of cases in Puuwatu Health Center job area in the last three years shows that in 2017 there were 76 sufferers, in 2018 it decreased to 69 sufferers and in 2019 there were 59 people with pulmonary tuberculosis. Although in the last three years the number of tuberculosis cases in Puuwatu Health Center job area has decreased, it is still a health problem because the Puuwatu Community Health Center Work Area is the Puskesmas job area with the highest pulmonary tuberculosis cases in Kendari City (7). Exposure to tuberculosis in a person is influenced by socio-economic factors, nutritional status, age and gender (8). Meanwhile, according to (9) several possible factors that are at risk of pulmonary tuberculosis include population factors (age, gender, nutritional status, family role, occupation, education level), home environmental factors (area of



ventilation, occupancy density, lighting intensity, floor type, humidity, temperature, and type of wall), behaviors include sleeping habits of tuberculosis sufferers, sleeping habits of mattresses, habits of expelling saliva or phlegm, habits of opening bedroom windows, smoking habits and contact history. This study aims to analyze the correlation between individual characteristics with smear-positive pulmonary tuberculosis in Puuwatu health center, Kendari City.

METHOD

This research is an analytic observational study using a Case Control Study design, with a matching procedure using a retrospective approach. Case control is a study conducted by comparing two groups, namely the case group and the control group based on their exposure status (10). The population in this study were all 59 patients with pulmonary tuberculosis smear (+) registered in Puuwatu Health Center Kendari City in 2019 with a total sample size of 37 case samples and 37 control samples

with a ratio of 1: 1 so that the number of possible samples in this study is 74 samples. The case sample was positive Lung tuberculosis (AFB) patients while the control sample was not positive lung tuberculosis (AFB) patients but had the same characteristics. The sampling technique in this study was simple random sampling. The data were analyzed by using the Odds ratio to determine the amount of risk and Chi-Square to determine the relationship between individual characteristics and the incidence of tuberculosis.

RESULT

The results of the descriptive analysis show that of the 74 respondents, the most age categories were in the age range 17-25 years, as many as 22 respondents (29.7%), 32 respondents (43.2%) were the most gendered category, the highest level of education was high school, totaled 44 respondents (59.4) and the largest occupation was self-employed, amounting to 32 respondents.

Table 1. The results of the analysis of the relationship between individual characteristics and the incidence of smear-positive pulmonary tuberculosis

Individual Characteristics	Pulmonary Tuberculosis				Odds Ratio	Lower Limit (LL) -Upper Limit (UP)	p-value
	Case		Control				
	n	%	n	%			
Age							
Non Productif	14	37,8	2	5,4	0,94	LL = 0,019 UL = 0,452	0,002
Productif	23	62,2	35	94,6			
Sex							
Man	23	62,2	11	29,7	3,883	LL = 1,474 UL = 10,230	0,010
Woman	14	37,8	26	70,3			
Educatio							
Low	18	48,6	8	21,6	3,434	LL = 1,246 UL = 9,467	0,028
High	19	51,4	29	78,4			
Job							
Hadjob	25	78,4	14	37,8	5,955	LL = 2,133 UL = 16,626	0,001
Not have job	8	21,6	23	62,2			

Table 1 shows that of the 37 respondents in the case group, 23 (62.2%) were respondents with non-productive age and 14 (37.8%) respondents with productive

age. Meanwhile, of the 37 respondents in the control group, 35 (94.6%) were respondents with non-productive age and 2 (5.4%) respondents with productive age. Based on

gender in the case group, 23 (62.2%) respondents were male and 14 (37.8%) female respondents. Meanwhile, of the 37 respondents in the control group, 11 (29.7%) were male and 26 (70.3%) were female. Based on the education in the case group, 18 (48.6%) respondents had a low level of education and 19 (51.4%) respondents had a high level of education. Meanwhile, of the 37 respondents in the control group, 8 (21.6%) respondents had a low level of education and 29 (78.4%) respondents had a high level of education. Furthermore, based on work in the case group, 29 (78.4%) respondents had a job and 8 (21.6%) respondents did not have a job. Meanwhile, of the 37 respondents in the control group, 14 (37.8%) respondents had a job and 23 (62.6%) respondents did not have a job.

The results of statistical tests on the 95% confidence interval obtained an Odds Ratio value of 0.94 (LL = 0.019 - UL = 0.452) because the Odds Ratio value does not include number 1 and the p-value (0.002) is smaller than α (0.05) then H_0 is rejected, meaning that at the level of confidence 95% age is not a risk factor for new smear positive pulmonary tuberculosis but a new positive smear pulmonary tuberculosis in the Puuwatu Community Health Center Work Area. In the gender variable, the Odds Ratio value is 3.883 (LL = 1.474 - UL = 10.230) because the Odds Ratio value is greater than 1 and the p-value (0.010) is smaller than α (0.05) so H_0 is rejected, meaning that at level of confidence 95% gender is a risk factor and a determinant factor of new smear positive pulmonary tuberculosis in the Puuwatu Community Health Center Work Area. In the education variable, the Odds Ratio value is 3,433 (LL = 1.246 - UL = 9.467), because the Odds Ratio value is more than 1 and the p-value is 0.028, then H_0 is rejected, meaning that at the 95% confidence level education is a risk factor and a determinant factor. new smear positive pulmonary tuberculosis in the Puuwatu Community Health Center Work Area. Furthermore, the job variable obtained an Odds Ratio value of

5.955 which is greater than Daein 1 (LL = 2.133 - UL = 16.626) and the p-value (0.001) is smaller than α (0.05) so H_0 is rejected, meaning that at the 95% confidence level work is a risk factor and a determinant factor of new smear positive pulmonary tuberculosis in the Puuwatu Community Health Center Work Area.

DISCUSSION

Tuberculosis is a direct infectious disease caused by the tuberculosis germ (*Mycobacterium tuberculosis*). It is estimated that one third of the world's population has been infected by *Mycobacterium tuberculosis* and 75% of tuberculosis patients are in the economically productive age group (15-50) years. The results showed that age was not a risk factor but a cause of tuberculosis. Respondents with more productive age suffer from pulmonary tuberculosis. The results of this study are in line with (4) Tuberculosis is a direct infectious disease caused by the tuberculosis germ (*Mycobacterium tuberculosis*). It is estimated that one third of the world's population has been infected by *Mycobacterium tuberculosis* and 75% of tuberculosis patients are in the economically productive age group (15-50) years. The results showed that age was not a risk factor but a cause of tuberculosis. Respondents with more productive age suffer from pulmonary tuberculosis. The results of this study are in line with (11, 12) that the rate or degree of transmission of this disease depends on the number of tuberculosis bacilli in the sputum, upper virulence, bacilli and the chance of air pollution from coughing, sneezing and speaking loudly. And this disease is very sensitive and indiscriminate at all ages, whether babies, toddlers, old or young. This finding is in line with research conducted by (13, 14) states that the productive age has a greater risk of transmission of pulmonary tuberculosis than the unproductive age, besides that the proportion of respondents at productive age tends to be 76.7% higher.

The results showed that gender was the cause of tuberculosis, where men were 3.8 times more likely to suffer from tuberculosis than women. It is in accordance with (4, 15) which states that the number of tuberculosis cases in men is 1.5 times more than that of women. One of the causes of differences in the frequency of pulmonary tuberculosis between men and women is differences in life habits. The possible difference in life habits is smoking and drinking alcohol. Where more men smoke and drink alcohol than women, smoking and alcohol can lower the body's immunity so that it is more susceptible to pulmonary tuberculosis. (16, 17). This theory is in line with research conducted by (18) who say that the prevalence of smoking is much higher for men than women. More than 20% of adult males are active smokers and the incidence of tuberculosis of 100 per 100,000 population per year occurs mostly in men aged over 65 years. The results of the research which are in line show that there is a significant relationship between sex and the incidence of pulmonary tuberculosis. This study shows that men are more likely to suffer from pulmonary tuberculosis than women (19, 20). Observation result (21) Pulmonary tuberculosis sufferers have a habit of not closing their mouths when coughing, which can cause tuberculosis to be transmitted to healthy people around them and an increase in cases of pulmonary tuberculosis is influenced by endurance, nutritional status, and individual personal hygiene. Differences in the incidence of disease according to sex can arise due to different anatomical, physiological and hormonal systems.

The results of the study showed that education was a factor causing the incidence of pulmonary tuberculosis with a large risk of transmission 3.4 times among respondents with low education. In theory, education shows the quality of human resources which will greatly affect human productivity. In a simple and general sense the meaning of education is a human effort to cultivate and

develop the potentials of both physical and spiritual inheritance in accordance with the values that exist in society. (22, 23). The level of education will affect a person's knowledge, including about things related to health, for example about tuberculosis, so that with good knowledge, someone will behave in a healthy life. (24-26). The level of education has a significant relationship with pulmonary tuberculosis prevention behavior. A person's education level will affect one's knowledge, including about health, so that with sufficient knowledge, someone will try to have a healthy lifestyle (27, 28). Other supporting research shows that there is a significant influence or relationship between the level of education and the behavior to prevent the transmission of pulmonary tuberculosis. In addition, other research results indicate that there are differences in behavior between levels of education. This explains that limited opportunities for education are factors that can affect health levels and disease prevention efforts (29, 30).

The results also show that work is the cause of the incidence of tuberculosis, where respondents who work are 5.9 times more likely to suffer from tuberculosis than those who do not work. According to (31) the type of work determines the risk factors that each individual must face. When workers work in a dusty environment, exposure to dust particles will affect the occurrence of respiratory tract disorders. Chronic exposure to polluted air can increase morbidity, especially the occurrence of respiratory diseases and especially pulmonary tuberculosis (32, 33). Research that explains occupational variables related to pulmonary tuberculosis prevention behavior shows that respondents who have good preventive behavior are mostly respondents who have jobs compared to those who do not work. In addition, work will affect the use of health services, besides that a person's job will reflect the amount of information received, including information about health services (34-36).

CONCLUSIONS

Age is not a risk factor but a cause of tuberculosis incidence, where respondents with more productive age suffer from pulmonary tuberculosis. Gender is associated with the incidence of tuberculosis and is a risk factor with a greater risk of 3.8 times for male gender. For the education variable it is related to the incidence of pulmonary tuberculosis and is a risk factor with a large risk of 3.4 times for low-educated respondents. For occupational variables related to the incidence of pulmonary tuberculosis and is a risk factor with a large risk of 5.9 times the respondents who work.

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