THE INFLUENCE OF KNOWLEDGE, HOUSEHOLD CONTACT, AND VENTILATION ON THE RISK OF PULMONARY TUBERCULOSIS IN PADANGSIDIMPUAN CITY, NORTH SUMATERA

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ABSTRACT

Introduction: Tuberculosis remains a global health problem. Indonesia was the second rank for tuberculosis cases among 30 high tuberculosis burden countries. In Padangsidimpuan city, the number of new tuberculosis cases had increased from 301 cases in 2015 to 351 cases in 2017. The aim of study was to determine the association of knowledge, household contact, and ventilation with pulmonary tuberculosis in Padangsidimpuan city.

Methods: A case control study was conducted among 56 cases and 56 controls. Cases were smears positive pulmonary tuberculosis patients diagnosed in June to October 2018. The control group consisted of their neighbor without tuberculosis symptom. A set of questionnaire was used to collect information on knowledge, household contact and ventilation. The data were analyzed by a multiple logistic regression.

Results: The results showed that factors associated with pulmonary tuberculosis were bad knowledge (OR=7.840; 95% CI: 2.521-24.379), household contact (OR=4.259; 95% CI: 1.730-10.485), and ineligible ventilation (OR=3.029; 95% CI: 1.149-7.988).

Conclusion: The risk of pulmonary TB increases with bad knowledge, household contact, and ineligible ventilation.

Keywords: knowledge, household contact, ventilation, pulmonary tuberculosis

1.0   INTRODUCTION

Pulmonary tuberculosis (TB) is still a global health problem. It is estimated that 87% of TB cases from 30 countries categorized as high TB burden countries for the highest pulmonary TB cases are in the Southeast Asia region (45%), followed by the Africa region (25%) and the Western Pacific region (17%), and the lowest in the region Eastern Mediterranean (7%), European regions (3%), and American regions (3%) (WHO, 2017). The incidence of TB in Indonesia in 2017 was found to be 319 cases per 100,000 population or 842 incidents / year and deaths due to TB were 40 per 100,000 population or 107,000 deaths / year (WHO, 2018).Riskesdas data in 2013 according to population characteristics, the highest number of all pulmonary TB sufferers in the age group 65-74 years (0.8%), male gender group (0.4%), group-of-school education (0.5%) and the group does not work (11.7%) (RI Ministry of Health, 2013a).

Data from the North Sumatra Provincial Health Office in 2016, the number of new TB case finding reached 105.02 / 100,000 population, the number of suspected TB was 114,060 people while the number of smear positive TB was 14,892 people. The highest TB data sequence in regencies / cities is in Medan City which is 3,006 / 100,000 population, Deli Serdang Regency is 2,184 per 100,000 populations, and Simalungun Regency is 962 per 100,000 populations. Padangsidimpuan city was rated 13th in the amount of 375 / 100,000 population increased by 29% from 2015, amounting to 290 / 100.00 populations (North Sumatra Provincial Health Office, 2017). In 2015 the number of smear-positive TB cases in which 301 patients Padangsidimpuan City, 2016 is 382 patients, and 351 patients for 2017. Work Areas Padangsidimpuan City Health Department consists of nine public health centers (Padangsidimpuan City Health Office, 2017).

TB increased exposure in the community for their chances of contact with the source of infection, such as the degree of infectiousness of sputum, cough frequency, the closeness of contact, contact time, and the environment (RI Ministry of Health, 2014). Home and family is one of the potential environmental occurrence of disease due to the interaction of family members with TB positive (Amin et al, 1989), meaning that they are staying at home more at risk of contracting as it has close contact with the patient (Benerson, 1990 in Susilowati, 2011).

TB patients with positive smear have a transmission rate of 65%, TB patients with negative smear plus positive culture results by 26%, while TB patients with negative culture results and positive x-rays by 17% (Ministry of Health Republic of Indonesia, 2014).

Public health center as health service first is the direct executor of pulmonary TB program in the community. The DOTS (Directly Observed Treatment Short-course) strategy has been implemented nationally since 2000 in all health care facilities. The five components of the DOTS strategy are as follows: 1) Political commitment, 2) Microscopic diagnosis, 3) Short-term treatment and direct supervision, 4) Availability of effective and guaranteed quality OAT, 5) Recording and reporting system (RI Ministry of Health, 2011).

Based on a preliminary survey in the Padangsidimpuan City Health Office in 2017, the number of smear positive pulmonary TB cases was 351 with a proportion of cases of 9.58%. From the number of cases, the highest number of positive smear TB patients is in the Sadabuan Health Center as many as 93 people (7.24%) and the Padangmatinggi Health Center as many as 87 people (9.58%), while the two lowest in Pokenjior health centers were 9 people (7.83%) and health centers as much as 3 Doors Heaven (4.84%).

Based on the problem above, the researcher wants to examine the influence of knowledge, household contact, and ventilation on the incidence of positive smear pulmonary TB in Padangsidimpuan City.

This study aims to analyze the influence of knowledge, contacts at home, and venting on the incidence of smear-positive pulmonary TB in Kota Padangsidimpuan.

2.0 RESEARCH METHODS

This type of research is observational analytic using an unmatching case control study design. The location of the study was carried out in 4 Padangsidimpuan City Health Centers, Sadabuan Health Center, Padangmatinggi Health Center, Pokenjior Health Center, PintuLangit Health Center and the time of the study was conducted from December 2017 until completion.The sample size is 56 respondents, consisting of 56 respondents in the case group and 56 respondents in the control group with a comparison between case groups: the control group is 1:1. The total sample was 112 people. The sampling technique in this study was purposive sampling.

Primary data is done by interviewing the respondent directly through a questionnaire, and taking measurements. Secondary data were obtained from health reports or documents from 4 Padangsidimpuan City Health Centers. Data analysis is univariate analysis, bivariate analysis with simple logistic regression statistical tests and multivariate analysis with multiple logistic regression tests.

3.0 RESEARCH RESULTS

3.1 Univariate Analysis

The results showed that the majority of respondents' knowledge was poor in the case group (91.1%) and the control group (51.8%). The majority of household contacts were contacts in the case group (66.1%) and the majorities were no contacts in the control group (71.4%). The majority of respondents living at home did not meet the requirements in the case group (80.4%) and the control group (51.8%).

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3.2 Bivariate Analysis

The results of bivariate analysis using the Simple Logistic Regression test mean that the variables of knowledge, household contact, and ventilation have p <0.25 so that they can be included in the multivariate analysis modeling and Multiple Logistic Regression tests.

Table 1
The influenceof of knowledge, household contact, and ventilation on positive smear pulmonary tuberculosis with Simple Logistic Regression Test

| Variabel | smear positive pulmonary TB incidence | | | | OR (95%CI) | p |
| | Case | | Control | | | |
	n	%	n	%		
Knowledge						
Good	5	8,9	27	48,2	9,497	0,005
Bad	51	91,1	29	51,8	(3,298-27,343)	
Household Contact						
No	19	33,9	40	71,4	4,868	0,001
Yes	37	66,1	16	28,6	(2,185-10,849)	
Ventilation						
Eligible	11	19,6	27	48,2	3,809	<0,001
Ineligible	45	80,4	29	51,8	(1,641-8,842)	

3.3 Multivariate Analysis

Overall, this model can explain knowledge, household contact, and ventilation in the incidence of positive smear pulmonary TB in Padangsidimpuan City. The results of this analysis confirm that the independent variable has the ability to predict the dependent variable by 75.0% (overall percentage 75.0%) while the remaining 25,0% is influenced by other factors.

Table 2
Summary of Multivariate Analysis Results Based on Multiple Logistic Regression Test Results

| Variabel | B | Sig. | OR | 95% C.I | |
				Lower	Upper
Knowledge	2,059	0,000	7,840	2,521	24,379
Household Contact	1,449	0,002	4,259	1,730	10,485
Ventilation	1,108	0,025	3,029	1,149	7,988
Constant	-2,980	0,000	0,051	-	-

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4.0 DISCUSSIONS

4.1The influence of Knowledge toward positive smear pulmonary TB incidence

This study shows that in the case group the majority of respondents had poor knowledge by 91.1% and in the control group the majority of respondents had poor knowledge by 51.8%. Results Logistic regression analysis found no significant effect of knowledge on the incidence of smear-positive pulmonary TB with a value of $p = 0.000$; OR = 7.840; 95% CI 2.521-24.379, this means people with poor knowledge had 7.840 times risk exposed smear positive pulmonary TB than people whose knowledge is good.

Based on these results the high responder in the case group had a lower knowledge because knowledge of those asked in a case that is before suffering from TB. The busyness of the respondents also caused them to lack health information, especially TB prevention, which could allow new cases of pulmonary TB to appear if not prevented properly. Another thing is also because respondents' statements about TB are witchcraft, coughs caused by dust, and non-communicable diseases.

Efforts made in TB prevention and control program activities (P2TB) are better to provide clear information to the public about pulmonary TB, and the community can also participate if there are activities regarding health carried out by health workers including informing about TB that TB is not a black magic, curse or heredity because TB can affect anyone. Then provide counseling about the ethics of cough and proper phlegm removal, as well as informing that TB can be cured with proper, complete and regular treatment.

These results are consistent with research Sasilia (2013) found no significant relationship between knowledge with pulmonary TB infection ($p = 0.0001$).

4.2 Influence of household contacts to smear positive pulmonary TB incidence

This research shows that the majority of respondents who have household contact are 66.1% and in the control group the majority of respondents have no household contact at 71.4%.

The logistic regression test results found that there was a significant effect between household contact on the incidence of positive smear pulmonary TB with a value of $p = 0.002$; OR = 4.259 (95% CI 1.730-10.485), meaning that people who have household contact are at risk for positive smear pulmonary TB 4.259 times compared to people who have no household contact.

Problems that often occur due to patient behavior when sneezing and coughing will not close your mouth either by using a mask or even with a handkerchief and the habit of spitting in any place. Preventive measures can be taken by acting clean and healthy, wearing masks, removing

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phlegm and spit on cans or the like that contain soap or carbolic water or Lysol, covering the mouth and nose when coughing or sneezing, and taking medication regularly.

In line with the study of Pangalo, Asrifuddin, and Kapantow (2018) that contact history is a risk factor where the value of OR = 3.143, this is influenced by the presence of smear positive pulmonary TB patients who have lived at home, such as parents, relatives or other families, and lack of awareness of the health of the home environment.

4.3 Influence of Ventilation to smear positive pulmonary TB incidence

This research shows the majority of respondents in the case group to stay at home ventilation are not qualified by 80.4% and in the control group stayed at home ventilation majority of respondents who do not qualify for 51.8%.

The logistic regression test results found that there was a significant effect between ventilation on the incidence of positive smear pulmonary TB with a value of $p = 0.025$; OR = 3.029 (95% CI 1.149-7.988), meaning that respondents living in ventilated homes that do not meet the requirements will be at risk of developing positive smear pulmonary TB 3.029 times compared to respondents living in ventilating homes that fulfill the requirements.

The conditions found in the field that the respondent did not open the window because many respondents' activities outside the home. Respondents start to open the window in the morning at 05.30 then they will close the window when they want to do activities, and will not reopen until the morning.Inadequate ventilation will cause germs in high concentrations to increase the risk of transmission to those around them, and unsupervised air will cause the air inside to become damp and become a TB germs.

Ventilation has a function that is to maintain the flow of air in the house is maintained, so that the air remains cool for its inhabitants, to free the room air from pathogenic bacteria, and to keep the house room always in optimum humidity. Size qualified ventilation healthy is 10% of the floor area (Notoatmodjo, 2011).

In line with research Damayati et al. (2018) showed that respondents who had ventilation area did not meet the risk of having 6,000 times the risk of suffering from pulmonary TB compared to respondents who had ventilation area fulfilled the requirements.

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5.0 CONCLUSIONS

1. There is an effect of knowledge on the incidence of positive AFB smear TB
2. There is an effect of household contact on the positive smear pulmonary TB incidence
3. There is an effect of ventilation on the incidence of smear positive pulmonary TB
4. The most dominant variable on the incidence of positive smear pulmonary TB is knowledge with an OR value of 7.840 (95% CI: 2.521-24.379) meaning that respondents who have poor knowledge have a risk of 7.840 times more likely to get positive smear pulmonary TB compared to people with good knowledge.

6.0 SUGGESTIONS

1. ForPadangsidimpuan City Health Office
a. Improving cross-sector cooperation both with the Head, Head, religious leaders, community leaders to mobilize communities to participate in TB control in Padangsidimpuan City.
b. Collaborating with the Social Service to improve the physical environment of the home, especially for TB sufferers to meet health requirements.

2. For Health Center
a. Empowering the community through its programs in the form of improvement of facilities and infrastructure, promotion and counseling of health programs and clean and healthy life movement, and building of alert villages.
b. Improve counseling, especially public knowledge about pulmonary TB such as causes, symptoms, ways of transmission, ways of prevention such as the use of masks when coughing, good sputum management, maintaining a healthy body by maintaining a healthy diet and consuming nutritious food.

3. For Researchers
a. It is hoped that other researchers will develop this study by examining different risk factors in order to be more knowledgeable about the incidence of positive smear pulmonary TB.

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