

Factors Associated with Pulmonary Tuberculosis Patients Who Received Anti-TB Treatment

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Abstract Pulmonary tuberculosis is a chronic infectious disease that was firmly related to the environment and human behavior. To overcome pulmonary tuberculosis, various factors associated with TB who received anti-TB treatment became significant. Therefore, we extended the Riskesdas data analysis To determine the various factors related to Pulmonary TB patients received anti-TB treatment. Subject treated with anti-TB treatment became the dependent variable, while the independent variables consisted of subjects characteristics (age, gender, and education level), socio-economic status and residential classification. Logistic regression was used to identify factors associated with the use of anti-tuberculosis. The result showed that male subjects with age of 35 until 44 years, low education, consider poor in economic and inhabited in an urban area more common in subjects with anti-TB treatment. Thus, characteristics of subjects (age, gender, and education level), socio-economic status and residential classification are the factors of subjects treated with anti-tuberculosis in Indonesia.

1 INTRODUCTION

The pulmonary tuberculosis reduction efforts in Indonesia has started since pulmonary TB eradication symposium held at Ciloto in 1969. Until the early of year 2000 the development of pulmonary TB control have not shown an encouraging results (Ministry of Health, 1996). Poor treatment compliance among pulmonary TB patients makes the bacteria become resistant in the human body. Supervision during the treatment process can not be implemented properly by families and the patients (Situmeang, 2013). In order to recovered, the regularity and compliance is an absolute matters for patients.

The combination of short-term anti-tuberculosis medications and the roles of TB medications supervisor is a basic strategy to ensure the patients recovery (Aditama, 2002). There are many factors that influence the success of treatment, such as the duration, compliance and regularity to treatment, the patients immune system, the limited access to healthcare services due to various socio-economic factors and geographical conditions (Adnani and Mahastuti, 2006). The purpose of this study was to analyze the determinant factors of pulmonary TB

subjects who treated with anti-tuberculosis medications

2 METHODS

This study uses a non reactive approach or unobtrusive study method, a study that does not require a response or active participation from the subjects because they are part of Riskesdas 2013 studies. Further analysis of this study completely follow the Riskesdas 2013 population and sample frame. The population of this study were the entire household in Indonesia with the same sampling frame used in Riskesdas 2013. About 2500 households scattered across the province became the sample. The sampling criteria was every household member with aged 15 or older who were diagnosed with pulmonary TB through sputum examination and lung photo or interview by health workers. Eventually 14.098 peoples were obtained as eligible sample for study.

Instrument and the data collection in this study fully utilize the secondary data from Riskesdas 2013 interviews form using a structured questionnaire, in the form of households and selected individuals questionnaire. As dependent variable in this study

were subjects treated with anti-tuberculosis, while the independent variables include individual characteristics, socio-economic status as well as the classification of residential (rural or urban). Univariate analysis was used to obtain the frequency distribution and mean value, while bivariate analysis was used to assess the relationship between independent and dependent variables. Logistic regression analysis was also conducted to determine factors related to anti-tuberculosis treatments.

3 RESULT AND DISCUSSION

Result

In the Table 1 shows that based on gender, more men suffer from pulmonary TB (52.7%) than women, while by group of age most patients with pulmonary TB were at young age group (54.3%). Patients with low levels of education were also a lot more than higher education that which is equal to 73.9%, while the patient's socio-economic status more on middle quartile (42.0%). For residential classification, more pulmonary tuberculosis patients residing in rural (55%), while 60.4% of pulmonary TB patients did not use anti-tuberculosis medications.

Table 1: Pulmonary TB Patients Characteristic Distribution

Characteristic		Freq	%
Gender	Men	7431	52,7
	Women	6667	47,3
Group Age	Young-age	7658	54,3
	Middle-age	4901	34,8
	Old-age	1539	10,9
Education Level Category	Low	10423	73,9
	High	3675	26,1
Socio-economic status	Lowest	2875	20,4
	Middle	5923	42
	Highest	5300	37,6
Residential Classification	Urban	6348	45
	Rural	7750	55
Anti-Pulmonary TB medications usage	Yes	5582	39,6
	No	8516	60,4

The relationship between the subjects who used anti-tuberculosis medication with individual characteristics, socio-economic status and residential classification can be seen in table 2.

Table 2: Logistic Regression Test Results againsts studied variables

Variable	P	OR
Gender	0,000	1,368
Age	0,000	0,821
Education levels	0,000	1,182
Socio-economic status	0,000	1,095
Residential classification	0,000	0,673

The analysis showed a significant relationship between the subjects who used anti-tuberculosis medications with gender, age, education level, socio-economic status, and residential classification. The patients working status variable did not significantly influence the use of anti-tuberculosis medications ($p = 0.454$). After variables with no significant relation were removed then a logistic regression models was obtained, as shown in table 3.

Table 3: The result of the logistic regression test variables that influence anti-pulmonary TB medication usage

Variable	p	OR	95% CI
Gender	0,000	1,354	1,270 – 1,474
Age	0,000	0,822	0,803 – 0,839
Education levels	0,000	1,185	1,082 – 1,291
Socio-economic status	0,000	1,094	0,954 – 1,112
Residential classification	0,000	0,671	0,623 – 0,727
Constant	0,000	1,430	

The logistic regression analysis result showed that the gender variable significantly influence anti-tuberculosis medications usage among patients with pulmonary tuberculosis ($p = 0.000$). With 1.354 odd ratio value, it indicates that male patients tend to use anti-tuberculosis medications 1.4 times than female patients. The variable of age also affect significantly ($p = 0.000$). If we look the odd ratio, its indicating that younger patients tend to use anti-tuberculosis medications 0.8 times than older patients. While odd ratio value for levels of education showed that patients with lower levels of education tend to use anti-tuberculosis medications 1.2 times than patients with a higher education level.

The logistic regression analysis result also showed that the socio-economic status influence significantly ($p = 0.000$) againsts anti-tuberculosis medications usage. Odd ratio value for socio-economic variable showed that patients within middle level tend to use anti-tuberculosis medications 1.1 times than patients with the highest socio-economic level.

In the residential classification variables also showed a significant influence on anti-tuberculosis medications usage ($p = 0.000$). Value odds ratio indicates that patients who live in rural areas tend to use anti-tuberculosis medications 0.7 times than patients who live in urban areas.

Discussion

Related to analysis between gender and TB risk factors, Chandra et al (2004) also explained several researches in developed countries confirming that men have a greater contracted risk then among women due to physical contact. Those studies clearly states the relationship between gender and pulmonary tuberculosis occurrence and how gender play a determinant role in an individual susceptibility against pulmonary tuberculosis. High numbers of male patients suspected to be caused by men's higher mobility and its interaction activities compare to women. Under these conditions, men was believed to be more easily exposed against pulmonary tuberculosis bacteria.

Age becomes a variable that is always considered in epidemiological investigations. Generally those who belong to very young or very old group of age are more vulnerable and less immune to certain diseases due their lack of immune system (Sub Direktorat TB, 2008). In the pulmonary TB incidence among boys and girls until the age of puberty did not show any significant difference. But after they passed the age of puberty to adulthood, there are various differences in different countries.

Pulmonary TB in Indonesia mostly found in the range of productive age (35-44 years) as much as 21.3 percent. People who are in the productive age group tend to have higher mobility thereby increasing their risk against pulmonary tuberculosis bacteria exposure (Sub Direktorat TB, 2008). On the other hand the different experiences against health issues and decision-making are influenced by a person's age. Bart in Widoyono (2008) stated that elderly people tend to follow the doctor's advice, show more responsibility, more orderly, more conscientious, more moral and more dutiful than younger age.

The high level of education is not always followed by the improvement in the level of medication adherence. Patients with low levels education do not always have a poor knowledge about pulmonary tuberculosis, as well as the opposite. Therefore, tasked health personnel in handing medicine still need to continue provide information regarding medication guidance for patients (Wahyono, 2010). Information received by the

respondents considered as a factor that influencing the respondents adherence level.

Around fifty five percent of Indonesian pulmonary TB patients live in rural areas. Settlement environments factors play an important role in determining the pulmonary TB transmission occurrence. The physical environment includes the residential density (the number of bedrooms against user ratio), air ventilation, lighting, temperature and chamber humidity.

A study by Murti (2004) explained that based on the residential area classification, pulmonary tuberculosis patients in rural areas are more commonly found in residential with a pretty high densities (63.65%) while pulmonary tuberculosis patients in urban areas are more commonly found in residential with low density (59/6%).

Related health services, community health centers located in urban and rural areas has conducted pulmonary TB control activities, where the level of achievement reached 98.4% for health centers in urban areas (Risksdas, 2013). The ease of transportation access to health care centers can also be a supporting factor related to the patients compliance in taking anti-tuberculosis medications (Sub Direktorat TB, 2008).

As of 60.4 percent of Indonesian TB patients did not taking anti-tuberculosis medications, it has become a habit among pulmonary tuberculosis patients to switch treatment for reason there was no change in the disease condition and even tends to get worse.10 Although the medications guidelines that have been set by the government already very good but if pulmonary TB patients did not treated regularly, then generally the treatment results will be disappointing, causing the failure of which may result in resistance (Wahyono, 2010).

The availability of health facilities for people with pulmonary TB are adequate, especially the availability of PHC (90.2%). Coverage PHC as the forefront of pulmonary TB control activities and treatment services has reached ninety-five percent. Support the availability of TB medication in the health centers, in urban or rural, has reached the range of 60 to 79 percent (Risksdas, 2013). A research by Perdana (2008) which shows the relationship between health services with the use of anti-tuberculosis medications among pulmonary TB patients emphasized the PHC's strategic roles.

4 CONCLUSION

Based on the discussion can be concluded that the characteristics of patients with pulmonary TB,

socio-economic status and residential classification were an influential factor and statistically significant against the use of anti-tuberculosis medications among pulmonary tuberculosis patients in Indonesia.

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