

Analysis Social Determinant of Adherence to Treatment in Pulmonary Tuberculosis Patients in Medan City

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Abstract: Tuberculosis a major public health problems in Medan. The incidence of tuberculosis remains high and cure rate below the target (74.02%). While non-adherence to tuberculosis treatment is still high and impact on high risk of transmission and thereby increasing number of tuberculosis cases. This study investigated factors associated with non-adherence to tuberculosis treatment, including social factors. The study was a case control study with total number of study recruits was 105 at a case: control ratio of 1:2. Data was performed using simple and multiple logistic regressions. The results showed that history of prior treatment, low education level, lack of social support, and poor knowledge were determinant factors for non-adherence to tuberculosis treatment in Medan. Based on these findings, it was recommended to enhance health education regarding tuberculosis treatment as well as provide social support to tuberculosis patients in the treatment period.

1 INTRODUCTION

Tuberculosis (TB) is global health problem and leading causes of morbidity and mortality worldwide. *World Health Organization* (WHO) reported 10.4 millions people are infected with TB with 1.7 million death worldwide in 2016. Majority of TB cases (75%) found in developing countries (WHO, 2017). Indonesia is the second highest for TB cases in the worldwide among 30 high burden countries and TB is the fourth leading cause of death after stroke, coronary disease and diabetes. The incidence of TB is 395 per 100.000 population in 2015 and tend increased in 2016 (WHO, 2016). North Sumatera Province is the fifth rank for TB cases in Indonesia with Medan is endemic area with high incidence of TB (MHI, 2016). According to Ministry of health, number of tuberculosis cases in Medan increased from 5,814 cases in 2014 to 5,861 cases in 2015 (MDHO, 2015).

TB control program with the Directly Observed Treatment Short Course Chemotherapy (DOTS) strategy had been implemented since 1995. This strategy consists of five components and one of the most important component was existence of effective TB drug with the short time as well as presence of supervisors taking medication to ensure patient's adherence to treatment. Unfortunately, non-

adherence to treatment still a problem in TB patient's treatment in Medan. This could affect on the risk of TB transmission and thereby increasing the incidence of new cases and also the Multidrug Resistant Tuberculosis (MDR-TB) cases. WHO estimated there are 490000 people with MDR-TB worldwide in 2016 (WHO, 2017).

Many studies found that factors associated with non-adherence to tuberculosis treatment are poor knowledge, low education level, low socioeconomic, behavior, stigma, lack of social support, adverse drug reaction, history of prior treatment, lack of access to health facility, availability of TB drug, health worker attitude, etc (Tang Y, 2015; Xu W, 2009; Bam T, 2006; Kaona F, 2004)

Medan is endemic area for TB cases with high incidence. Many efforts had been conducted, however incidence of tuberculosis remains high. Furthermore, cure rate below the national target and non-adherence rate in tuberculosis treatment still high. In designing an effective strategies for control tuberculosis and prevent MDR-TB, is necessary to identify factors associated with non-adherence to treatment to reduce number of new tuberculosis cases due to treatment failure. Therefore, this study was undertaken to get information regarding factors associated with non-adherence to tuberculosis treatment to assist health professional to develop an effective TB control strategies.

2 METHODS

This study was conducted from 2th June, 2018 to 31th July, 2018 in six health facilities in Medan City that have non-adherence patients to tuberculosis treatment including Medan Area Health facility, Medan Tembung Health facility, Padang Bulan Health facility, Helvetia Health facility, Petisah Health facility and Teladan Health facility.

2.1 Sample

This study was designed as unmatched case control study. Cases were patients who compliance to tuberculosis treatments and control were patients who not compliance to tuberculosis treatments that registered as TB patients in six health facilities.

2.2 Sample Size

Sample consist of 35 tuberculosis patients who non-adherence to treatment and 70 tuberculosis patients who adherence to tuberculosis treatment. Therefore, the total number of study recruits was 105 at a case: control ratio of 1:2.

2.3 Study Instruments

The socio-demographic data as well as knowledge, social support were collected by interview and recorded using questionnaires administered by the researchers that were developed based on questionnaires published research ((Tang Y, 2015 ; Xu W, 2009; Bam T, 2006; Kaona F, 2004). The socio-demographic factors included age, sex, ethnicity, education level, and income. Income evaluation was performed using the minimum wage standard of Medan city. Knowledge was assessed via thirty three questions regarding cause, symptoms, prevention, drugs and treatment. These questions could be answered with yes (scoring 1 point) and no or do not know (scoring 0 points). Knowledge was classified as good when 70% or more of the answers were correct and low when less than 70% of the answers were correct. For social support was assessed via five questions regarding family support in taking medicine, nutritional, financial support and sputum smear examination. Then, the results were classified using a similar range as for the classification of knowledge.

2.4 Stastical Analysis

Data analysis was performed using the Statistical Package for Social Science (SPSS) Release 22.0 program. To determine risk factor associated with non-adherence to tuberculosis treatment by using Simple and multiple logistic regressions.

3 RESULTS AND DISCUSSION

3.1 Results

Table 1: Socio-demographic characteristic of respondents.

Characteristic	No	%
Age	42.7	15.95
Ethnicity		
Javanese	34	32.4
Batakish	30	28.6
Mandailing	16	15.2
Malaya	6	5.7
Minangnese	14	13.3
Others	5	4.8
Marital status		
Single	65	61.9
Married	32	30.5
Widow	8	7.6
Education		
High	64	61
Low	41	39
Income		
≥ 2.5 million	38	36.2
< 2.5 million	67	63.8
History of TB treatment		
New cases	84	80.0
Retreated cases	21	20.0

A total of 105 samples were included in this study and consisted of 35 TB patients non- adherence to treatment and 70 TB patients with adherence to treatment. The mean (SD) of sample was 42.17 (15.95) years. The Majority were Javanese (32.4%) and married (61.9%). They had new treatment (80%), had high education (61.0%) and came from huseholds with a monthly income less than minimum wages (63.8%) (Tabel 1). Based on the social risk factors, majority of respondent have poor knowledge (59%) and have social support (79.0%) (Tabel 2).

Table 2: The social risk factor of respondents.

Characteristic	No	%
Knowledge		
Good	43	41
Poor	62	59
Social support		
Good	83	79
Poor	22	21

Table 3. Factors associated with non-adherence to treatment in TB patients in Medan Using Simple Logistic Regression.

Variable	Cases n(%)	Control n(%)	Crude OR (95%CI)	p value
Education				
High	16 (45,7)	48 (68,6)	2,591 (1,124;5,970)	0,04
Low	19 (54,3)	22 (31,4)		
Income				
>=2,5 million	12 (34,3)	26 (37,1)	1,133 (0,484;2,649)	0,943
< 2,5 million	23 (65,7)	44 (62,9)		
History of Treatment				
New	17 (48,6)	67 (95,7)	23,647 (6,235;89,69)	0,0001
Retreated	18 (51,4)	3 (4,3)		
Knowledge				
Good	4 (11,4)	39 (55,7)	9,750 (3,109;30,581)	0,0001
Poor	31 (88,6)	31 (44,3)		
Social support				
Good	21 (60)	62 (88,6)	5,167 (1,901;14,04)	0,002
Bad	14 (40)	8 (11,4)		

The results of our simple logistic regression revealed the significant variables with *p-values* less than 0.25 such as education, history of prior treatment, social support and knowledge (Table 3). These significant variables were included in our multiple logistic regression and with the forward method revealed four significant variables with *p-values* less than 0.5 (Table 4). Therefore, history of prior treatment, low education, poor knowledge and social support were risk factors non-adherence to treatment in TB patients.

Table 4: Factors associated with non-adherence to treatment in TB patients in Medan Using Multiple Logistic Regression.

Variable	Cases n(%)	Control n(%)	Adjusted OR (95%CI)	p value
Education				
High	16 (45,7)	48 (68,6)	8.978 (1.739;46.348)	0,009
Low	19 (54,3)	22 (31,4)		
History of prior Treatment				
New	17 (48,6)	67 (95,7)	107.390 (12.698;908.193)	0,000
Retreated	18 (51,4)	3 (4,3)		
Knowledge				
Good	4 (11,4)	39 (55,7)	8.184 (1.496;44,761)	0,015
Poor	31 (88,6)	31 (44,3)		
Social support				
Good	21 (60)	62 (88,6)	8.540 (1.559;46.786)	0.013
Bad	14 (40)	8 (11,4)		

3.2 Discussion

The current study revealed that non-adherence was still high in Medan City. Some previous studies revealed that low treatment adherence among TB patients (Zhou C, 2012 ; Hu D, 2008). A study in Jiangsu Province in China found that 12.2% of patients missed at least 10% of their prescribed doses of anti-TB medication (Xu W, 2009). The similar findings by Kaona study in Zambia and Erawatyningsih study in Subdistrict of Woga in West Nusa Tenggara found that lack of knowledge leading to non-adherence to treatment (Kaona F, 2004 ; Erawatyningsih, 2009). Lack of knowledge regarding tuberculosis prevention measures could affect someone on the risk of tuberculosis infection. This situation could be a problem in TB control strategy and thus need more attention.

Low education could influence the ability of person in receiving information, thus it could affect the level of understanding about pulmonary TB disease, prevention and treatment. In the present study, low education was associated with non-adherence and had a risk of 8.9 times to non-adherence compared to high education. This is consistent to a study in Subdistrict of Woga in West

Nusa Tenggara found that low education was associated with non-adherence to treatment (Erawatyingsih, 2009). Likewise, Xu W study In Jiangsu Province in China found that illiteracy was associated and have risk of 2.42 to non-adherence of treatment (Xu W, 2009).

The role of family support on treatment successes had been studied. Family support increases patients compliance with taking medicine. In this study lack of social support was associated with non-adherence and have a risk of 8.540 times to non-adherence. This is consistent to Than Ying study in Shenzhen, China found that social support was associated with non-adherence (Tang Y, 2015).

4 CONCLUSIONS

This study found that non-adherence to treatment among pulmonary TB patients is still problem in TB control program in Medan and are influenced by many factors such as low education, poor knowledge, history of treatment as well as lack of social support. Poor knowledge about anti-TB treatment could impact on non-adherence to TB treatment, so is crucial to improve knowledge of patients about pulmonary TB treatment. Moreover, social support by family and health workers is necessary.

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