

Involving Local Islamic Leaders (*Teungku*) in Detecting Pulmonary Tuberculosis Suspect in North Aceh District, Indonesia: A Case Study at Endemic Areas of Pulmonary TB in North Aceh District

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Abstract: Tuberculosis (TB) caused by *Mycobacterium tuberculosis* has infected a third of the world's population, Indonesia is categorized as the second most epidemic country. The case detection rate (CDR) of patients with BTA (+) has reached 60% and 3% of TB patients with positive HIV status (Kemenkes RI, 2014). However, in North Aceh District the CDR is very low (44.71%). This study aimed to analyze the effect of involving the local Islamic leaders (*Teungku*) in detecting pulmonary TB suspects. This study is an epidemiological analytic study with case-control research design. This study conducted at two endemic areas of pulmonary tuberculosis namely Nisam sub-district (intervention area) and Kuta Makmur sub-district (control area) conducted from January to June 2016. A total of 160 sample was selected consisted of 80 respondents in intervention group and 80 respondents in control group. Data were analyzed by logistic regression using STATA 12 Program. After the intervention, there was a significantly improved of knowledge, perception and family income among the Islamic religious leaders (Knowledge OR=3,58, $p=0,026$; perception OR=14,06; $p=0,000$) and family income OR=7,49, $p=0,000$). These achievements positively affect to early detection of pulmonary TB suspect. An increase of early check up and TB pulmonary tuberculosis case was found : 58 persons, 13 persons and 5 detected compared to 37 persons, 13 persons and 3 detected with TB pulmonary tuberculosis. It is concluded that involving Islamic religious leaders (*Teungku*) effectively improved knowledge, changing attitudes and perceptions to improve early detection of pulmonary tuberculosis suspects.

Keywords: Islamic Leaders, Pulmonary, Tuberculosis,

1. Introduction

Pulmonary tuberculosis (TB) caused by *Mycobacterium tuberculosis* is one of the most health problem in the world. It is estimated that by 2019 the prevalence of pulmonary TB reaches to 245 per 100,000 population. (WHO, 2015). Indonesia is categorized as the second highest incidence of pulmonary TB in the world (630,000 cases or 272 per 100,000 population) followed by India, China, North Africa and Myanmar (WHO, Global Tuberculosis Report, 2015).

One of the Sustainable Development Goals (SDGs) targets is to end the global TB epidemic. The WHO End TB Strategy targets for a 90% reduction in TB deaths and an 80% reduction in the TB incidence rate by 2030. Global progress depends on major advances in TB prevention and care conducted by the countries. Worldwide, the rate of decline in TB incidence was stagnant at only 1.5% from 2014 to 2015. In order to reach the first milestones of the End TB Strategy, it needs to accelerate to a 4–5% annual decline by 2020. WHO, Global Tuberculosis Report, 2016).

In eradicating TB, Indonesia runs a strategic program by empowering TB patients, community and local religious leaders to detect TB. However, in the last six years the case detecting rate (CDR) is still less than 70%. Among thirty three provinces, only 7 provinces are able to meet the target (Kemenkes RI, 2013). Aceh province is one province that has lower CDR. National Basic Health Research (Riskesdas

2013) found that the prevalence of pulmonary TB in Aceh was 0.3%, means that every 100,000 people, only 300 of them are diagnosed with pulmonary TB. However, based on the symptoms, the prevalence of pulmonary TB with cough is 4.2% and blood coughs 3.5%. This rate is higher than national rate ; 3.9% and 2.8% respectively. While in North Aceh Health District where the research conducted, the number of positive BTA (+) pulmonary TB cases was improving every year, from 43.8% in 2015 to 44.7% in 2016. It was assumed that the community health program conducted had not significantly affected in TB cases.

In Aceh, the daily social life has much affected by Islamic leaders so called *Teungku*. The fanaticism of Acehnese people towards Islam is well-known across Indonesia countries. In Acehnese society, cultural and health practice cannot be separated from the teachings of *Teungku*. Acehnese believe that their way of teachings should be put into practice (Nirzalin, 2012). Therefore, in this study the *Teungku* are recruited and trained to be the health promotion officers. They will be the agent of change and create a synergistic power in the process of transforming healthy lifestyle among societies by earlier detecting the Pulmonary TB cases. This study aimed to study the effect of Islamic religious leaders in detecting the pulmonary tuberculosis case in North Aceh District.

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2. Methods

Study area

The present study conducted in endemic area of pulmonary tuberculosis in North Aceh, one of the endemic district among 23 districts in Aceh Province. North Aceh is the most populated area in Aceh with a total population 541,231. Two sub-districts namely Nisam and Kuta Makmur were purposively selected with total population is 1752 and 862 respectively. In the study areas can be found several health facilities such as hospital, public health centers and clinics.

Study design

This study was an epidemiological analytic study with case-control research design, in which two villages namely Meunasah Meucat and Blang Dalam Baroh Village as the case group area and Keude Blang Ara and Pulo Barat as the control group. The duration of the study was six months started from January until June 2016.

Sample size calculation

Sample size calculation based on *the odds ratio* (OR) and P_2^o (proportion) by considering the previous relevant characteristic variable. A similar research found OR= 4,22 and $P_2^o=0,493$. (Ibal, 2010). Based on these findings, then the sample size calculated using this formula:

$$P_1^o = \frac{(OR)(P_2^o)}{(OR)P_2^o + (1 - P_2^o)}$$

$$P_1^o = \frac{(4,22)(0,49)}{(4,22)(0,49) + (1 - 0,49)} = \frac{2,07}{2,07 + 0,51} = 0,8$$

Using $P_1^o = 0,8$ in sampling calculation, then total sample (n) determined by this formula;

$$n = \frac{\left[Z(1 - \frac{\alpha}{2}) \sqrt{2P_2^o(1 - P_2^o)} + Z(1 - \frac{\beta}{2}) \sqrt{P_1^o(1 - P_1^o) + (P_2^o(1 - P_2^o))} \right]^2}{(P_1^o - P_2^o)^2}$$

$$n = \frac{[1,96 \sqrt{2 \times 0,49 \times (1 - 0,49)} + 1,28 \sqrt{0,8(1 - 0,8) + 0,49(1 - 0,49)}]^2}{(0,8 - 0,49)^2}$$

$$n = \frac{[1,3857 + 0,6402]^2}{0,0961} = \frac{4,1043}{0,0961} = 73,1$$

Total sample size (n) of 73 was the minimum number, inflated by 10% to make total sample to be 80. Therefore, total sample in two locations of the study was 160.

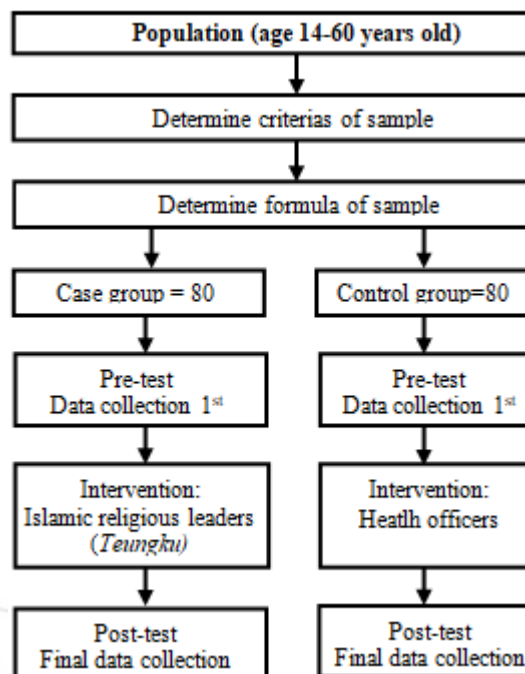


Figure 1: Process of sample selection and data collection

Stages of intervention

Pre-intervention

This research is divided into two stages; pre-intervention and intervention activities. There were several activities conducted; preparing questionnaires, observing the TB case, detecting early pulmonary TB suspect and recruiting Islamic religious leaders (*Teungku*) and health promotion workers. There were eighty questions delivered to measure the knowledge, attitude, perception, health behaviour. The number of *Teungku* recruited was 80 persons from four villages and 80 health promotion workers also were selected from public health centers and clinics in North Aceh District.

Intervention

The training for *Teungku* was conducted for four days involving 80 participants and ten enumerators and three researchers. Each day, the team met the participants for two-three hours. The topics are: characteristics of TB patients, TB early detection, TB medicines. The presentation of TB delivered by researchers then in the group discussion sessions the enumerators were involved.

Collecting data

Data were collected using questionnaires. There were around 70 questions delivered to respondents in both groups consisted of; 16 questions on knowledge, 10, 16 and 18 questions on attitude, perception and health behaviour.

Data analysis :

To analyze the effect of intervention against the knowledge, attitude, perception and health behavior, the logistic regression was run by using STATA 12.

3. Results

Tabel 1 shows that more than half (52.5%) of participants in the case group were male and 51.3% were female in control

group. Most of participants in both groups aged >40 years. In terms of education, employment and monthly income, most respondents in case and control group had low education level, low income (<Rp. 2.000.000/month= USD 160) and worked as farmers. Meanwhile, participants who

ever suffered pulmonary TB were lower in the control group (10.0%) than in the case group (11.8%). Statistical calculation proved that there was no significantly of all characteristics variable between the two groups.

Table 1: Characteristics of respondents in case and control group

Variable	Case group (n=80)		Control group (n=80)		Total	
	n	%	n	%	N	%
Sex						
Man	42	52,5	39	48,7	81	50,6
Woman	38	47,5	41	51,3	79	49,4
Age (yrs)						
20 – 29	14	17,5	10	12,5	24	15,0
30 – 39	11	13,7	18	22,5	29	18,1
40 – 49	22	27,5	26	32,5	48	30,0
50 – 59	33	41,3	26	32,5	59	36,9
Education						
Grade 1-6	47	58,7	54	67,5	101	63,1
Grade 7-12	29	36,3	22	27,5	51	31,9
Grade > 12	4	5,0	4	5,0	8	5,0
Employment						
Farmers	34	42,5	36	45,0	70	43,7
Labour	14	17,5	9	11,2	23	14,4
Government	5	6,3	8	10,0	13	8,1
Private workers	3	3,7	4	5,0	7	4,4
Pensions	3	3,7	6	7,5	9	5,6
Households workers	21	26,3	17	21,3	38	23,7
Income (IRD/month)						
≥ 2 million	36	45,0	41	51,3	77	48,1
< 2 million	44	55,0	39	48,7	83	51,9
No. Family member						
≤ 4 persons	29	36,3	39	48,7	68	42,5
> 4 persons	51	63,7	41	51,3	92	57,5

Table 2: Knowledge, Attitudes, Perceptions, Health Behavior and Early TB Detection in Case and Control group Before and After Intervention

Variable	Before Intervention						After Intervention					
	Case		Control		OR (CI 95%)	P _{value}	Case		Control		OR (CI 95%)	P _{value}
	n	%	n	%			n	%	n	%		
Knowledge												
Good	17	21,25	15	18,75			65	81,25	49	61,25		
Poor	63	78,75	65	81,25	1,16(0,53-2,54)	0,693	15	18,75	31	38,75	2,74(1,34-5,63)	0,006
Attitude												
Good	23	28,75	17	21,25			67	83,75	52	65,00		
Poor	57	71,25	63	78,75	1,49(0,72-3,08)	0,275	13	16,25	28	35,00	2,78 (1,31-5,88)	0,008
Perception												
Positive	23	28,75	20	25,00			50	62,50	33	41,25		
Negative	57	71,25	60	75,00	1,21(0,60-2,44)	0,593	30	37,50	47	58,75	2,37 (1,25-4,48)	0,008
Health Behavior (Teungku)												
Good	21	26,25	19	23,75			62	77,50	45	56,25		
Poor	59	73,75	61	76,25	1,14(0,56-2,34)	0,715	18	22,50	35	43,75	0,99 (0,30-1,67)	0,005
Health Behavior (Health Officers)												
Good	13	16,25	12	15,00			57	71,25	44	55,00		
Poor	67	83,75	68	85,00	1,09 (0,47-2,58)	0,828	23	28,75	36	45,00	2,03 (1,05-3,90)	0,034
Early TB Detection												
Yes	13	16,25	11	13,75			58	72,50	35	43,75		
No	67	83,75	69	86,25	1,22 (0,51-2,91)	0,658	22	27,50	45	56,25	3,39 (1,75-6,56)	0,000

As seen in Table 3 that before intervention there was no significantly different of good and poor knowledge, attitude, perception and health behavior between case and control group ($p>.05$), and the OR range of all variables tested were 0,4-2,9. However, after intervention the OR range improved

to be 1,05-6,56 and the variables were significantly different ($p<.05$)

The next step is the multivariate analysis conducted by connecting several independent and dependent variables at

the same time. It can be estimated that the possibility of participants who checked themselves for early detection of

pulmonary tuberculosis suspects, shown in table 3 below:

Table 3: Multivariate Analysis of Logistic Regression (Unadjusted for SES and Adjusted for SES) of Participants Variables in Early TB Detection

No	Variables	Unadjusted for SES Multivariate Odd Ratio (95% CI)	P-value	Adjusted for SES* Multivariate Odd Ratio (95% CI)	P-value
1.	Knowledge of participants	5,32 (1,82-15,53)	0,002	3,36 (1,02-11,05)	0,046
2.	Attitude of participants	1,55 (0,59-4,06)	0,373	1,18 (0,41-3,39)	0,754
3.	Perception of participants	7,42 (2,97-18,55)	0,000	14,47 (4,38-47,78)	0,000
4.	Health behavior of Religious personages	4,33 (1,86-10,08)	0,001	3,88 (1,60-9,42)	0,003
5.	Health behavior of health officers	1,89 (0,81-4,40)	0,139	1,42 (0,58-3,50)	0,444
6.	Pulmonary TB history	0,37 (0,11-1,23)	0,105	0,11 (0,02-0,52)	0,005

After combining by adjusting SES, variables that significantly related to the increasing number of early detection of pulmonary tuberculosis suspects are knowledge (OR = 3,36; p = 0,046) Perception (OR = 14,47, p = 0,000), Health Behavior (OR = 3,88, p = 0,003), pulmonary TB history (OR = 0,11, p = 0,005), Higher family income (OR = 6,46; p = 0.002).

Table 4: Multivariate Logistic Regression Analysis the Final Model of Three Final Model in Early Detection of pulmonary TB Suspects

No	Final Model	Odds Ratio (95% CI)	P-value
1.	Knowledge about pulmonary TB	3,58 (1,17-11,01)	0,026
2.	Perception about pulmonary TB	14,06 (4,56-43,30)	0,000
3.	Family Income	7,49 (2,43-23,07)	0,000

Table 4 shows the three major variables of change agent model related to the increasing number of early detection of pulmonary TB in North Aceh District namely knowledge (OR: 3,58), perception (OR:14.06) and family income (OR:7,49). The final model shows the most dominant variable related to community empowerment through the agent of change in the early detection of pulmonary tuberculosis suspects is the participants' perception after given intervention by the agent of change of Islamic religious leaders.

4. Discussion

This study found that after intervention there was an improvement on the early detection pulmonary tuberculosis suspects. The religious leaders (Teungku) become more active to detect the TB patients in which the Case Detection Rate (CDR) increased 2% to 40%. 27,88% of patients visited the pulmonary TB clinic after the intervention. This result is similar to a study by Pirkani G.S, et.al. (2007), in Bolochistan, Pakistan on the impact of involving religious leaders on the detection of pulmonary TB showed a significant increase in participants' knowledge. Local religious leaders deliver the message to the community through Jum'ah speech.

Providing education or counseling through Islamic religious leaders as appropriate agents of change could change the people's understanding regarding pulmonary TB. The religious personages of Islam in Aceh play an important role in every aspect of the society and in every message delivered to the community related to the verses of the Qur'an and Al-Hadith.

Likewise, the messages about health, especially diseases by Muslim religious leaders will be accepted easier when the messages were associated with the holy verses of the Qur'an which is connected the incidence of diseases. The people of Aceh are still very fanatic with charismatic Islamic religious leaders in both religious activities and other social activities. Therefore, the role of agents of change of Islamic religious leaders is significantly related to improve knowledge in society understanding the pulmonary TB.

This study found transformation in perception of participants were more positive about pulmonary TB after intervention. This study is consistent with the study by Jadgal et al (2015), among 80 positive pulmonary tuberculosis patients referred to the Chababar health center on the impact of health education based on the health belief model in improving the pulmonary TB positive behavior among patients in Chababar City, Iran. The results showed that cognitive skills improved significantly after intervention. All behavioral skills increased significantly after the intervention. Perceived severity, perceived benefits were also increased significantly.

It was found that there was significant correlation between family income and early detection pulmonary tuberculosis suspects. Study by Rosiana (2013), reported that the income level of the family will affect household spending. The family with income under the Province Minimum Wage (UMP) seen as an economic inability to meet their basic household needs. Moreover, the reality in the field, there is no special program of supplementary feeding for patients with pulmonary tuberculosis are available. In addition, access to health services constrained by transportation costs.

Meanwhile, in the study sites in some communities stated that they did not know that treatment of pulmonary TB free. Whereas one of the pillars of tuberculosis disease prevention with DOTS strategy is with the discovery of treatment as early as possible. It is intended to streamline the treatment of the patient and avoid transmission of contact persons including sub-clinical infections. In this regard Esmael, et.al (2013) has been conducting research on 422 patients with pulmonary TB were aged 18 and over and aims to assess the knowledge, attitude and practice of pulmonary tuberculosis patients in the eastern part of the Amhara region of Ethiopia. The results showed that the majority of respondents had some misconceptions on all aspects of the most infectious form of TB. Approximately half of the respondents did not know that TB diagnosis and treatment is currently being

given free of charge. 69.9% of respondents claim that cost is their main reason for not seeking care.

This finding indicates that Islamic religious person (*Teungku*) may be involved in their role as agents of change for the society, especially changes in behavior and public perception to increase the number of early detection of pulmonary tuberculosis suspects. Perception is the rationale of a person to act, so when Islamic religious leaders provide information about pulmonary TB disease and prevention, those who refer to local Islamic leaders will believe their message, thus so well it will be very easy to recognize all conditions regarding pulmonary tuberculosis and prevention efforts.

This is congruent to the opinion of Nizarlin (2012), the ideological belief that *Tengku* is a person who is privileged by the God, then create the complete obedience and as much as possible the people of Aceh follow them and imitate the pattern of their life. Furthermore, people motivated by the desire to always adopt a way of thinking, speaking and experiencing on the *Teungku* in their life. All parties are doing their best to comply and pleased the *Karamah* personage. Even if there are certain jobs which have to be done by the *Teungku* such as planting rice, planting palm, etc., the society and students ask to be involved and they are competing to do as much as possible due to expect the blessings from the *Teungku*.

5. Conclusions

The role of local Islamic religious leaders (*Teungku*) effectively improve knowledge, attitude, community perception on pulmonary tuberculosis. Government through the District Health Office have to facilitate community empowerment program, particularly in preventing pulmonary tuberculosis through empowering local Islamic leaders.

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