

A Strengthening of Role of Health Cadres in BTA-Positive Tuberculosis (TB) Case Invention through Education with Module Development and Video Approaches in Medan Padang bulan Community Health Center, North Sumatera Indonesia

Roymond H Simamora*

Faculty of Nursing, Universitas Sumatera Utara. Medan Indonesia

Orcid ID: 0000-0003-42745636

Abstract

Tuberculosis in Indonesia in 2015 showed Case Detection Rate of over 70%. While the city of Medan figures patients coverage detection in 2011 amounted to 49.52%. The low detection rate of TB with positive acid-resistant bacillus bacteria in Medan city by case detection rate in 2015 is 43.65%. Therefore, the role of health cadres in TB case detection needs to be strengthened. This study aimed to prove the influence of education with module and video approaches in strengthening the role of health cadre in TB case detection and increase with positive acid-resistant bacillus bacteria. Used an experimental method with sample of 64 people. Samples size of 32 respondents for treatment group and 32 respondents for control group. Data collected using a questionnaires. Analysis used chi-square with a significance level of 5% ($\alpha = 0,05$). Most of the cadres are: women; the highest age group is 21-45 years old. The majority education is high school graduates. The result revealed that age, work period and training TB of health cadres have a relationship with the role of health cadres in TB case finding based on chi-square test with p value 0,031 for age, $p=0,024$ for work period and $p=0,003$ for training of TB; education using Module approach affects the role of health cadres in TB case finding with $p=0,001$ for health cadres, Improvement occurred knowledge of 67 points (74.4%) cadres who have good knowledge before training to 89 points (98.9%). while increasing case detection rate of TB case with positive acid fast bacillus from 6,42% in 2015 to 8,19%. Training affects the role of health cadres in TB case finding with $p=0.001$, while increasing case detection rate of TB case with positive acid-resistant bacillus bacteria from 6.42% in August 2016 to 8.19% in October 2016.

Keywords: health education, training, knowledge

BACKGROUND

Tuberculosis (TB) is an infectious disease caused by bacillus bacteria of *Mycobacterium Tuberculosis*. Tuberculosis particularly attacks lungs which is called pulmonary TB, yet can also invade other organs such as the meninges, kidney, bone, instestine, pleura, bladder and urinary tract as well as lymph nodes which is called extra-pulmonary TB (WHO, 2011). Most of the TB new cases, one of which occurs in Asia, including Indonesia, one of the countries in the Southeast Asia region (Villamor et al, 2008). As a matter of fact, World Health Organization (WHO) in 2014 estimated that about two-thirds of people with TB are not diagnosed as a TB patient making TB cases undetected, consequently patients do not benefit from the TB treatment. The world incidence of TB in 2014 is estimated at 8.7 million (8.3-9.0 million range), equivalent to 125 cases per 100,000 population. Most incidents occur in Asia (59%) and Africa (26%). The world TB prevalence in 2014 is estimated at 12 million (range of 10 million-13 million) which is equivalent to 170 cases per 100,000 population. This prevalence shows that almost one-fifth of the world's population is infected by TB. Global TB disease ranks second as a cause of death from infectious disease after HIV. TB world mortality rate in 2011 was 990,000 people or 14 people per 100,000 population. The HIV-related TB mortality rate is estimated to gain the rate of 0.43 million, bringing the total deaths from TB to be 1.4 million people. The incidence of TB in Indonesia according to estimation is about 380,000-540,000 with estimated point of 450,000 or 189 per 100,000 population. The incidence rate puts Indonesia at number 4 of the world's TB highest incidence in 2011 after India (2,000,000-2,500,000 cases), China (900,000-1,100,000 cases) and South Africa (400,000-600,000 cases).

The prevalence of TB in Indonesia is 680,000 (range 310,000-1,200,000) TB cases which is equivalent to 289 cases per 100,000 population (WHO, 2012). The number of deaths (mortality) of TB is 65,000 people (27 / 100,000 population) meaning that every day there are 175 people who died of TB

*) Special thank to Universitas Sumatera Utara was supported this Study (BOPTN, 2016)

(WHO, 2012; DG & PL, 2014). This condition causes TB to become the second leading cause of death after stroke; and according to Health Research Association data in 2013, TB ranked first cause of death of infectious disease in both urban and rural population. TB has also become one of the main focuses of attention of the provincial government of North Sumatra. Case detection rate (CDR) is included in achieving indicators of the MDGs (WHO, 2012). Case Detection Rate outlines the scope of invention of positive acid-resistant bacillus bacteria Tuberculosis patients in the region. CDR national target of TB control program is at least 70%.

Case Detection Rate of North Sumatra Province in 2015 was 36.6% and the city of Medan was 43.65%, which is still low (not meet the national target of 70% of estimated target) and tended to decrease compared to 2014 about 48.75%. Padang Bulan Puskesmas (Public Health Center) Medan as one of the working area in Medan was also included in low achievement area of 47.62% in 2014. The low TB case detection rate can be caused by various factors; some of which are inadequate surveillance system, not enough ability to diagnose TB, as well as a lack of access to health services (WHO, 2011). The lack of public knowledge about the early symptoms of pulmonary TB and insufficient filtering system assessment in community health center also affect the low suspect covering examined (Medan City Health Department, 2014). Preliminary studies by researchers in June-July 2016 suggested that suspects sometimes did not come back to the health center to submit sputum samples on the 2nd and 3rd tests, signifying poor education to most suspects. Most TB suspects also contributed to the low tuberculosis case detection due to difficulties in discharging sputum despite having been given mucolytic-expectorant medicine resulting unfavorable sputum quality examined. Research of Awusi et al (2009) identified that TB suspect encompassing (OR = 8.92), TB CIE service (Communication, Information, Education) (OR = 8.85) and DOTS Training (OR = 5.84) of community health center officers affect TB case detection and may increase CDR. Naturally, untreated Tuberculosis will show mortality rate of 50% after 5 years, 25% will be self-limited with adequate immunity and 25% will remain chronically infectious cases (DoH, 2007).

This situation indicates the importance of ensuring all TB patients to be found and treated as early as possible; therefore, Tuberculosis case detection is the first step in order that the patients could use the benefit of TB treatment. Care and treatment have very important roles in controlling TB in a way to cure patients and restore patients' quality of life for their productivity, preventing mortality of active TB patients and its long-term effects, preventing TB recurrence, reducing transmission of the disease to others, and preventing the development and transmission of drug resistance which is a serious complication of the disease (WHO, 2003). Hence, the low tuberculosis case detection can lead to an increase in morbidity, disability, mortality and transmission of TB in the

community; increase the possibilities of unsuitable therapies that can increase the number of Multiple Drug Resistance (MDR) TB patients and reduce patients' quality of life with undetected Tuberculosis. Attempts to improve TB case detection rate can be done by the public and all health workers. Efforts sourced from the community generally strengthen health personnels so that the community can also be involved in increasing TB case detection; one of which is through health cadres, which should be considered as partners and colleagues. Health cadres are members of the community trusted to be the manager of public health endeavor (Notoatmodjo, 2010). The efforts to find TB cases in community in order to improve the community health is included in the cadre roles that need to be strengthened, one of which is through cadres education. TB early detection model performed by cadres is consistent with one of the elements of the Stop TB Partnership to stop Tuberculosis that is empowering patients and communities to reduce dependence on the public towards health workers to solve health problems. Filtering Tuberculosis suspects and providing TB CIE services also involve the role of health cadres. Role is a set of individual's behavior expected by others corresponding his/her position in the system (Kozier et al, 2008); therefore, efforts to strengthen the role of behavioral factors are associated with the intervention. Attempts to change behavior in individuals, which are initially less or not aware of the importance of the detection of TB cases, gradually become aware, by using Video and Module educational approach. Learning Media is encouraging cadres to make the detection of TB cases, and the intention is influenced by the attitude toward behavior, subjective norms and perceived behavioral control.

Education is expected to increase knowledge to form a positive attitude towards the detection of TB cases, subjective norm and PBC which eventually increases the intention of conducting TB case finding (Wahyuni, 2012). Various intervention programs have been studied in relation to efforts to improve TB case detection rate, but the intervention program involving health workers in carrying out its role in health centers uses behavioral change approach based on the use of modules and video which still remain limited. Therefore, strengthening the role of health workers in TB case detection through education with the development of modules and video approaches is expected to improve TB case-finding behavior while increasing detection rate of positive acid-resistant bacillus bacteria TB. The purpose of this study is to clarify the effect of strengthening the role of health workers through education based on the use of modules and video approaches to add cadres' knowledge about TB case detection.

RESEARCH METHODS

The study design is experimental. The type is pre-test & post-test group design which involves two (2) groups of subjects, namely the treatment group and the control group without randomization. The population in this study is all health cadres in Padang Bulan community health centers, Medan. The samples are 32 people which each treatment group and control group are selected from the population that met the inclusion criteria, which become 64 people. Data collection concerning the characteristics of the respondents and role in TB case detection are carried out by interview with a questionnaire. Other supporting instruments are TB Module and Video and role in the TB detection, TB early detection cards by cadres, list of suspected tuberculosis patients that were examined in Padang Bulan Community Health Center, Medan. The treatment is given in the form of Strengthening the Role of Health Cadres in the detection of positive acid-resistant bacillus bacteria Tuberculosis through Education with Module Development Approach and Video Media conducted August-September 2016 that consists of 4 meetings each for \pm 60 minutes in Padang Bulan Community Health Center Medan and also health cadres' houses. Data analysis uses non-parametric statistics. Wilcoxon Signed Rank Test was used to look at differences in the role among the health workers in TB case detection results in both pre-test and post-test in the treatment group and the control group. Chi-square

and Fisher's Exact Test were used to see the relationship between the respondents characteristics (age, education, employment period and TB / DOTS training period) and the respondents' role in the detection of TB cases. The alternate hypothesis is accepted if $p < 0.05$.

RESULTS

Most cadres are in the age group of 21-45 years and the least are in the group of 46-55 years. Cadres in the older age group are more active because it provides them a lot of time in the morning and there is a commitment in their neighborhood. The majority of cadres' education is high school graduates: 39 people. (Table 1).

Relationship between characteristics of health workers and the role of health cadres in TB case detection

Characteristics of health cadres to be analyzed are age, latest education, employment period and TB / DOTS training. Statistical analysis of the relationship between characteristics of health workers and the role of health workers in Tuberculosis case can be seen in Table (1)

Table 1. Relationship between the characteristics of health workers and role in tuberculosis case detection after education in Padang Bulan Community Health Centers, August-September 2016

Health Cadres Characteristics	Role in TB detection						Total		<i>p value</i>
	Good		Average		Poor		F	%	
	F	%	f	%	f	%			
Age									
21-35	17	26	11	17	0	0	28	44	0,031
36-45	14	22	13	20	1	2	28	44	
46-55	5	8	1	2	2	3	8	12	
Total	36	56	25	39	3	5	64	100	
Education									
Junior HS	15	23	6	9	2	3	23	34	0,505
Senior HS	20	31	18	28	1	2	39	61	
Graduates	1	2	1	2	0	0	2	3	
Total	36	56	25	39	3	5	64	100	
Employment Period									
1-5 Years	18	28	17	26	1	2	36	56	0,024
6-10 Years	10	15	4	6	0	0	14	22	
11-15 Years	5	8	3	5	0	0	8	13	
15-20 Years	3	5	1	2	2	3	6	9	
Total	36	56	25	39	3	5	65	100	
TB/DOTS Training									
No	10	14	15	23	3	5	26	41	0,003
Yes	26	42	10	16	0	0	38	59	

Total	36	56	25	39	3	5	64	100
-------	----	----	----	----	---	---	----	-----

Table 1 above gives information that the results of statistical analysis using chi-square test to look at the relationship between age and the role of health workers in TB case detection obtains the result of 0,031 $p < 0.05$, which means there is a significant correlation between age and the characteristics of the role of health workers in TB case finding in Padang Bulan Community Health Center, Medan. Statistical analysis using chi-square test to look at the relationship between Education History and role of health workers in TB case finding obtains the result of $p\text{-value } 0.505 > 0.05$, which means there is no significant relationship between the characteristics of the education and the role of health workers in TB case detection in Community Health Center of Padang Bulan, Medan. Statistical analysis using chi-square test to look at the relationship between tenure and the role of health workers in TB case finding obtains the result of $p\text{-value } 0.024 < 0.05$, which means there is a significant correlation between the characteristics of tenure (employment period) and the role of health workers in TB case detection in Padang Bulan Community Health Center, Medan. The result of statistical analysis using chi-square test to see the relationship between TB / DOTS training and the role of health workers in TB case finding obtains $p\text{-value } 0.003 < 0.05$, which means there is a significant relationship between the characteristics of the training of TB / DOTS and the role of cadres health in TB case finding in Padang Bulan Community Health Center, Medan. Knowledge is a very important factor in shaping a person's actions, behaviors based on knowledge will last longer than those without it. Knowledge of cadres about pulmonary TB before training shows the lowest score of 67 (74.4%) and after training of 89 (98.9%) (Table 2).

Tabel 2. Cadres' Knowledge Distribution about TB Before and After Training

Test Model	Lowest Score	Highest Score
Pretest	67 (74.4%)	90 (25.6%)
Posttest	89 (98.9%).	100 (1.1)

Effect of education with Video and Module approaches on the role of health workers in TB case detection

The results of research concerning the role of health workers in TB case finding showed that before education in the treatment group, most cadres (68.7%) are in the category Average, increasing after education to category Good. The results of the study in the control group of pre test show that the majority (53.2%) are in the category Average and post test results indicate most are still in the category Average. The data are presented in Table 3.

Table 3. Frequency Distribution Role of Health Cadre in the detection of TB cases in community Health centers Padang Bulan Medan, August-September 2016

Health Cadres' role in TB case detection	Treatment Group				Control Group			
	Pre test		Post test		Pre test		Post test	
	F	%	f	%	f	%	f	%
Good	10	31,3	25	78,2	11	34,3	11	34,3
Average	22	68,7	7	21,8	17	53,2	18	56,3
Poor	0	0,0	0	0,0	4	12,5	3	9,4
Total	32	100,0	32	100,0	32	100,0	32	100,0
<i>Wilcoxon Signed Rank Test (pre-post in-group)</i>	<i>p = 0,001</i>				<i>p = 0,387</i>			
<i>Mann-Whitney Test (post only among groups)</i>	<i>p=0,001</i>							

Table 3 above shows that the role of health workers in TB case finding post test results in the treatment group are mostly Good (78.2%), whereas the control group mostly are Average (56.3%). Results of Wilcoxon Signed Rank Test to see the difference in the results of pre-test and post-test in the experimental group showed a difference in the role of health workers in tuberculosis case with $p = 0.001$ ($p < 0.05$), whereas the control group did not show any differences with $p = 0.387$ ($p > 0.05$). Results of Mann-Whitney Test to see any difference in post test results in the treatment group and the control group showed the value of $p = 0.001$ ($p < 0.05$), which means there are significant differences between post-test results in the treatment group and the control group.

DISCUSSION

Relationship between characteristics of health workers and the role of health cadres in TB case detection

Age

Most health cadres of 21-35 years old have a good role in the detection of TB cases. Statistical test results stated that there is significant correlation between age and the characteristics of the role of health workers in tuberculosis case after strengthening activities through Module and Video. Older age cadres are generally more responsible and more careful than younger ones. Age is also closely related to the level of

maturity. Maturity is the adulthood in performing technical tasks and psychological maturity (Elias, 1999). The rise in age will also increase the person's ability to make decisions, control emotions, think rationally, and be tolerant for the views of others. Perry & Potter (1997) stated that age greatly affects a person's thinking and behavior.

The significant association between age and the role of health cadres in TB case finding in this study is because with the increase of age, the level of maturity in thinking and behavior also increase so that decision-making action can be performed more wisely to keep doing the role well, even though working as health cadres more involve the element of volunteerism. Age maturity also contributes to the increased responsibility and emotional control in the face of challenges in society so that the cadres can still perform the role well. Therefore, age indeed affects a person's thinking and behavior. Another supporting factor is public trust that supports the implementation of the role of health cadres, in which older cadres tend to be more trusted by the public because they are considered to be more experienced and mature in order to facilitate the implementation of the role, especially when dealing with older adults. Thus, the recruitment of health cadres should consider the age factor that is to recruit cadres with older age so the cadres will be more mature and wiser in performing their role in the detection of TB cases.

Education

Almost most of health cadres with high school education have Good and Fair role category in the detection of TB cases. The test results revealed no statistically significant relationship between education and the role of health cadres in Tuberculosis case detection in Padang Bulan Community Health Center, Medan. Research by Andari et al (2008) concerning factors related to the performance of cadres in Posyandu (Integrated Health Service Post) activities in Bulukumba also supported that there was no relationship between age, incentives, and training frequency and work performance. However, different result from another study was presented by Wahyutomo (2010) which stated that education, tenure and training period was significantly associated with toddlers growth monitoring at Kalitidu Community Health Center, Bojonegoro.

The finding above in this study is partly caused by the majority of the respondents that were women with roles mostly as housewives that want to keep showing good role that will give a positive image for the clinic, as a form of remuneration to the health center which has provided occupation to them, despite the low level of education. Another causative factor is due to the cadre recruitment who have been running the safety credibility aspect for those who are trusted or respected in society, regardless of the education level. Supported by this belief, the health cadres will also have

the desire to provide the best for the community by running the role as reliable cadres. Maintained by additional knowledge that has been given during the previous occupation as cadres, the role implementation is expected to work well even with the level of secondary education.

Tenure

Most health workers with years of service of 6-10 years are in the Good role category in TB detection and statistical test showed there is a relationship between characteristics of tenure and the role of health workers in Tuberculosis case detection at Padang Bulan Community Health Center, Medan. The result of the study is consistent with the results of research by Prabandari et al (2009) stating that there is a significant relationship between tenure and the motivation of cadres in the detection of pulmonary Tuberculosis in Barito Kuala; and research by Andari et al (2008) stated that the period of employment has a significant relationship with the performance of cadres in Bontobalan District Posyandu, Bulukumba. Longer tenure enables more experience and skills in running more roles that can also guarantee work productivity.

Robbins (2008) stated that the work experience will ensure good productivity. Work experience is supported by work motivation, skills and a good working atmosphere that will guarantee a good working productivity as well. The association between tenure and the role of health cadres in TB case finding, according to the theory discussed earlier, is due to a longer years of service which allows the obtainment of more experience and skills in performing their duties and roles as health educators in the community. Work experience supported by the motivation and skills can support the implementation of the role, especially for health cadres whose activities are closely related to people's behaviors that are sometimes difficult to guess; so when the cadres already have experience in dealing with various situations in the community, it will be easier to handle and run the of the role as cadres to be easier. Long tenure also allows health cadres to get training of community health centers that will increase knowledge and skills as a manager in public health efforts. Therefore, health cadres should not be frequently changed along with the change the head of environment in order to allow health cadres to have a long tenure.

TB / DOTS Training

Health cadres who attended TB/DOTS training mostly have Good role in the detection of TB cases and statistical test showed a significant association between training of TB/DOTS and the role of health cadres in TB case detection. The result supports the research by Wahyutomo (2010) which stated that the training of health cadres is associated with

toddlers growth monitoring at Kalitidu Community Health Center, Bojonegoro. The significant correlation between training TB / DOTS and the role of health cadres in TB case finding in this study is because health cadres are one form of community participation in the health sector so that the training of TB / DOTS is an absolute requirement so that health cadres can have the knowledge and skills to be able to implement the role in TB control, including TB case finding. Increased knowledge and skills about Tuberculosis and training TB / DOTS resulting in TB control will greatly help the health cadres who were originally general citizens to be able to perform tasks in TB control well. Thus, it is expected that every health cadre especially who manages the TB control to be given training or seminar on TB control in the community so they can perform the role in a good way, especially in increasing Tuberculosis case detection.

Effect of education with Video and Module approaches on the role of cadres in TB case detection

The research showed that most of the role of health cadres in tuberculosis case pretest perceived enough and there are significant differences between the role of health workers in tuberculosis case before and after education using approaches Module and Video, and thus there is the influence of education by using the approach Theory of planned behavior to the role of health workers in TB case finding. The results of this study prove that through a change or increase health worker knowledge about TB and TB case-finding role in behavior change can occur health cadres role in the detection of TB cases, which indeed is the purpose of education / health education in this study. Results of research also involves health workers represented by Trisnawati et al (2008), which examines the capacity building training health workers in TB control to conclude that there is an increased knowledge of health workers after training so expect health workers can disseminate information and their skills to TB patients, their families or people around these cadres. The results of the study one year pulmonary TB control network intervention by Tjekyan (2008) which also involves the training of cadres Neighborhood TB rate in addition to many other targets showed an increase in case detection rate (CDR) cases of TB were far higher than the control group.

Results of previous studies have revealed a link between knowledge, attitudes and motivation of cadres ie research Wijaya et al (2013) which states that there is a statistically significant relationship between knowledge, attitude and motivation with the activities of health workers in the control of TB cases in Buleleng. Their knowledge enables high cadres cadres to actively carry out their activities in the prevention of TB cases 18 times greater than if the lower cadre of knowledge. The results of the study reinforces previous research by Nugroho (2008) in Wijaya et al (2013) which states there is a relationship of knowledge to liveliness

Posyandu cadres, research by Saputro (2009) in Wijaya et al (2013) which states there is a relationship between knowledge and attitudes health cadre of pulmonary TB with the invention with pulmonary tuberculosis in Puskesmas Plupuh I Sub Plupuh Sragen, Central Java Province, and research by Wahyudi (2010) in Wijaya et al (2013) which states that the knowledge of cadres is one of the factors related to the invention Pulmonary tuberculosis suspects in Puskesmas Sanankulon

Health cadre is one form of community participation in Primary Health Care were developed through Posyandu, the citizens who elected and given health skills provision through the local health clinic. The role of cadres as a driver or a manager of primary health efforts in the community will be able to develop and operate optimally if the competent cadres have credibility, the ability or skills in the health sector followed appropriate training in health centers, and safety credibility, the trust of the public. Credibility is important for cadres to develop its role to manage a primary health efforts. Satisfaction arises when cadres feel that credibility increased with his experience as cadre (Notoatmodjo, 2010). Education is an effort of persuasion to the community to take measures to maintain and improve health. Health education will result in a change or maintenance actions and health improvement based on knowledge and awareness through a learning process, which is expected behavior would be long and persistent. Knowledge of health workers is a very important determinant as the basis for health cadres in carrying out activities for TB control. His is in line with the theory of Lawrence Green stated that the factors that facilitate or predispose the person's behavior, among others, is knowledge. The general objective of health education is to change the behavior of individuals and communities in the health sector through changes or improvements to public knowledge (Notoatmodjo, 2007). An increase in the results of post-test compared to pre-test in this study due to education about TB and TB case-finding approach Modules and Video can increase the credibility of cadres in terms of capabilities (Competent credibility), so volunteers have the knowledge and skills to grow in terms of TB disease and TB case-finding in the community, thus a cadre capable of providing technical advice to the people who need them. Provisions will further credibility to effectively assist cadre role, especially in tuberculosis case namely: provide health education to the public related to TB, capture suspected tuberculosis in the community, and refer suspected TB to the clinic for treatment. Education can also help self-actualization cadres. Other factors are the majority of recruitment which has been running for health cadres due respect to the credibility of trust (safety credibility), namely by recruiting cadres who previously had been a public figure respected / trusted, among others, is the wife of the head of the neighborhood, or family members of the community head. With the provision of its credibility is an important thing to be able to run and develop its role to

manage the eradication of TB disease.

Aspect	Treatment Group	Control Group
Positive acid-resistant bacillus bacteria (BTA) TB detection rate 2015 (%)	38,52	39,34
The average detection rate of BTA TB per 2 months (%)	6,42	6,55
BTA TB new patients + August-October 2016	10	8
Suspects estimation/year	122	122
Positive acid-resistant bacillus bacteria (BTA) TB detection rate of August-October 2016 (%)	8,19	6,55

The increasing role of health workers in tuberculosis case at the post test is also a result of their treatment in the form of provision of knowledge about the disease concept of TB, activities that can be performed by a cadre of TB case finding and techniques that help in the detection of cases of TB were given during treatment with the lecture method question and answer, discussion, counseling as well as demonstrations by taking into account aspects of attitudes toward behavior and perceived behavioral control using leaflets media. The treatment is persuasive facilitate the learning process in self health workers in order to increase their knowledge so that the consciousness will do the detection of TB cases in the community and resulted in increased TB case-finding in the community. Methods of education with counseling also supports the improvement of the results of post test is due to communicate directly through home visits health volunteers make contact with health workers to be closer and more intensive namely through four (4) meetings in an atmosphere closer, so openly cadres can reveal the difficulty in tuberculosis case is therefore assisted completion.

Cadres training and education enable early detection of TB cases performed by the cadres; it is consistent with one of the elements of the new WHO strategies to stop TB: empowering patients and communities. Efforts have been made in this study to enhance the role of the volunteer in TB case detection: providing information about TB case finding with lectures, discussions and demonstrations, distributing leaflets to cadres and encourage them to use it in providing public health education, encouraging cadres to actively seek information about their suspect detection through meetings in the community, encouraging cadres to provide TB health education to the community at every opportunity and discussing the ease and difficulties encountered during the implementation of the role of TB case finding. Other efforts in

accordance with the TPB is to provide referents, in this respect are the heads of community health centers, and TB program officers in education in order to shape subjective norms that support the implementation of role in TB case detection and increase the motivation to meet the expectations of the referents.

Effect of strengthening the role of health cadres through education with Module and Video approaches on positive acid-resistant bacillus bacteria TB detection rate.

The results of the research in the treatment group showed an increase during August-September 2016 compared to the 2 months in the previous year, whereas the control group showed detection in a constant rate like the average of the previous year. The data are presented in Table 4.

Table 4 above gives information that there was an increase in the detection rate of Positive acid-resistant bacillus bacteria (BTA) TB during August-October 2016 which increased to the point of 8.19% compared to the 2 months average in the previous year of 6.42%. Another finding in this study is that there was a suspect whose sputum checks are negative twice of the acid-resistant bacillus bacteria; therefore, the patient was then referred to the hospital due to prolonged cough which X-ray then showed positive Tuberculosis. Another suspect also showed scanty sputum result with the second examination showing negative result, but because of the prolonged cough, the suspect was referred to the hospital which was proven positive TB by using X-ray. The presence of the suspects unwilling to undergo health examination to the clinic, based on information from cadres, are still encountered in the study. Some of the excuses are a confidence that they didn't suffer from TB, little time because of work, waiting for the cadres to bring the suspects to the clinic and also economic excuse, especially if the suspects need to be referred to the hospital because some suspects who are financially deprived do not have national health insurance membership.

Effect of strengthening the role of officers and health cadres in positive acid-resistant bacillus bacteria (BTA) TB case detection through education with Video and Module approaches

The result of the study (Table 3) provides descriptive information that there was an increase in the detection rate of positive BTA TB cases during August-September 2016. These results prove the effect of strengthening the role of officers and health cadres in TB case detection through education with Module and Video approaches impacting the increasing implementation of the role of officers and health cadres to find TB cases by increasing the health education related to TB, covering suspected tuberculosis in the community or polyclinic, and the referral of suspected TB to the clinic by a

cadre that leads to an increased detection rate of positive acid-resistant bacillus bacteria TB than average of 2 months in the previous year.

The research result by Datiko et al (2009) stated that the training of health cadres can increase the number of suspect cases with BTA positive and increase the success rate of TB cases. Another related research using more diverse respondents containing private doctors, government, community and religious leaders and TB cadres with a longer research period was performed by Tjekyan (2008), which examined the results of the intervention of one-year network Pulmonary TB control in Ilir II District, Palembang, that showed a very high increase in CDR (88.4%) compared to the control group (15.6%) with a value of $p = 0.000$. A significant relationship between community cadres training and the number of suspected TB DOTS covered in Tuban Community Health Center has also been identified by Munir (2007). Based on a research by Awusi et al (2009), the factors that affect tuberculosis case detection are the TB suspects screening, health education about TB and DOTS training from TB program officers. TB education and role in TB case detection by officers and health cadres facilitate the progressive increase in knowledge, positive attitudes towards TB case finding, subjective norms shaping, and also positive perceived behavioral control in order to increase the screening of Tuberculosis suspects, CIE (education) provision and TB suspects' referral by cadres. Educational activities also enhance the skill of the respondents about effective cough which is an effective technique to help overcome the difficulties of producing sputum that is often faced by the suspects. Hariadi et al (2009) have identified that the skills of officers and health cadres are also related to the coverage of patients with positive acid-resistant bacillus bacteria TB.

Suspect covering activity that had been undertaken by the health community center is through an examination of TB patients' family members living in the same house and CBA (Community Based Approach) activity which are usually carried out every three months by choosing the environment with most TB suspects or patients. CBA is held for 2 days which on the first day, health officers provide TB health education to the cadres, community leaders, religion leaders, suspects with cough symptoms and phlegm for 2 weeks, followed by sputum pot distribution to the citizens, then on the second day suspects are asked to bring the filled sputum pot. The results of CBA are still not optimal partly due to the quality of sputum pots collected are not adequate enough because of insufficient contents that sometimes are saliva only. Therefore, with educational activities to officers and health cadres, it is expected to improve knowledge and skills of health workers to provide technical advice related to the problems in the community, especially to improve the quality of sputum examined.

Education undergone in every week for 2 months also allows

monitoring of the progress of the tuberculosis suspects detection that has been achieved and also discussion about the obstacles encountered and the problem-solving solutions. Coordination between TB officials and health cadres to find more tuberculosis cases also works better with education as a treatment in this study; for example, tuberculosis suspects outside the working area of health cadres can be known so that will be informed to the other health cadres in the same working area to be followed up. Research by Budi et al (2013) identified that coordination contributed to TB suspects finding.

TB suspect detection to improve the detection rate of TB requires sputum examination results used to establish a diagnosis; thus, the presence of laboratory facilities and skilled workers are required. Community health center on treatment group has had 2 properly functioning microscopes, reagents and standard sputum pots that are distributed from the health department with sufficient quantities; therefore, the skills of laboratory officers in analyzing the supply to determine the results of the examination for the purpose of diagnosis is very important, besides the quality of examined sputum. The low detection rate of positive acid-resistant bacillus bacteria TB cases in this study is partly because some suspects showed negative results of sputum examinations; but when referred to the hospital from a prolonged cough showed positive results from X-ray examinations.

Other suspects indicate the *scanty* results meaning 1-9 BTA are found in the 100 fields of view and can not be categorized as a +1, so the second sputum examinations are undergone which showed negative results. They were eventually referred to the hospital where x-rays showed TB positive. This is consistent with research of Hariadi et al (2009) stating that the skills of health workers, training of health personnel and the available facilities are associated with the coverage of patients with positive acid-resistant bacillus bacteria TB. The presence of suspects still reluctant to consult to health centers, based on health cadres information, can be influenced because of stigma in some regions about Tuberculosis so that the suspects do not want to be known or diagnosed with TB. The other excuses are because of economic factors and the bustle of the work, especially for financially deprived suspects who need to work daily. If they go to the clinic for a check, they have to leave work which will risk the loss of daily income that make the suspects also reluctant to check to the clinics. The presence of Jamkesmas (National Health Insurance) cards so that the poor suspects can obtain free health services is very helpful, but the problem arises when some of them do not have health cards, so they do not want examination in health-care facilities, especially if referred to the hospital, because they don't have the money. There are also areas that are still waiting for health volunteers to deliver them for examination in the clinic; when on the other side, the cadres also have a responsibility for their own families; as a result, society independence about health should also be improved.

CONCLUSIONS

From the results of this study, it can be concluded that age, years of service and TB / DOTS training of health volunteers had a significant association with the role of health workers in TB case detections in Puskesmas (Community Health Center) in Padang Bulan, Medan. The other conclusion is that education with Video and Module approaches is proven to have an effect on the health worker's role in TB case detection in Padang Bulan Community Health Center Medan and can increase the detection rate of positive acid-resistant bacillus bacteria TB in Padang Bulan Community Health Center Medan.

RECOMMENDATIONS

The results of the study could be used as a scientific basis for health cadres to always improve their knowledge and skills in TB case detection through seminars, training and others and also increase the role in Tuberculosis case detection rate in order that the community health centers can achieve the national target. In addition, it is expected that the management of the health centers always conduct the coordination and monitoring to observe the number of suspect cases examined and the number of people with TB so that the necessary measures can be performed to achieve the target of new TB with positive acid-resistant bacillus bacteria. The City Health Department, represented by the health centers, can also optimize health promotion to the public in the fight against infectious diseases, especially lung TB through scheduling counseling activities on a regular basis using a variety of instructional media such as leaflets, booklets, posters and banners, as well as providing adequate budget for the implementation. Further studies are necessary to be conducted involving the management of health centers as well as the local health authorities to improve TB case detection and use the check list to improve the objectivity of the questionnaire.

BIBLIOGRAPHY

- [1] Aditama, T., & Soepandi, P. (2000). *Tuberkulosis: Diagnosis, terapi dan masalahnya edisi 3*. Jakarta: Lab Mikobakteriologi RSUP Persahabatan/WHO Collaborating Center for Tuberculosis.
- [2] Ajzen, I. (1991). *The theory of planned behaviour*. Organizational Behaviour and Human Decision Processes. Massachusetts, USA. Diambil kembali dari <http://people.umass.edu/psyc661/pdf/tpb.obhdp.pdf> Juni 2016.
- [3] Ajzen, I. (2006). *Theory of planned behaviour*. Dipetik Maret 16, 2013, dari TPB Diagram: <http://people.umass.edu/ajzen/tpb.diag.html#null-link>.
- [4] Alisjahbana, B., Crevel, R., Danusantoso, H., Gartinah, T., Soemantri, E., & Nelwan, H. V. (2005). Better patient instruction for sputum sampling can improve microscopic tuberculosis diagnosis. *Int Journal Tuberculosis Lung Disease Vol. 9*, 814-817.
- [5] Almatsier, S. (2004). *Penuntun diet*. Jakarta: Gramedia Pustaka Utama.
- [6] Awusi, R., Saleh, Y., & Hadiwijoyo, Y. (2009). Faktor-faktor yang mempengaruhi penemuan penderita TB Paru di Kota Palu Provinsi Sulawesi Tengah. *Berita Kedokteran Masyarakat Vol. 25 (2)*, 59-68.
- [7] BAPPEDA. (2012). *Musrenbang RKPD 2012*. Dipetik Agustus 2016, dari Dinas Kesetahan Provinsi Sumatera Utara: <http://provsu.go.id>
- [8] BAPPEDA. (2012). *Musrenbang RKPD 2012*. Dipetik Juni 2016 dari Bappeda Sumut: <http://bappedasumut.go.id>.
- [9] Borgdorff, M., Floyd, K., & Broekmans, J. (2002). Intervention to reduce tuberculosis mortality and transmission in low and middle - income country. *Bulletin of World Health Organization Vol.80 (3)*, 217-227.
- [10] CDC. (2012). *Basic TB facts*. Dipetik Agustus, 2016, dari www.cdc.gov.
- [11] Chrisanthus, W. (2010). *Efektifitas batuk efektif dalam pengeluaran sputum untuk penemuan BTA pada pasien Paru di ruang rawat inap Rumah Sakit Mardi Rahayu Kudus*. Thesis. Dipetik Agustus 25, 2016, dari Undip website: <http://eprints.undip.ac.id>.
- [12] Crofton, J. (1999). *Clinical tuberculosis*. London: MacMillan Education Ltd.
- [13] Depkes. (2007). *Pedoman nasional penanggulangan tuberkulosis*. Jakarta: Depkes RI.
- [14] Dinkes. (2012). *Profil kesehatan Kota Mataram tahun 2011*. Mataram: Dinas Kesehatan Kota Mataram.
- [15] Ditjen PP & PL. (2011). *Laporan situasi terkini perkembangan tuberkulosis di Indonesia Januari-Juni 2011*. Jakarta: Kementerian Kesehatan RI.
- [16] Hernawan, A. H. (2012). *Teknik penyusunan modul pelatihan pdf document*. Program Studi Teknologi Pendidikan FIP: UPI.
- [17] Hurlock, E. (2004). *Psikologi perkembangan*. Jakarta: Gramedia Pustaka.
- [18] Ilyas. (1999). *Kinerja : Teori, penilaian, dan penelitian*. Depok: Badan Penerbit FKM UI.
- [19] Indriyanti., Yunita, N., & Susilowati, E. (2010). *Pengembangan modul*. LP2M: Universitas Sebelas Maret.
- [20] Khan, M., Dar, O., Sismanidis, C., Shah, K., & Godfrey-Fausset, P. (2007). Improvement of tuberculosis case detection & reduction of

- discrepancies between men & women by simple sputum submission instruction: a pragmatic randomized controlled trial. *The Lancet Volume 369*, 1955-1960.
- [21] Notoatmodjo, S. (2007). *Kesehatan masyarakat ilmu & seni*. Jakarta: Rineka Cipta.
- [22] Notoatmodjo, S. (2010). *Promosi kesehatan teori dan aplikasinya (edisi revisi)*. Jakarta: Rineka Cipta.
- [23] Permenkes no. 19 tahun 2011 tentang pedoman pengintegrasian layanan sosial dasar di posyandu. Jakarta.
- [24] Potter, P.A., & Perry, A.G. (2009). *Fundamental of nursing (7th edition)*. Jakarta: EGC.
- [25] Prastowo, A. (2011). *Panduan kreatif membuat bahan ajar inovatif menciptakan metode pembelajaran yang menarik dan menyenangkan*. Yogyakarta: DIVA Press.
- [26] Prabandari, Y. S., Hasanuddin. (2009). *Motivasi kader dalam penemuan penderita TB Paru di Kabupaten Barito Kuala*. Tesis. Dipetik Juli 13, 2016 dari Electronic Thesis & Dissertation Gadjah Mada University : <http://etd.ugm.ac.id>.
- [27] Sugiyono. (2011). *Statistika untuk penelitian*. Bandung: Alfabeta.
- [28] Trisnaniyanti., Prabandari, Y. S., & Citraningsih, Y. Persepsi dan aktifitas kader PSN DBD terhadap pencegahan dan pemberantasan DBD. *Jurnal Berita Kedokteran Masyarakat Vol. 26 No.3*, 111-129.
- [29] Trisnawati, A., & Rahayuningsih, F. (2008). Pelatihan peningkatan kemampuan kader kesehatan dalam penanganan Tuberkulosis (TBC) di wilayah kerja Puskesmas Gemolong II Sragen. *Journal Publikasi Ilmiah Vol. 11 No. 2*, 150-158.
- [30] Villamor, E., Mugusi, F., & Urassa, W. (2008). A trial of the effect of micronutrient supplementation on treatment outcome, T cell counts, morbidity, and mortality in adults with pulmonary tuberculosis. *The Journal of Infectious Disease Vol. 197*, 1499-1505.
- [31] Wahyuni, E. (2012). Pengembangan model perilaku perawat dalam pendokumentasian asuhan keperawatan berbasis Theory of Planned Behaviour di RSD Mardi Waluyo Kota Blitar. *Tesis Program Studi Magister Keperawatan UA*.
- [32] Wahyutomo, A.H. (2010). *Hubungan karakteristik dan peran kader posyandu dengan pemantauan tumbuh kembang balita di Puskesmas Kalitidu, Bojonegoro*. Tesis. Dipetik dari <http://eprints.uns.ac.id> Tanggal Agustus 2016.
- [33] Wahyutomo, A.H. (2010). *Hubungan karakteristik dan peran kader posyandu dengan pemantauan tumbuh kembang balita di Puskesmas Kalitidu, Bojonegoro*. Tesis. Dipetik dari <http://eprints.uns.ac.id> Agustus 2016.
- [34] WHO. (2012). *Global tuberculosis control : WHO report 2011*. Geneva, Switzerland: WHO Press.
- [35] Wilson, M., Murti, B., & Suriyasa, P. (2006). Hubungan pengetahuan, sikap dan motivasi kader kesehatan dengan aktifitas dalam pengendalian kasus TB di Kabupaten Buleleng. *Jurnal Magister Kedokteran Keluarga Vol. 1 No. 1*, 38-48