

## Evaluation of Community Health Volunteers Training on Early Detection Skills of Pulmonary Tuberculosis

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### ABSTRACT

**Background:** achievement of coverage numbers of cases of pulmonary TB cases that meet the target impact on the prevention of disease transmission, complications, and even death due to pulmonary TB. Increasing the capacity of community health volunteers as partners of health workers in the early detection of pulmonary TB becomes a program that needs to be considered. Purpose: this study aims to identify the effect of community health volunteer training on the early detection of pulmonary tuberculosis.

**Methods:** the study design used quasi-experimental pre-test and post-test types with a control group. The study was conducted in February-March 2020 in the working area of the Kutowinangun Primary Health Care Facilities. The total sample of 32 community health volunteers for each intervention and control group was selected by purposive sampling based on inclusion and exclusion criteria. The instruments used were observation sheets and modules developed by researchers. The training was conducted in 5 sessions over 5 days with a duration of 60 minutes per session. Data analysis using paired t-test and independent t-test. This research has passed the ethical test from the Ethics Committee of the Faculty of Public Health, University of Muhammadiyah Semarang.

**Results:** there was an effect of community health volunteers' training on improving early TB pulmonary detection skills significantly with a p-value = 0,000 ( $p < 0.05$ ).

**Conclusion:** refreshments of community health volunteers must be planned in the annual work plan program design. Increased skills have a positive impact on the increasing findings of new cases of pulmonary TB. Community health volunteer training can be integrated with the DOTS program in primary health care facilities.

### Keywords:

Community health volunteers; early detection; skills; training; TBC.

## BACKGROUND

Tuberculosis (TB) is an infectious disease and a public health problem globally and nationally. Based on this, the issue of TB was included in the health policy of the Millennium Development Goals (MDGs) in 2015 and continues on the Sustainable Development Goals (SDGs) in 2030. There has been a change in the strategy for handling TB, from *Stop TBC Strategy to End TBC Strategy*. *The End TBC Strategy* is a strategy for handling TB in stages until 2030, which aims to reduce new cases by 80%, deaths due to TB by 90%, and no family affected by TB by 100% (WHO, 2015).

Based on 2018 WHO Global TBC Report, it is estimated that the incidence of TB in Indonesia has reached 842 thousand cases with a mortality rate of 107 thousand cases. Tuberculosis is the top 10 cause of death in the world in 2015 (WHO, Global Tuberculosis Report, 2016). Indonesia is a country with the second highest number of new cases in the world after India. 60% of new cases occurred in 6 countries, namely India, Indonesia, China, Nigeria, Pakistan, and South Africa. Deaths from TB are estimated at 1.4 million deaths plus 0.4 million deaths from TB in people with HIV. Although the number of deaths from TB decreased by 22% between 2000 and 2015 (TB prevention guidelines, 2011).

The number of new TB cases in Central Java Province in 2018 was 143.57 per 100,000 population. This means that the detection of positive BTA TB cases in 2018 has increased compared to 2017, namely 121 per 100,000 population. The CNR for all TB cases in Central Java in 2018 was 143.9 per 100,000 population, this shows that the detection of TB cases in Central Java has increased compared to 2017, namely 132.9 per 100,000 population. The regencies/cities with the highest CNR of all TB cases were Tegal City with 832.5 per 100,000 population, followed by Magelang City (621.1 per 100,000 population), and Pekalongan City (535.3 per 100,000 population). The district/city with the lowest CNR of all TB cases was Temanggung Regency at 45.72 per 100,000 population. Kebumen Regency ranks 15th with CNR TBC BTA positive 149.7 per 100,000 population (Central Java Health Profile, 2018).

Kebumen Regency with a CNR target of 149.7 per 100,000 population reached 145 per 100,000 population, the target Case Detection Rate (CDR) was 2,284 cases and only 1998 cases were achieved. Kutowinangun Primary Health Care with a CNR target of 427 per 100,000 population with a CDR target of 89 cases, only 14 cases were achieved in 2018, this shows the low number of TB case findings in the work area of Kutowinangun Primary Health Care (SITT Data for Kebumen Regency 2019).

Based on the results of preliminary studies, the detection rate for suspicion and the detection rate for TB cases are the benchmarks that determine the success of the TB control program. One of the elements needed in the TB control program is quality human resources. Lack of human resources in primary health care and the dual duties of TB Programmers in the implementation of activities is one of the causes of the low TB case detection rate in the Kutowinangun Community Health Center, therefore empowering Health Cadres is very important in supporting this activity, cadres are elected members of the community, willing, able and have time to find TB suspects (RAD Kebumen Regency, 2017).

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This model for early detection of TB by health cadres is consistent with one of the elements in the *Stop TBC Partnership* to stop TB, namely empowering patients and communities to reduce people's dependence on health workers to solve their health problems. Capturing TB suspects, providing information communication services and TB education also involve the role of health cadres. Efforts to make behavioral changes in individuals, from initially being less or not *aware* of the importance of finding TB cases to becoming *aware*, can use education with the approach *Theory of planned behavior (TPB)*. Based on TPB, TB case finding behavior can be predicted from the desire to detect TB cases. Health education is expected to increase knowledge to form a positive attitude towards TB case finding (Wahyuni, 2012).

Knowledge of health cadres is *determinant* very important as a basis for health cadres in carrying out their activities to combat tuberculosis. This is in line with the theory of *Lawrence Green* which states that the factors that facilitate a person's behavior include knowledge. In general, the goal of health education is to change the behavior of individuals and communities in the health sector through changes or increases in public knowledge (Notoatmodjo, 2007). Based on Ni Luh Putu's research, Eva Yanti (2016) said that training showed a significant change in the difference in the level of knowledge of health cadres on the treatment of TB disease between before and after training. Training and education for health cadres allow early detection of TB by health cadres and this is consistent with one of the elements of WHO's new strategy to stop TB through empowering patients and communities.

Efforts that have been made to increase the role of health cadres in TB case detection include providing information about TB and TB case finding through lectures, discussions, and demonstrations; distributing training modules to cadres, and encouraging health cadres to use them in early detection of tuberculosis, encouraging health cadres to actively seek information about suspects through community meetings; Encourage health cadres to provide health education about TB to the public at every opportunity and discuss the ease and difficulties encountered during the implementation of the role for TB case finding. Another effort under the TPB is to present related parties, in this case, the head of the primary health care and TB program officers during education to form subjective norms that support the implementation of roles in TB case detection and at the same time increase motivation to fulfill the expectations of referents.

## **OBJECTIVE**

This study aims to identify the effect of training of health cadres on early detection skills for pulmonary tuberculosis in a primary health care facility.

## **METHODS**

This study used a *quasi-experimental research design* with the type of *pretest-posttest group design with a control group*. The independent variable is health cadre training and the dependent variable is TB early detection skills. This research was conducted at a government-owned primary health care facility in Kebumen Regency in January 2020. The total sample was 32 people for each intervention and control group using the *total sampling technique*. The inclusion criteria in this study were (1) health cadres in the work area of the Kutowinangun Community Health Center, Kebumen Regency (2) active

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health cadres (3) aged 18-60 years (4) Minimum primary education level (5) able to read, write and communicate in Indonesian. The instrument used was the observation sheet of TB early detection skills developed by researchers based on references.

Researchers provide information about the study and informed consent to health cadres. Researchers measured TB early detection skills before and after training. Health cadres receive TB early detection training modules. The training was carried out in five face-to-face sessions for five days with 60 minutes per session. Researchers were assisted by two enumerators according to predetermined criteria and debriefing before the study. Researchers empower TB patients as targets for early detection of TB simulations. The materials provided consist of basic concepts of TB early detection skills, effective communication, TB early detection practices, and evaluation of activities. Univariate analyzes were presented in terms of frequencies and percentages for data on gender, education level, and training history of health cadres. Data are presented in mean and standard deviation for variables of age, length of time as health cadres, and TB early detection skills. Analysis of bivariate data using paired t-test and independent t-test. This research has passed the ethical test from the Ethics Committee of the Faculty of Public Health, University of Muhammadiyah Semarang

## RESULTS

**Table 1.** Characteristics of health cadres based on sex, education level, and training history (n = 64)

Characteristics	Control		Intervention	
	f	%	f	%
Gender				
Male	1	3	1	3
Female	31	97	31	97
Education Level				
Elementary School	4	13	5	16
Junior High School	8	25	10	31
Senior High School	19	59	14	44
Universities	1	3	3	9
History Training				
Yes	28	88	28	88
No	4	13	4	13

Table 1 explains that almost all of the sexes of health cadres in the intervention and control groups were women, as many as 31 people (97%). Most of the educational backgrounds of health cadres in the intervention and control groups were high school, namely 19 people (59%) in the control group and 14 people (44%) in the intervention group. Based on these data, health cadres, both in the intervention and control groups, are women, their latest education is equivalent to senior high school or equivalent, and has previously attended TB training.

**Table 2.** Characteristics of health cadres based on age and length of service of health cadres (n = 64)

Characteristics	Number	Min	Max	Mean	Median	Std. Deviation	SE
<b>Age</b>							
Control	32	37*	64*	45.28*	45.00*	5.936	1.049
Intervention	32	32*	70*	47.66*	47.50*	8.217	1.453
<b>Work Period</b>							
Control	32	1 **	72 **	15.69 **	9.00 **	13.902	2.457
Intervention	32	1 **	24 **	15.03 **	12.00 **	8.946	1.581

Table 2 illustrates that the mean age of health workers in the intervention group is 47.66 years and the control group is 47.66 years. The average working period of health cadres in the intervention group was 15.03 months and in the control group was 15.69 months. Based on this, health cadres, both the intervention and control groups, are included in the adult age group and have work experience as active health cadres for more than 15 months.

**Table 3.** Description of TB early detection skills for health cadres in the intervention and control groups before and after the intervention

Early detection skills for	intervention			control		
	Mean	SD	95% CI	Mean	SD	95% CI
Before	30.38	6,539	11.50	27.78	6.344	4.00
After	41,88	9,294	2,755	31,78	7,598	1254

Table 3 states that the mean score of TB early detection skills for health cadres before intervention in the intervention group was 30.38 in the intervention group and 27.78 in the control group. The mean score of TB early detection skills for health cadres after the intervention was 41.88 in the intervention group and 31.78 in the control group.

**Table 4.** Differences in TB early detection skills for health cadres in the intervention and control groups before and after the intervention

Group	Mean SD	Mean $\Delta$	<i>p-value of</i>
Intervention			
Before	30.38 6,539	11.50	0.000
After	41.88 9,294		
Control			
Before	27 , 78 6,344	4.00	0.010
After	31,78 7,598		

**Table 5.** Effect of health volunteers training on TB early detection skills

Group	Mean	SD	p-value
Intervention	41,88	9,294	
Control	31,78	7,598	0,000
Difference	10,1	1,698	

Table 4 describes that there is a significant difference in the mean score of skills TB early detection before and after intervention in the intervention group with a value of  $p = 0.000$  ( $p < 0.05$ ) and in the control group with a value of  $p = 0.010$  ( $p < 0.05$ ). The difference in the mean score of TB early detection skills in the intervention group was 11.5 and in the control group was 4. Table 5 explains that there is an effect of health volunteers training on improving TB early detection skills significantly with a value of  $p = 0.000$  ( $p < 0.05$ )

## DISCUSSION

The results showed that the average age of health cadres in the control group was 45.28 years and in the intervention group was 47.66 years. Based on the results of previous research, age differences affect the understanding of individuals in receiving information, conveying information, and facing and solving problems in society. The more mature the individual is, the more prepared he is to face and resolve existing obstacles. This is in line with Siswoyo, Setioputro, and Albarizi (2016), the older a person is, the more logical thinking, emotional and psychological levels are more stable in dealing with problems and accepting something new. This is also in line with other studies where the average age of health cadres is 44.30 years (Enggardini, 2019; Laraeni & Wiratni, 2019; Lestari, Warseno, Trisetyaningsih, Rukmi & Suci, 2019; Anisah, Kusumawati & Kirwono 2017; Vidyastari, Riyanti & Cahyo, 2019; Sukandar & Faiqoh, 2019).

The results showed that most of the health cadres were women. This is in line with research by Anisah and Kusumawati (2017) which state that the sex of health cadres is women (91.3%). Yani, Juniarti, and Lukman's research (2019) also show that of the 48 health cadres who were given TB health education, there were 47 female health cadres. Other research also states that health cadres who are given health education are mostly women because of this (Vidyastari, Riyanti & Cahyo, 2019; Yani, Hidayat & Sari, 2018). This is because based on the demographic data of the population in Kutowinangun District, the majority are female (Puskesmas profile data, 2019).

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The results of the study explained that most of the health cadres had an educational background equivalent to high school. The level of education is very influential in responding to information that comes from outside. The high level of education makes it easier for health cadres to receive information during training.-The level of education is related to the ability to receive health information, both from the mass media and health workers so a health volunteer with higher education is expected to be able to convey health information to the public (Vidyastari, Riyanti & Cahyo, 2019). This is in line with research conducted by Gurning (2016) and Anisah and Kusumawati (2017) that the distribution of health cadres characteristics based on education level is mostly high school graduates or equivalent.

Data was obtained that most of the health cadres had previously attended training on the management of TB patients in the community, but after being evaluated, there was still a need for monitoring and common perception, it was evident that health cadres were not yet capable of screening TB, especially when sending sputum samples to the laboratory. The training that has been carried out in 2019 is in the form of TBC Training of Trainers (TOT). The material provided consists of basic TB knowledge, the role of health cadres, community empowerment, finding people with TB symptoms, and TB counseling. The results of this study are by Yani, Hidayat, and Sari (2019) who said that most of the health cadres had attended the training. There is a need for Re-Training of health cadres so that they can carry out their duties and roles properly to detect early, find suspects correctly, and help accompany the patient's treatment process until he is cured (Widakdo & Supriyatna, 2019). Other studies also say that health cadres have attended previous training (Rahmita & Rachmalia, 2015; Nisa & Dyah, 2017).

The average working period of health cadres is more than 15 months. Health cadres with long tenure will have a better mastery of the material and are more skilled at communicating. This is in line with Rahmita & Rachmalia, 2015; Sukandar, Faiqoh & Effendi, (2019) where the working period of health cadres greatly affects the skills of cadres at work. The longer the health cadres work, the higher the skills they have. This affects better work results (Sondang, 2004 Zainiah, 2015).

The results showed that the average TB early detection skills in the pre-test were 27.78 with a standard deviation of 6.344 and a post-test of 31.78 with a standard deviation of 7.598. Whereas the intervention group had an average pre-test of 30.38 with a standard deviation of 6.539 and a post-test of 41.88 with a standard deviation of 9.294. The results showed that the early detection skills of health cadres before training were still lacking, this was evidenced by the low average pre-test scores in the intervention group and the control group. Cadre's knowledge about health is one important thing because good knowledge will improve the quality of their work. Health cadres who have good knowledge will have higher self-confidence than health cadres with less knowledge.

This is in line with Baswara, and Cintya (2016) that health cadres who have attended previous training tend to have better knowledge than cadres who have never attended the training. Other researchers also mentioned that training was effective in improving the skills of health cadres (Rejeki, Nurlaela & Anandari, 2019; Muhartono, Saftarina & Windarti, 2015; Aderita & Chotimah, 2018). The training carried out is an educational

process that aims to improve special abilities or skills so that it can improve the performance of health cadres in finding TB cases (Vidyastari, Riyanti & Cahyo, 2019).

The results of this study also showed differences in the skills of TB health cadres before and after the intervention as evidenced by the increased ability of cadres in communication, providing information, and early detection skills. The results of research conducted by Sarwani, Rejeki, Nurlaela, and Andarini (2019) said that training can improve the knowledge and skills of health cadres. Increasing cadre skills in communicating, information and education will further improve the performance of health cadres in screening suspected TB cases in their respective areas (Herwinda, et al., 2020).

There is an effect of training of health cadres on TB early detection skills. The results of TB early detection training activities for health cadres at the Kutowinangun Primary Health Care, Kebumen Regency showed the level of success with indicators of a positive response from health cadres in the form of increased knowledge before and after training. The skills of health cadres in communicating are increasing increased and more focused during demonstrations and direct practice with the suspect. This is in line with research conducted by Sinaga, Widawati, Hotmaida, Fuadah, Maryani, and Yogisutanti (2020) that the skills of cadres in early detection of pulmonary tuberculosis before training and after training have increased significantly, with a mean score of knowledge before training is 8.63. (53.94%) and after training, it increased to 10.11 (63.19%).

Health cadres' skills improve after training. This is evidenced by the increasing number of suspects sent with positive TB results through the Monocular Rapid Test (TCM) examination. Knowledge of health cadres can be increased with the training. Through education Additionally, health cadres have broader insights related to their duties and roles. Health cadres who have received additional education will have higher knowledge. On the other hand, health cadres are not or have never been got additional education, and will have limited insight so limited capacity in performing their roles and duties. This is in line with Yanti (2017) who explains that there is an increase in the knowledge, skills, and attitudes of health cadres after training. Research conducted by Aderita and Chotimah (2018) said that there was a significant difference between the knowledge scores of health cadres before and after participating in training. Other researchers also mentioned that effective training improves skills (Rejeki, Nurlaela & Anandari, 2019; Muhartono, Saftarina & Windarti, 2015; Malihatun, 2017; Pratiwi, pramono & junaedi, 2017). Knowledge of TB is related to the practice of finding TB suspect cases. In other words, cadres who have good knowledge of TB influence the behavior of cadres in finding TB suspects (Nisa & Santik 2017).

The community as the subject in solving health problems in the region needs to be empowered so that it can create community independence. Community health nurses work closely with health cadres to solve public health problems through the use of available resources. Active participation from the community will increase the community's ability to achieve optimal public health status. There needs to be a network with related parties in solving health problems, especially tuberculosis. Health cadres as an extension of health workers must be able to play a role in finding new cases and

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assisting patients during treatment. Nurses act as educators, namely providing education or training for health cadres so that the capacity in finding TB cases and handling patients in the community increases. Nurses as collaborators, namely nurses work together with health cadres and related parties in breaking the chain of spreading TB disease in the community.

## CONCLUSION

There is a significant effect of training health cadres on improving TB early detection skills. Health cadres as the extension of health workers in breaking the chain of TB disease transmission in the community need to be equipped with sufficient knowledge and skills so that they can carry out their roles and duties. It is necessary to monitor and evaluate the performance of health cadres in finding new cases and assisting patients during treatment. Training for health cadres should be carried out regularly and integrated with the DOTS program in health care facilities. Various forms of supporting media in the training process can be developed based on needs such as modules, manuals, guidelines, and so on. The results of this study can be used as a basis for developing or modifying the form of training for health cadres as needed. Researchers can then identify the effect of health cadre training on other variables such as the skills of recording and reporting TB cases, mentoring patients during treatment, managing drug side effects, distributing samples for laboratory examinations, and so on.

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