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EFFECTIVENESS OF SOCIO-CULTURE BASED COMMUNITY INVOLVEMENT STRATEGY IN IMPROVING KNOWLEDGE, ATTITUDE, AND PRACTICES REGARDING TUBERCULOSIS AMONG PEOPLES IN TAPANULI SELATAN, INDONESIA

Ismail Fahmi[1], Badaruddin[2], R. Kintoko Rochadi[2], Rahayu Lubis[2]

[1]Ph.D Student in Public Health Sciences, Universitas Sumatera Utara (USU), Medan, Indonesia
[2]Lecturer in Universitas Sumatera Utara (USU), Medan, Indonesia

ABSTRACT: *Tuberculosis is a disease of major public health concern in Indonesia where there is a significant increase in mortality. This disease is also one of the main causes of death. The increasing incidence of TB and the low number of treatments is a big threat to TB control and poses a great risk to increased transmission to the general public and an increase in multi-drug resistant TB. Previous studies have reported that knowledge, attitudes and practices regarding TB among the community are bad and are considered a serious challenge for TB control programs. This study evaluates the effectiveness of the health intervention program developed in increasing knowledge, attitudes and practices among the people of South Tapanuli who still uphold customary values.*

KEYWORDS: *Tuberculosis; community empowerment; social-culture; knowledge-attitude action; South Tapanuli.*

INTRODUCTION

Tuberculosis (TB) is one of the leading causes of death in Indonesia. The Global TB Report 2018 places Indonesia as one of the countries with a high Tuberculosis burden where there are an estimated 842,000 cases with a mortality of 107 thousand cases (WHO, 2018). Although the Directly Observed Therapy Short course (DOTS) strategy has been introduced since 1995, the number of cases reported and the success rate of treatment in Indonesia is still low. The TB case notification rate is 131 and 161 per 100,000 population and the success rate of TB case treatment is 89.5% and 85.1% respectively in 2008 and 2017 (Ministry of Health of the Republic of Indonesia, 2018).

The increasing incidence of TB and the low number of treatments is a big threat to TB control and poses a great risk to increased transmission to the general public and an increase in multi-drug resistant TB. With the discovery of 3,276 cases in 2016 (South Tapanuli District Health Office, 2017), South Tapanuli Regency still faces ongoing threats until the TB epidemic can be controlled. Treatment success rates of 83% in 2015 percent and 91% in 2016 (South Tapanuli Regency District Health Office, 2017) indicate that the prevention of pulmonary TB in this district did not reach a significant target.

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Countermeasures made by the government are often hampered by several factors such as perception of TB, socio-cultural community, and family support (Saifullah et al., 2018). These factors were also found to be obstacles to the TB control program in South Tapanuli Regency. The perception that TB is a disease of witchcraft, poisons, witchcraft, curses, and even hereditary diseases results in people who are ill not immediately taken for treatment to health workers, but only given traditional medicines such as water that has been charmed by a shaman, eat betel, and consume the leaves or flowers that are considered medicinal. This condition results in inadequate treatment which will ultimately affect public health status. In addition, among the people of South Tapanuli who uphold customs in high socio-culture, knowledge of the impact of incomplete treatment, behavior that does not support treatment programs, and the lack of active community involvement in TB control programs makes it difficult to break off TB transmission chain in South Tapanuli Regency (Fahmi, 2007).

Previous studies have reported that knowledge, attitudes, and actions (KAP) regarding TB among Indonesian people are bad and are considered a serious challenge for TB control programs because they cause high transmission and delays in health seeking behavior (Simak et al., 2013; Rizana et al., 2016, Rahman et al., 2017). Ideally the community must have good knowledge, the right attitude, and the right actions about TB to prevent infection and spread of this disease. Thus, assessment of knowledge, attitudes, and practices among the community towards this disease is very important to identify problems, planning, and implementation of intervention programs with socio-cultural based community empowerment strategies.

There is a lack of research to determine TB prevention knowledge and practices among communities in South Tapanuli District. Studies conducted on knowledge, attitudes and practices regarding TB among the community are primarily descriptive, and studies on the effect of intervention programs with socio-cultural based community empowerment strategies are still scarce. There is no structured intervention program on behavior modification directed and specific to the community regarding TB in Indonesia. Evaluation of the Advocacy, Communication and Social Mobilization (ACSM) strategy which is a component of the TB control program in 2016 has largely proved ineffective (Moulina, 2016). In addition, if an innovative health intervention program is not carried out, TB infection will continue to grow and increase patient mortality. This study aims to evaluate the effectiveness of new health education intervention programs in increasing knowledge, attitudes, and practices regarding TB among communities in South Tapanuli District, North Sumatra Province, Indonesia based on theories about health care, community empowerment, health promotion, and planning and implementation of health promotion programs.

RESEARCH METHOD

Research design

This research is a quasi-experimental research with a pretest and posttest with control group design. Data related to socio-demographic characteristics and health behaviors of respondents were collected before and after the intervention was given. Individual health behavior in terms of aspects of knowledge, attitudes, and actions related to TB disease (Ross & Smith, 1969).

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Instrument
The questionnaire was developed with reference to some research literature and instrument development guidelines such as "A guide to developing KAP surveys" by WHO (2008), "National Strategy for TB Control in Indonesia 2010-2014" by the Indonesian Ministry of Health (2011), "National Action Plan Collaboration on TB-HIV 2015-219 "by the Indonesian Ministry of Health (2015), and the" Tuberculosis Control Program Policy "by the Indonesian Ministry of Health (2017). Measurements were taken four times through the first test (pre-intervention, before the intervention program was carried out), the second test (1 month after the intervention), the third test (3 months after the intervention), and the fourth test (6 months after the intervention). Respondents who could not read or write were helped by reading statements in the local language of South Tapanuli.

Referring to the opinion of Hair (2006), questionnaire reliability testing was conducted on 150 respondents aged 17 to 75 years who were randomly selected from 12 sub-districts in South Tapanuli Regency, namely Sayur Matinggi, Tantom Angkola, East Angkola, South Angkola, Angkola Sangkunur, Batang Toru , Marancar, Muara Batang Toru, Sipirok, Ass, Saipar Dolok Hole, and Aek Bilah. Respondents testing the questionnaire were distributed randomly in the 12 districts. Internal reliability is calculated using Cronbach's Alpha with item criteria said to have a strong reliability score if the item has a coefficient α of not less than 0.3 (Gliem & Gliem, 2003). The results of the reliability test conducted showed a strong reliability score for knowledge (0.874), attitude (0.882), and action (0.837).

Data collection
Data collection followed the procedure of conducting home visits as regulated in minister of health regulation No 39 of 2016 concerning Guidelines for Conducting a Healthy Indonesia Program with a Family Approach and was carried out starting in July 2017 and ending in August 2018 in two sub-districts in South Tapanuli Regency.

Sample
The determination of the sample uses a multi-stage random sampling technique in which respondents are distributed randomly and / or proportionally in the five study villages. In each village, respondents were distributed randomly in several villages. In each village randomly selected family heads or family members aged 15 to 75 years. From each family head or selected family member, using the Kish method (Kish, 1949) one male / female person was chosen as the respondent**.**

Batang Angkola District was randomly assigned as the Intervention group and West Angkola as the Control group. Of the target population of the intervention program, amounting to 2,965 people aged 15 to 75 years and residing in the villages of Pasar Lama, Benteng Huraba, Janji Manaon, and Sitampa in Batang Angkola District, a sample of 352 people was determined. Meanwhile, the sample of the control group was 321 people randomly selected from 1,637 people from Parsangkan village aged 15 to 75 years as the control population. Data was collected by four trained surveyors under the coordination of researchers. The data collected in this study has gone through quality

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control and validity checks where the validity of the data was examined through re-interviews with 5% of the total sample of 673 people (352 people at the intervention site and 321 people at the control location), namely 34 respondents selected by random. In the quality control process, no significant errors were found.

Data analysis

Data analysis through non-parametric statistics was performed using SPSS Statistical software version 22. The χ^2 test was used to compare socio-demographic variables within each group (intervention and control). The Wilcoxon Signed-Rank Test was used to compare pre-intervention data, 1 month, 3 months, and 6 months after the intervention in each group. The Mann-Whitney's U test was used for comparison between groups. Data analysis used a statistical significance level of 0.05.

Ethical issues

Before collecting data the researchers submitted a letter to the research ethics committee of the University of North Sumatra. After going through several improvements and refinements to the questionnaire, the Ethics Committee team stated that the research carried out had met the ethical norms so that it was feasible to proceed.

RESULT AND DISCUSSION

Socio-demographic characteristics

Data on the socio-demographic characteristics of the respondents of the two groups (intervention and control) are presented in Table 1. To ensure that the bias in estimating the effect of the intervention on the results of the incomparability between the intervention group and the group without intervention, a homogeneity test of the two groups was carried out. The χ^2 test results indicate that there were no significant differences between the two groups based on the socio-demographic characteristics of the respondents in the intervention and control groups at the start of the study. In other words, the two groups are comparable before intervention.

Table 1. Respondent socio-demographic characteristics

Characteristics	Total N = 673	Intervention n = 352	Control n = 321	*p*-value
Age				
Average ± SD	36,93 ± 8,69	37,57 ± 8,55	36,23 ± 8,82	0,948
Gender				
Male	307 (45,6%)	158 (44,9%)	149 (46,4%)	0,690
Female	366 (54,4%)	194 (55,1%)	172 (53,6%)	
Education				
No school	142 (21,1%)	45 (21,3%)	67 (20,9%)	
Primary School	147 (21,8%)	78 (22,2%)	69 (21,5%)	0,993
Junior High School	141 (21,0%)	74 (21,0%)	67 (20,9%)	

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Senior High School	127 (18,9%)	64 (18,2%)	63 (19,6%)	
Collage	116 (17,2%)	61 (17,3%)	55 (17,1%)	
Religion				
Islam	473 (70,3%)	258 (73,3%)	215 (67,0%)	0,199
Catholic	82 (12,2%)	39 (11,1%)	43 (13,4%)	
Protestant	118 (17,5%)	55 (15,6%)	63 (19,6%)	
occupation				
Farmers / Laborers	206 (30,6%)	108 (30,7%)	98 (30,5%)	
entrepreneur	227 (33,7%)	116 (33,0%)	111 (34,6%)	
Public / Private Servants	168 (25,0%)	89 (25,3%)	79 (24,6%)	0,990
TNI/POLRI	51 (7,6%)	28 (8,0%)	23 (7,2%)	
Others	21 (3,1%)	11 (3,1%)	10 (3,1%)	
Income				
More than Rp. 2 million	229 (34,0%)	122 (34,7%)	107 (33,3%)	
Rp1 million to Rp2 million	224 (33,3%)	120 (34,1%)	104 (32,4%)	0,705
Less than Rp1 million	220 (32,7%)	110 (31,3%)	110 (34,3%)	
Residence				
City	351 (52,2%)	187 (53,1%)	164 (51,1%)	0,598
Village	322 (47,8%)	165 (46,9%)	157 (48,9%)	

The χ^2 test - Chi-square is significant at p> 0.05; SD - Standard deviation.

TB knowledge

Wilcoxon Signed-Rank test results in the intervention group for comparison of the mean and standard deviation of the pre-intervention knowledge score (7.52 ± 2.02), one month after the intervention (7.86 ± 1.99), three months after the intervention (8.21 ± 2.04), and six months after the intervention (8.35 ± 1.98), showed a statistically significant improvement (p <0.05). In the control group, the mean and standard deviation of the initial knowledge score (7.40 ± 2.11), the first month (7.52 ± 1.87), and the third month (7.74 ± 1.94) showed a significant increase. statistically significant (p <0.05), while at the sixth month (7.82 ± 1.94) there was no increase (p = 0.054). Table 2 shows the comparison of the mean and standard deviation of each group's knowledge score.

Table 2. Comparison of knowledge scores for each group

Time	Intervention (Average ± SD)	*Z*	*p-value*	Control *(Average ± SD)*	*Z*	*p-value*
Pre-intervention	7,52 ± 2,02			7,40 ± 2,11		
1 month	7,86 ± 1,99	-5,32	0,000	7,52 ± 1,87	-2,71	0,007
3 months	8,21 ± 2,04	-7,13	0,000	7,74 ± 1,94	-3,96	0,000
6 months	8,35 ± 1,98	-3,85	0,000	7,82 ± 1,94	-1,92	0,054

The Wilcoxon Signed-Rank Test was significant at p <0.05; SD - Standard deviation.

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Before the intervention, the Mann-Whitney's U test results showed no significant difference (U = 52573.5, p = 0.116) in the mean rank of the knowledge score between the intervention group (348.14) and the control group (324 , 78). After six months of intervention, the mean score of the intervention group's knowledge score (355.68) was significantly higher (U = 49919.5, p = 0.006) compared to the average score of the control group's knowledge score (316.51). Table 4 shows the effect of the intervention on the average score of knowledge about TB.

Attitude to TB

Comparison of mean and standard deviation of pre-intervention attitude scores (28.82 ± 4.83), one month after the intervention (29.99 ± 5.30), three months after the intervention (31.28 ± 5.82), and six months after the intervention (32.01 ± 5.70), showed a statistically significant improvement (p <0.05). In the control group, the mean and standard deviation of the initial knowledge score (28.80 ± 5.20) and the first month (29.05 ± 5.44) did not increase (p = 0.054), while the third month (29.33 ± 5.51) and the sixth month (29.97 ± 5.51) showed a statistically significant increase (p <0.05). Table 3 shows the comparison of the mean and standard deviation of the knowledge scores of each group.

Table 3. Comparison of attitude scores of each group

Time	Intervention (Average ± SD)	*Z*	*p-value*	Control *(Average ± SD)*	*Z*	*p-value*
Pre-intervention	28,82 ± 4,83			28,80 ± 5,20		
1 month	29,99 ± 5,30	-5,55	0,000	29,05 ± 5,44	-0,64	0,521
3 month	31,28 ± 5,82	-8,39	0,000	29,33 ± 5,51	-2,16	0,031
6 month	32,01 ± 5,70	-5,41	0,000	29,97 ± 5,51	-0,03	0,001

The Wilcoxon Signed-Rank Test was significant at p <0.05; SD - Standard deviation.

There was no significant difference (U = 55899, p = 0.812) in the average ranking of attitude scores between the intervention group (338.70) and the control group (335.14) before the intervention. After six months of intervention, the intervention group's average attitude score score (395.78) was significantly higher (U = 35805.5, p <0.05) compared to the control group's average attitude score score (272.54) . Table 4 shows the effect of the intervention on the average attitude score on TB.

Actions related to TB

Comparison of mean and standard deviation of pre-intervention measures (5.42 ± 1.47), one month after the intervention (5.90 ± 1.62), three months after the intervention (6.34 ± 1.65), and six months after the intervention (6.60 ± 1.70), showed a statistically significant improvement (p <0.05). In the control group, the mean and standard deviation of the initial knowledge score (5.40 ± 1.51) and the first month (5.66 ± 1.74) showed a statistically significant increase (p = 0.001), while at the time of the month third (5.77 ± 1.73) did not increase (p = 0.160), but during the sixth month (5.93 ± 1.65) there was a statistically significant increase (p = 0.048). Table 4 shows the comparison of the mean and standard deviation of each group's knowledge score.

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Table 4. Comparison of each group's action scores

Time	Intervention (Average ± SD)	*Z*	*p-value*	Control *(Average ± SD)*	*Z*	*p-value*
Pre-intervention	5,42 ± 1,47			5,40 ± 1,51		
1 Month	5,90 ± 1,62	-8,97	0,000	(5,66 ± 1,74	-3,18	0,001
3 Month	6,34 ± 1,65	-8,11	0,000	5,77 ± 1,73	-1,41	0,160
6 Month	6,60 ± 1,70	-5,57	0,000	5,93 ± 1,65	-1,98	0,048

The Wilcoxon Signed-Rank Test was significant at $p < 0.05$; SD - Standard deviation.

Before the intervention, there was no significant difference ($U = 55294$, $p = 0.625$) in the average ranking of knowledge scores between the intervention group (340.41) and the control group (333.26). After six months of intervention, the average rating of the intervention group's action scores (405.25) was significantly higher ($U = 3247$, $p < 0.05$) compared to the average rating of the control group's actions (262.16). Table 5 shows the effect of the intervention on the average score of knowledge about TB.

Table 5. Effect of interventions on average TB knowledge, attitude and action score.

Health Behavior	Time	Intervention (mean rank)	Control (mean rank)	Mann-Whitney U	p-value
Knowledge	Pre-intervention	348,14	324,78	52573,5	0,116
	9 months	335,68	316,51	49919,5	0,006
Attitude	Pre-intervention	338,70	335,14	55899,0	0,812
	9 months	395,78	272,54	35805,5	0,000
Action	Pre-intervention	340,41	333,26	55294,0	0,625
	9 months	405,25	262,16	32472,0	0,000

The Mann Whitney's U test was significant at $p < 0.05$.

DISCUSSION

This study uses an intervention program with a socio-cultural based community empowerment strategy to increase knowledge, attitudes and practices regarding TB among the community in the intervention group. The results of the χ^2 test showed that there were no significant differences between the two groups based on socio-demographic characteristics at the beginning of the study.

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In other words, age, sex, education, religion, occupation, income, and the area of residence of the respondents in the two groups were comparable at the time before the intervention was carried out. The results of the data analysis showed that the socio-cultural-based public health intervention program was effective in increasing the knowledge, attitudes and actions of the people of South Tapanuli Regency regarding TB in the intervention group compared to the control group.

The results of this study provide evidence that a significant increase in knowledge, attitudes, and practices regarding TB among the community can be achieved through a structured intervention program. The changes observed in the results can be attributed to the influence of the interventions delivered. However, research evaluating the impact of intervention programs with socio-cultural based community empowerment strategies on knowledge, attitudes and practices regarding TB among communities is still scarce. Therefore this study is limited in comparing the size of its intervention effect with other studies. Further research is needed to evaluate the impact of intervention programs with community-based socio-cultural-based community empowerment strategies, especially in countries with high prevalence rates as TB burden increases among sufferers.

This study is in accordance with research reports conducted in Somalia among the general public which showed a significant increase in knowledge about tuberculosis (Tolossa et al., 2014). In general, people in the city of Shinile have a basic awareness about TB. However, they have little information about the causes of TB, so most respondents support self-treatment options as an effective treatment method for this disease. Therefore, interventions through health education are advised to bring significant changes in their knowledge specifically about the causes of TB, the means of transmission, prevention, and treatment. The intervention program in this study which had an effect on increasing respondents' attitudes and actions towards TB is similar to the intervention report among rural Ethiopian communities (Bati et al., 2013) which concluded that the low level of attitude and knowledge about TB was associated with female respondents. Therefore, the TB control strategy must include a component of increasing public awareness. Further research is needed to determine the effect of sex and age on health intervention programs on knowledge, attitudes and practices regarding TB among the general public.

Conclusion

This study shows that the health intervention program with a social culture-based community empowerment strategy is effective in increasing knowledge, attitudes, and practices regarding TB among the South Tapanuli community. The program developed is recommended to be included as a strategy in the national TB control guidelines.

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