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Empowerment Tuberculosis Cadres with Participatory Socialization as Effort to Improve The TB Suspect's Achievements at The Sempu's Public Health Center

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ABSTRACT

Background: Tuberculosis (TB) is an infectious disease with high mortality and morbidity rates in Indonesia, caused by the bacterium Mycobacterium tuberculosis. The Case Detection Rate (CDR) in Banyuwangi is still relatively low at 54% compared to the set target. In Banyuwangi, one of the Non-Governmental Organizations (NGOs), Yayasan Bhanu Yasa Sejahtera Yabhysa, supports the TB control program in the region. Since 2021, this community has collaborated with the Banyuwangi Health Department to implement community-based TB interventions in 28 Community Health Centers (*Puskesmas*) spread across 16 districts, with a total of 66 active TB cadres. This community service aims to train Tuberculosis (TB) cadres through socialization to improve the performance of TB suspects in Sempu Banyuwangi Community Health Center.
Methods: The analysis of knowledge improvement data used a paired T-test with a 95% Confidence Interval. The test evaluated the difference in knowledge improvement before and after education.
Results: From the results of this community service, there was an increase in knowledge before and after socialization by 0.06 or 6%. The formation of TB cadres through contact investigation simulation carried out in community service activities resulted in the formation of four cadres.
Conclusion: Based on the pre-test and post-test results, respondents showed a 6% increase in knowledge. This community service hopes to improve the achievement of TB suspect cases and reduce TB cases in Sempu Community Health Center.

Keywords: Tuberculosis; suspect; contact investigation.
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INTRODUCTION

Tuberculosis (TB) is an infectious disease with high mortality and morbidity rates in Indonesia, caused by the bacterium Mycobacterium tuberculosis. TB currently ranks as the 13th leading cause of death worldwide and the second leading infectious cause after COVID-19, surpassing even HIV/AIDS. According to the Directorate General of Disease Control and Health Improvement in 2017, TB remains a global public health challenge. In 2020, 1.5 million people died from TB, including 214,000 individuals with HIV. In 2020, there were approximately 10 million TB cases worldwide, consisting of 5.6 million males, 3.3 million females, and 1.1 million children. Furthermore, 30 countries bear a high burden of TB, contributing to around 86% of new TB cases. This is partly due to drug-resistant TB (DR-TB), which continues to be a public health crisis and a threat to health security.[1] TB can infect individuals of all ages, from infants to the elderly, and can affect various organs, including the brain, kidneys, and spine.[2]

TB transmission occurs through two main methods: primary and secondary spread.[3] Primary TB spread occurs through airborne transmission via droplet nuclei in the surrounding environment. These particles can remain suspended in the air for approximately 1-2 hours, depending on humidity, ventilation, and exposure to ultraviolet light. The bacteria can survive in dark and humid conditions for days to months. If a healthy person inhales these droplets, the particles can attach to the lungs or respiratory tissues, initiating the TB incubation period.[4]

In Indonesia, there are approximately 969,000 TB cases, 28,000 drug-resistant TB cases, and 144,000 TB-related deaths, with a treatment success rate of 86%.[5] These statistics indicate that TB remains a significant public health issue in Indonesia. Low awareness of TB and the lack of TB cadre training contribute to this problem. A study by Nababan et al. found that implementing the TB program in the Matiti Primary Health Center in Doloksanggul District has not been fully realized.[6] Additionally, according to Indah Prabawati, although the policies are correct, issues related to patients discontinuing treatment unilaterally due to fear of COVID-19 are still not optimally addressed in the Bangsal Primary Health

Center, Mojokerto District.[7] In this context, the role of TB cadres in optimizing the detection of TB suspects needs to be emphasized, as they can provide education and direct support to TB patients and their families.

Case Detection Rate (CDR) is an indicator that reflects the coverage of new positive Acid-Fast Bacilli (AFB) patients.[8] The Case Detection Rate (CDR) in Banyuwangi is still relatively low at 54% compared to the set target. In 2020, the highest number of TB cases were found in Banyuwangi District (193 cases), followed by Muncar District (183 cases), Wongsorejo District (126 cases), and Genteng District (124 cases). CDR can increase when the suspect achievement is high (70%), so the low suspect achievement in Banyuwangi Health Centers and CDR below 70% are significant issues that need immediate attention. Statistically, there is a significant positive correlation between the number of TB cases in 2020 and the population per district in Banyuwangi.

In Banyuwangi, one of the Non-Governmental Organizations (NGOs), Yayasan Bhanu Yasa Sejahtera Yabhysa, supports the TB control program in the region. Since 2021, this community has collaborated with the Banyuwangi Health Department to implement community-based TB interventions in 28 Community Health Centers (Puskesmas) spread across 16 districts, with a total of 66 active TB cadres. In 2021, these cadres referred 707 TB suspects to the Community Health Centers, and 276 of them were diagnosed with TB. However, despite these efforts, the achievements are believed to be still low, and the Case Detection Rate (CDR) is far from the target of 70%. Some efforts made by the Health Centers to achieve the CDR target include actively screening active TB cases in every suspect and conducting socialization to increase public knowledge about TB.

Based on these figures, there is a need for a review and capacity-building to achieve the CDR target, one of which is the formation and improvement of cadres. According to a study conducted by Amirah et al., 2022, cadres at Panombeian Community Health Center fulfilled their responsibilities as community representatives by actively conducting socialization and health research if there were people with TB symptoms.[9] A similar training was conducted for YABHISA Sumenep cadres on Cadre Refreshment, and it was found that overall, 45 cadres experienced an increase in knowledge. This was considered effective in the strategy to improve CDR achievement. Therefore, the community service project in collaboration with Yayasan Bhanu Yasa Sejahtera (YABHISA) Banyuwangi aims to form TB cadres, provide interactive education, including information related to TB, contact investigation simulations, and cadre training to improve cadre knowledge and enhance TB suspect achievements in the working area of Sempu Banyuwangi Community Health Center through the formation of these cadres.

METHOD

This study is a quasi-experimental research involving intervention on the research subjects. The research is a community service activity conducted at the Sempu Community Health Center on July 10 and 11, 2023. The participants in this activity were 22 cadres. The series of activities includes providing information using interactive education through socialization, simulation, and cadre formation. The socialization series includes educational methods such as lectures, discussions, and contact investigation simulations. The lecture method involves the delivery of five modules over two days. On the first day, three modules were discussed, including:

1. The first module covered the TB situation and TB control policies in Banyuwangi Regency, contact investigation for household and non-household contacts, sputum specimen collection, packaging and shipping, TB in children, and immunization.
2. The second module discussed effective communication strategies in TB control.
3. The third module covered the causes of TB, risk factors, TB, drug-susceptible TB (DS-TB), drug-resistant TB (DR-TB), treatment duration, treatment adherence, and basic information about DS-TB and DR-TB.

On the second day, two modules were presented:

4. The first module focused on the "YABHISA" TB care program, clinical symptoms of TB, and active case finding.
5. The second module discussed the role of TB cadres, the knowledge needed for TB cadres, and the skills required for TB cadres.

After the presentation, discussions and questions related to the five modules were conducted. The advanced level of socialization involved contact investigation simulations for household and non-household contacts. At the end of the second day, participants conducted contact investigation simulations based on their roles as TB cadres.

At the end of the community service activity, a selection and formation process for Tuberculosis (TB) cadres was conducted to assist the Sempu Community Health Center in achieving the target of TB suspect detection. The level of knowledge was evaluated using pre-test and post-test with a questionnaire consisting of 50 questions. Subsequently, an average assessment was performed with each question scored 2 points for a correct answer and 0 points for an incorrect answer, with knowledge categories set at (76%-100%) for high, (56%-75%) for moderate, and (<55%) for low involved in the community service activity.

The development of pre-test and post-test instruments and ethical approval procedures was carried out following the guidelines set by the Human Research Ethics Clearance Committee (HRECC). An ethics approval certificate with the number 764/HRECC.FODM/VII/2023 was obtained. The analysis of knowledge improvement data utilized a paired-sample T-test with a 95% Confidence Interval. The test was conducted to evaluate the difference in knowledge improvement before and after socialization.

RESULT

Distribution of Respondent Characteristics

Information regarding respondent characteristics indicates that the respondents are 22 cadres of health

Table 1. Distribution of Respondents by Gender

Gender	Percentage (%)
Male	4,55
Female	95,45
Total	**100**

Table 2. Frequency Distribution of Knowledge Before Socialization

Category	Frequency	Percentage
Low	1	4.5
Moderate	19	86.4
High	2	9.1
Total	**22**	**100**

Table 3. Frequency Distribution of Knowledge After Socialization

Category	Frequency	Percentage
Low	1	4.5
Moderate	13	59.1
High	8	36.4
Total	**22**	**100**

Table 4. Analysis of the Difference in Knowledge Before and After Socialization

	N	Mean ± SD	Between Mean ± SD	95% confident interval	P-value
Pretest	22	65.45 ± 7.20	4.27 ± 8.58	8.07-0.46	0.03
Postest	22	1.73 ± 9.62			

Figure 1. *Presentation of materials by the speaker.*

workers from Sempu Community Health Center. The distribution of respondents reveals a higher proportion of females (95.45%) compared to males (4.55%).

The distribution of female respondents is higher than male respondents because the health cadres participating in community service include cadres from various health backgrounds, such as *posyandu* cadres, PKK (Family Welfare Movement) mothers, and others.

Improvement in Knowledge Before and After Socialization

The community service program on Tuberculosis (TBC) assesses participants' knowledge levels using pre-test and post-test methods. Both the pre-test and post-test consist of 50 questions. The participants' assessments are then averaged to obtain a maximum score of 100. The knowledge scores are categorized as follows: good (76%-100%), moderate (56%-75%), and low (<55%).

This categorization of knowledge is employed to evaluate the participants' knowledge before and after the community service program. It provides valuable insights into the extent of knowledge improvement achieved through the community service program.

From Table 2 above, the frequency distribution of knowledge before socialization among Sempu Community Health Center cadres is categorized as low, moderate, and high. In the low knowledge category, there is 1 respondent, accounting for 4.5%; in the moderate knowledge category, there are 19 respondents, representing 86.4%; and in the high knowledge category, there are 2 respondents, constituting 9.1%.

From Table 3 above, the frequency distribution of knowledge after socialization among Sempu Community Health Center cadres is categorized as low, moderate, and high. In the low knowledge category, there is 1 respondent, accounting for 4.5%; in the moderate knowledge category, there are 13 respondents, representing 59.1%; and in the high knowledge category, there are 8 respondents, constituting 36.4%.

Based on the paired t-test, the results indicate a significant difference between respondents' knowledge before and after socialization ($p = 0.03$; 95% CI = 8.07 - 0.46, SD = 8.58). This implies a positive difference direction with a mean of 4.27, experiencing a knowledge increase of 0.06 or 6% from the value before receiving socialization. The significance of 0.03 suggests a significant difference between before and after education.

Formation of Tuberculosis (TBC) Cadres at Sempu Community Health Center

After the socialization, the next stage is the formation of Tuberculosis (TBC) cadres at Sempu Community Health Center. As a result of the community service, there has been an addition of four TBC cadres in the Sempu Community Health Center area.

Figure 2. *Contact Investigation Simulation. (a) Contact Investigation Simulation. (b)*

DISCUSSION

Improvement in Knowledge Before and After Socialization

The main factors in controlling tuberculosis are the level of knowledge and how to prevent the transmission of tuberculosis.[10] The results indicate a difference in respondents' knowledge before and after socialization. This can be interpreted as a positive difference with a mean of 4.27 and an increase in knowledge of 0.06 or 6% from the value before receiving socialization. Based on a study by Ernawati et al., 2021, there was an increase in the average knowledge in pre-test and post-test, with an 83.5% increase in knowledge about TB, an 82% increase in knowledge about the duties of TB cadres, and an 80% increase in knowledge about the management of TB[11]. Another study by Artama (2023) showed increased community knowledge obtained from pre-test and post-test results, with an average score increasing from 39.10 to 93.52. This was achieved through promotional and preventive actions and teaching practices for handling and preventing the spread of TB[12]. Thus, it can be concluded that the socialization provided to the respondents can improve knowledge about tuberculosis. Research conducted by Jatmiko et al., (2018) proves that socialization through lecture methods is the most effective approach in enhancing public knowledge about tuberculosis[13].

Formation of TB Cadres at Sempu Community Health Center

From the community service conducted, four cadres were added to assist in identifying TB case suspects at Sempu Community Health Center. Monitoring by the TB Program coordinator at Sempu Community Health Center found positive TB cases in the field in August (2 cases), October (8 cases), and November (4 cases). Suspected case findings reached the health center's target, with 77 suspects in August, 28 in September, 38 in October, and 35 in November. Forming cadres is crucial to supporting Sempu Community Health Center in achieving the target identification of TB case suspects. This community service project resulted in the formation of four TB cadres who will receive direct guidance from the TB program coordinator at Sempu Community Health Center and TB cadres from YABHISA Banyuwangi.

The process of forming TB cadres includes contact investigation simulations conducted during community service activities. YABHISA Banyuwangi guides the simulations. Participants are divided into groups playing roles such as patients, patient families, neighbors, TB cadres, and the TB program coordinator at Sempu Community Health Center. In these simulations, participants learn how to conduct contact investigations so that the selected TB cadres understand the process and help achieve the target identification of TB case suspects in the Sempu Community Health Center area. According to a study by Trisno (2023), Cadre Refreshment training with the concept of socialization, simulation, practice, and evaluation effectively improves cadres' knowledge and performance achievements in identifying TB cases[14]. Other studies indicate that there are differences in knowledge and attitudes after receiving training with the role-play method.

This research has the advantage that activities are not only focused on socialization, but apply contact investigation simulations and the formation of TB cadres. The formation of cadres will be guided directly by YABHISA Banyuwangi. The weakness of this research is the lack of interest of respondents to become TB cadres. However, this is not an obstacle for the Sempu Health Center to continue to achieve the target of finding TB suspects.

CONCLUSION

Based on the results of the community service conducted at the Sempu Health Center related to efforts to increase knowledge about Tuberculosis (TB) and the formation of TB cadres, several conclusions can be drawn:

1. **Knowledge Improvement:** The TB awareness campaign increased respondents' knowledge. There was a significant difference in knowledge before and after the campaign, with an increase of 6%. This is consistent with previous research findings that show increased public knowledge after receiving education about TB.
2. **Formation of TB Cadres:** Four TB cadres were successfully formed at the Sempu Health Center through community service. These cadres are expected to assist in searching for TB case suspects and improve early detection of the disease in the area. The cadre formation process involved contact investigation simulations, which have proven effective in enhancing the cadres' knowledge and skills.
3. **Positive Impact on TB Suspect Case Identification:** After the formation of cadres, the Sempu Health Center identified more TB suspect cases. The discovery of positive TB cases indicates the effectiveness of the measures taken to address this disease at the community level.

Thus, this community service program has positively contributed to increasing public knowledge about TB, forming cadres that can support early detection efforts, and improving the achievement of identifying TB suspect cases at the Sempu Health Center. Similar programs can be adopted in other locations to strengthen TB prevention and control efforts.

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CONFLICT OF INTEREST

The author has no conflict of interest with anyone in this study.

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