



Training of Cadres and Volunteers to Support Tuberculosis Elimination in Kutalimbaru Village, Deliserdang Regency

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Abstract: This community service activity aims to improve the knowledge, attitudes, and practices of community health cadres and volunteers regarding tuberculosis (TB) prevention and control. The program involved 30 cadres and volunteers from Kutalimbaru Village, Deli Serdang Regency, North Sumatra, Indonesia, and was conducted at the Kutalimbaru Village Head's Office. A Participatory Action Research (PAR) approach was employed through community engagement and participant recruitment, data collection and needs assessment, training sessions, distribution of TB educational pocketbooks, and evaluation using pre-test and post-test questionnaires. The data were analyzed descriptively using frequency and percentage distributions, and participants' pre-test and post-test results were compared across knowledge, attitude, and practice categories. Before the intervention, the majority of participants demonstrated insufficient levels of knowledge (83.33%), attitudes (83.33%), and practices (80.00%). Following the intervention, 96.67% of participants achieved a good level of knowledge, while 93.33% attained good levels of attitudes and practices. The program also established the "Great Cadres and Volunteers, Together to Eliminate TB" group as community-based agents for TB education and support. Overall, the findings indicate that structured and interactive training supported by practical educational materials effectively strengthens the readiness of community health cadres and volunteers to provide TB education, encourage early case detection, promote treatment adherence, and reduce TB-related stigma within the community. Integrating trained cadres and volunteers into village health programs, supported by continuous mentoring and regular monitoring, has the potential to strengthen sustainable community-based TB prevention and control initiatives.

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Introduction

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis** that spreads primarily through airborne droplets released when an infected person coughs. Although TB most commonly affects the lungs, it can also involve the kidneys, bones, joints, meninges, lymph nodes, and other organs (Gopalaswamy et al., 2020; Liebenberg et al., 2022; Migliori et al., 2021; Solihin & Alifah, 2021; Verma et al., 2024). TB remains a major global public health problem, with approximately 10 million cases and 1.5 million deaths reported worldwide, affecting men more frequently than women, partly because of greater exposure to risk factors such as smoking, alcohol consumption, occupational activities outside the home, and poor treatment adherence (Ekawati et al., 2022; WHO, 2023). Indonesia currently has one of the highest TB burdens globally, ranking second after India, with more than 700,000 detected cases in 2022 and an estimated 809,000 cases in 2023



(Organization, 2023). Household members face a particularly high risk of infection because of prolonged close contact, shared living spaces, and limited knowledge of TB prevention and infection control (Eom et al., 2018). In response, Indonesia has targeted TB elimination by 2030 by increasing case detection and treatment coverage, achieving treatment success rates of at least 90%, expanding tuberculosis preventive therapy, reducing TB incidence by 80%, and lowering TB mortality by 90% (Indonesia, 2021). Strengthening TB cadres' communication skills is therefore essential because inadequate communication may contribute to low case detection, poor treatment adherence, limited preventive therapy uptake, initial loss to follow-up, and treatment dropout (Ummiyati et al., 2025).

The burden of pulmonary TB in Indonesia is concentrated mainly in Java and Sumatra, with North Sumatra reporting a substantial increase from 41,057 cases in 2022 to approximately 43,000 cases by October 2023 (RI, 2023; Septiani et al., 2025). Based. The pulmonary TB case notification rate in North Sumatra rose from 104 per 100,000 population in 2017 to 183 in 2018 and 232 in 2019, with West Nias and Medan recording some of the highest district-level rates (Dinkes Sumut, 2024). In Deli Serdang Regency, the proportion of presumptive pulmonary TB cases increased from 64.67% in 2020 to 66.32% in 2021, while 1,698 TB cases were reported in 2021. At the local level, Kutalimbaru recorded 157 targeted cases in both 2019 and 2021, but only 52 and 44 patients, respectively, received treatment, indicating persistent gaps in case detection and treatment coverage despite the implementation of Presidential Regulation No. 67 of 2021 on Tuberculosis Control (Dinkes Kab Deliserdang, 2023).

People of productive age are the most commonly affected group in TB cases, according to the 2022 TB Control Program Report (Ministry of Health of the Republic of Indonesia, 2022). Many patients are forced to interrupt work or education due to the long treatment duration and drug side effects, which in turn creates financial hardship because of reduced or lost income. In response, the government through Law No. 67 of 2021 on Tuberculosis Control targets TB elimination by 2030, requiring collaboration across government, private sector, and community stakeholders. At the community level, TB cadres play an important role in case detection and patient support until recovery. Activities such as Household and Non-Household Contact Investigation (IK) also help increase case finding while simultaneously providing education to the community about TB prevention and control.

Tuberculosis (TB) control is a shared responsibility between the government and the community. The community plays a crucial role in preventing and eradicating TB (Sonoyati et al., 2024; Yanti et al., 2022). Therefore, community mobilization plays a crucial role in preventing and eradicating TB. Successful TB control relies not only on the availability of medical personnel, paramedics, medicines, and counselors. Equally important is the support of local leaders, such as community cadres, the Family Welfare Movement (PKK), and community leaders, as drivers of community participation in supporting and ensuring the success of TB prevention and control programs (Musa, 2023; Saraswati & Lubis, 2020).

Knowledge is the result of human sensory perception obtained through the five senses, such as sight, hearing, smell, and others, which allows individuals to recognize and understand objects or events. The level of knowledge within a family influences the effectiveness of preventing pulmonary tuberculosis transmission at the household level. Better knowledge tends to shape more appropriate attitudes and behaviors in preventing TB transmission. In this context, knowledge plays a key role in determining individual actions, as it forms the basis for behavior that supports disease prevention (Notoatmodjo, 2012).



The research findings of Lalla & Arda (2022) indicate that community empowerment is key to preventing pulmonary Tuberculosis. This article emphasizes the importance of increasing knowledge and active community participation in early detection, treatment support, and environmental improvement. Results include increased awareness, changes in healthy behavior, active participation in TB programs, a potential reduction in cases, and strengthened social support for patients. In conclusion, community empowerment is a crucial strategy in combating TB. (Lalla & Arda, 2022).

Previous studies highlight the importance of family and community involvement in TB prevention. (Andriani & Sukardin, 2020) found that better family knowledge and positive attitudes were associated with stronger TB transmission prevention practices, indicating the need for health education that strengthens both understanding and supportive attitudes. Similarly, (Ismawati et al., 2023) reported that TB prevention training improved the knowledge and skills of Posyandu cadres and community leaders, enabling them to promote public awareness and support village-level TB control efforts.

In the fight against Tuberculosis (TB), cadres and volunteers play a vital role as bridges between health programs and the community. They help find new TB cases, especially among vulnerable groups, by recognizing early symptoms and encouraging testing. After patients are diagnosed, they support treatment by reminding them to take medicine, helping overcome obstacles, and reducing stigma. Cadres also educate families and communities about TB prevention, healthy behavior, and the importance of supporting patients. In addition, they assist health workers with data collection, reporting, administration, and mobilizing community resources. Overall, TB cadres and volunteers are essential connectors, supporters, educators, and mobilizers in achieving a TB-free Indonesia.

The purpose of devotion is to improve the knowledge, attitudes, and actions of cadres and volunteers in the prevention and control of TB in Kutalimbaru Village, Deli Serdang Regency. Health education about pulmonary TB is one way to prevent its transmission. Health education is essentially an activity that conveys health messages to individuals, groups, or communities. With these messages, it is hoped that individuals, groups, and/or communities will gain more health knowledge. (Kusyani & Vidhiastutik, 2024; Putri et al., 2022). These community service activities—investing in training cadres and volunteers—are key to the success of educational programs. They are valuable assets with significant potential to drive positive change in the community.

Method

The community service activity implementation method uses a participatory action research (Baum et al., 2006) approach across the engagement/intake and data collection stages. It includes needs assessment, TB prevention and control training, and evaluation using pretests and post-tests. This community service activity was carried out in Kutalimbaru Village, Deli Serdang Regency, with the main target being cadres and volunteers as participants in the TB prevention and control training. The activity began with a meeting with village partners as part of the engagement/intake stage to build trust, agree on participant involvement, and prepare for the program's implementation. In the field implementation, the village head serves as a partner who supports the activity from the planning stage through implementation, including facilitating the training venue, so the activity can begin with an opening by the village head as a form of support for the program.

After the activity opened, the community service team delivered a presentation on TB prevention and control to cadres and volunteers. The material provided focused on increasing



participants' knowledge of TB transmission, prevention, and control as part of the program's health education interventions. The material was delivered in a structured manner, enabling participants to understand the training content well and actively participate in each stage of the activity. The activity began with an opening address by the Head of Kutalimbaru Village in support of the cadre and volunteer training program. Next, the community service team provided counseling on TB, covering its definition, transmission, main symptoms, prevention efforts, the importance of early examination, the importance of completing treatment, and the role of families and communities in supporting TB patients.

To support participants' understanding, the community service team used pocket books as educational materials during the training, as the educational media program design included their use to deliver TB information. The pocket books were distributed to cadres and volunteers after the presentation so they could study them, understand them, and reuse them as simple reading material during the training. With the pocket books, participants had a more practical grasp of the material, allowing them to independently reread the information presented by the community service team.

Before the training began, participants took a pretest to assess their initial knowledge of TB prevention and transmission. After all the material was presented and participants studied the provided handbook, the activity continued with a post-test using a questionnaire instrument to assess changes in participants' knowledge after the training. This series of activities demonstrated that the training was not only delivered in the form of material, but also included learning media and evaluation to assess cadres' and volunteers' increased understanding of TB. The data were analyzed descriptively using frequencies and percentages. Participants' knowledge, attitudes, and practices were categorized as good, sufficient, and insufficient based on the questionnaire scoring criteria. Changes following the intervention were assessed by comparing the frequency and percentage distributions of the pretest and post-test categories. No inferential statistical test was performed because this community service activity focused on describing changes in participants' knowledge, attitudes, and practices after the training.

Result and Discussion

Exploration Stage

The initial phase of the activity was carried out through coordination with partners, including the Kutalimbaru Village government, the head of the community health center, health cadres, and volunteers. At this stage, the community service team conveyed the program's aims and objectives, outlined the implementation plan, and engaged partners to ensure the program met the needs of the local community. Partners responded positively to this activity, as Tuberculosis remains a health issue that requires collective attention.

Community Service Implementation Process

This Community Service activity was held at the Kutalimbaru Village Head's Office, Deli Serdang, North Sumatra. This activity was initiated by a team of lecturers from the Medan Ministry of Health Polytechnic of Health accompanied by 3 students. This activity aims to increase the knowledge and awareness of cadres, volunteers, and the community about the dangers of Tuberculosis (TB), including its transmission, prevention, treatment, the importance of treatment adherence, and the role of cadres and volunteers in preventing TB in the community. In addition, this activity aims to form "Great Cadres and Volunteers, Together Eliminating TB" as agents of change who actively convey health information, accompany the community, reduce stigma against TB sufferers, and support the TB



prevention and control movement in Kutalimbaru Village. Through this activity, cadres and volunteers are expected to encourage community involvement in the TB-free, healthy living campaign as part of promotive and preventive efforts.

a) Series of Community Service Activities

The activity began with logistical and technical preparations by the community service team. All educational equipment and media were prepared, ranging from infocus, leaflets, pocket books, and questionnaires to symbolic equipment such as sashes for "Great Cadres and Volunteers, Together Eliminating TB". The activity was officially opened with a prayer. The event continued with remarks from the Head of Kutalimbaru Village who expressed his appreciation to the community service team for their attention and contributions in providing health education to the community, especially regarding the prevention and control of Tuberculosis, which remains a public health challenge.



Figure 1. Welcome remarks by the Village Head

The head of the community service team also gave a speech and introduction regarding the importance of training cadres and volunteers as drivers of TB elimination at the village level. Cadres and volunteers are seen as having a strategic role because they are close to the community, can convey health information directly, and can help reduce stigma against TB sufferers. The counseling and training session was then carried out in several parts: Opening and direction of the activity, Pretest of knowledge, attitudes, and actions of cadres/volunteers, Introduction to Tuberculosis: definition, causes, symptoms, and methods of transmission, Prevention of TB in families and communities, TB treatment and the importance of adherence to taking medication, Stigma against TB sufferers and how to reduce it, and The role of cadres and volunteers as Great Cadres and Volunteers, Together to Eliminate TB.



Figure 2. Presentation of Material by the Community Service Team



The delivery of the material is tailored to the participants' ages and is packaged interactively, with light discussions, visual illustrations, and simple case studies that are close to community life.

b) Evaluation and Educational Intervention

Following the outreach and training sessions, cadres and volunteers were given a post-test questionnaire to evaluate their knowledge, attitudes, and practices related to tuberculosis prevention and control. The questionnaires were completed under the guidance of the community service team and students to ensure all participants understood each question. This evaluation was conducted to assess changes in the cadres' and volunteers' understanding after participating in the educational activities. In addition, the community service team observed participants' active participation in discussions, their ability to understand the material, and their readiness to relay information about Tuberculosis to the community.

c) Formation of TB Elimination Drivers and Role Symbolization

The activity continued with the formation of cadres and volunteers as TB Elimination Activists in Kutalimbaru Village. The selection and role strengthening process was based on participants' active participation during the training, their understanding of the material, their communication skills, and their willingness to serve as an extension of the community service team in conveying health messages to the community. The cadres and volunteers involved were given role reinforcement through the phrase "Great Cadres and Volunteers, Together in Eliminating TB."



Figure 3. Embedding of Great Cadres Together with TB Elimination

As a symbol of social responsibility, participants designated as TB Elimination Activists were given sashes bearing the slogan "Great Cadres and Volunteers, Together Eliminating TB." The sash was presented by the Head of Kutalimbaru Village along with the community service team. This moment served as a form of appreciation for the cadres and volunteers. It emphasized their crucial role in helping the community recognize TB symptoms, prevent transmission, reduce stigma, and encourage TB sufferers to adhere to treatment.

d) Impact and Follow-up

Based on field observations and post-test results, this activity demonstrated an increase in cadres' and volunteers' understanding of TB, particularly regarding symptoms, transmission, prevention, the importance of early screening, medication adherence, and the need to reduce stigma against TB sufferers. Cadres and volunteers also demonstrated enthusiasm for engaging in follow-up activities, including educating families and the community, distributing leaflets and handbooks, and supporting the installation of TB posters in public places. The formation of "Great Cadres and Volunteers, Together to Eliminate TB"



is expected to be the first step in strengthening the community movement in TB prevention and control in Kutalimbaru Village. As a follow-up, the community service team plans to periodically monitor the role of cadres and volunteers in collaboration with the Kutalimbaru Village Head, village officials, health cadres, volunteers, and the community. This follow-up is aimed at ensuring that educational activities do not stop during training and can continue as a joint movement towards a healthier, TB-free Kutalimbaru Village.

Table 1. Frequency Distribution of Characteristics of Cadres and Volunteers

Respondent Data	Frequency	Percentage (%)
Participant		
Cadres	25	83,3
Volunteers	5	16,7
Gender		
Man	2	6.6
Woman	28	93.4
Age		
20-30 years	8	26.6
31-40 years	15	50
50-60 years	6	20
>61 years	1	3.4
Total	30	100%

Before and after this activity, the knowledge, attitudes, and actions of cadres and volunteers regarding the prevention and management of pulmonary TB were measured. The community service team and students conducted this assessment of knowledge, attitudes, and actions.

Table 2. Frequency Distribution of Knowledge, Attitude, and Action Categories of Cadres and Volunteers (n=30)

Variables	Pretest		Post Test	
	n	%	n	%
Knowledge				
Good	0	0.00	29	96.67
Enough	5	16.67	1	3.33
Not enough	25	83.33	0	0.00
Attitude				
Good	3	10.00	28	93.33
Enough	2	6.67	2	6.67
Not enough	25	83.33	0	0.00
Action				
Good	3	10.00	28	93.33
Enough	3	10.00	2	6.67
Not enough	24	80.00	0	0.00
Amount	30	100%	30	100%

Based on Table 2, the pretest results show that the knowledge of cadres and volunteers before the training was still in the low category. A total of 25 people (83.33%) were in the poor category, 5 (16.67%) were in the sufficient category, and no participants were in the good category. After the training and education, there was a clear improvement: 29 people (96.67%) were in the good category, and 1 person (3.33%) was in the sufficient category. These results indicate that the educational intervention improved cadres' and volunteers' understanding of tuberculosis prevention and control.



Improvements in the attitudes and actions variables were also seen after the training. Before the training, the majority of cadres and volunteers had poor attitudes (25 people, 83.33%), while after the training, 28 people (93.33%) moved into the good category. The same thing also occurred in the action variable: before training, 24 people (80.00%) were in the poor category; after training, this increased to 28 people (93.33%) in the good category. Thus, the training of cadres and volunteers not only increased knowledge but also improved attitudes and encouraged positive actions to support TB elimination in Kutalimbaru Village.

Discussion

The descriptive findings showed immediate improvements in participants' knowledge, attitudes, and practice-related scores following the training. The most substantial change occurred in the practice variable, in which the proportion of participants in the good category increased from 10.00% before the intervention to 93.33% after the intervention. However, this result should be interpreted cautiously. Because the post-test was administered immediately after the training, the increase does not necessarily represent sustained practices performed by cadres and volunteers in the community. Instead, it may primarily reflect improved understanding of recommended actions, greater confidence in carrying out their roles, and increased readiness or intention to apply the training material.

The mechanism underlying this immediate improvement can be explained using Social Cognitive Theory. According to (Islam et al., 2023) health-related behavior can be understood through Social Cognitive Theory, which emphasizes the interaction of behavioral capability, self-efficacy, outcome expectations, self-regulation, and environmental influences. In this activity, the structured presentation strengthened participants' behavioral capability by improving their understanding of how to recognize presumptive TB symptoms, provide community education, encourage early examination, support treatment adherence, and reduce stigma. Interactive discussions, visual illustrations, and case examples helped participants connect theoretical information with situations commonly encountered in the community. The pocketbook also functioned as a practical reference and environmental cue that participants could use when explaining TB prevention and control to families and community members.

Participants' readiness to act may also have been strengthened by social and institutional support during the activity. The involvement of the Kutalimbaru Village Head, the formal designation of participants as "Great Cadres and Volunteers, Together to Eliminate TB," and the presentation of role-symbolizing sashes reinforced participants' perceived responsibilities and social recognition. From the perspective of the Theory of Planned Behavior, these elements may have improved attitudes toward TB-related activities, strengthened subjective norms supporting cadre involvement, and increased perceived behavioral control by providing clearer roles, information, and educational resources (Hagger & Hamilton, 2025). These mechanisms offer a plausible explanation for why participants reported markedly better practice-related responses immediately after the intervention.

The findings are consistent with previous empirical evidence, although the evidence should be interpreted according to the outcomes measured. (Boy, 2015) and (Asrina et al., 2024) found that TB-related training improved cadres' knowledge, while (Maksuk et al., 2025) reported improvements in knowledge, attitudes, and responses following TB screening education. Similarly, the literature review by (Mulyati et al., 2020) showed that health education generally improved cadres' knowledge of pulmonary TB. Collectively, these studies suggest that training can rapidly influence cognitive and motivational determinants of behavior. Nevertheless, improvements in knowledge, attitudes, and intended responses do not



automatically demonstrate that participants consistently perform the expected activities in real community settings

The distinction between behavioral intention and actual behavior is particularly relevant to the present activity. Previous theoretical and empirical literature has shown that individuals may intend to perform a health-related behavior but fail to translate that intention into sustained action without specific planning, continued self-efficacy, supervision, and action control (Haag et al., 2023). Therefore, the observed post-test improvement should be considered an immediate change in self-reported practice-related readiness rather than definitive evidence of long-term behavioral change. Future evaluations should include follow-up assessments, activity records, supervisory observations, and objective indicators such as the number of community education sessions, individuals with presumptive TB referred to the Community Health Center, and patients receiving treatment-adherence support.

Conclusion

Training for cadres and volunteers in Kutalimbaru Village, Deli Serdang Regency, has proven effective in improving knowledge, attitudes, and actions related to the prevention and control of Tuberculosis (TB). Before the training, most participants were in the poor category. However, after the educational intervention, the majority of cadres and volunteers achieved the good category: 96.67% for knowledge and 93.33% for attitudes and actions. This confirms that the participatory action research approach, structured materials, interactive methods, and educational media, such as pocketbooks, can improve participants' understanding and readiness to act as agents of change. The formation of "Great Cadres and Volunteers, Together to Eliminate TB" symbolizes their strategic role in supporting the community's TB elimination program. The continued role of cadres and volunteers through regular monitoring is expected to sustain the positive impact and encourage the Kutalimbaru Village community to move towards a healthier, TB-free condition.

Recommendation

To ensure the long-term impact and institutional sustainability of the TB elimination initiative in Kutalimbaru Village, the following actions are recommended: (1) For the Local Government and Community Health Center (Puskesmas): Trained cadres and volunteers should be formally integrated into village-level TB prevention and control activities through regular mentoring, refresher training, supervision, activity reporting, and coordination with the Community Health Center. Adequate operational support, educational materials, and clear referral mechanisms should also be provided. (2) For Future Community Engagement Initiatives: Future programs should include continuous capacity building, practical simulations, follow-up mentoring, and varied educational media. Longer-term evaluation is also needed to assess whether improvements in knowledge, attitudes, and practices are sustained and translated into community action.

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