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Education on Assistance for Drug-Resistant TB Patients Since Diagnosis to Community TB Cadres Through Cadre Training Activities in Kediri City in 2025

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Abstract

Drug-resistant tuberculosis (DR-TB) or drug resistance is a condition where TB germs can no longer be killed with first-line anti-tuberculosis drugs (OAT), so they must be treated with second-line OAT (Drug-resistant TB Patient Pocket Book, 2020). Drug-resistant tuberculosis (DR-TB) is still a threat in TB control and is one of the main public health problems in many countries in the world. The data collection technique in this activity was through a questionnaire survey given before and after the presentation of the material on Assisting Drug-resistant TB Patients. The sample was 46 participants who were TB Cadres from each Sub-district throughout Kediri City. The data analysis used in this activity by measuring the correct and incorrect answers between the pre- and posttests that had been filled out by the training participants. The results of the questionnaire filled out by the activity participants showed an increase in knowledge about Assisting Drug-resistant TB Patients Since being diagnosed. The success of drug-resistant TB treatment is also inseparable from the important role of the family, health workers, and patient companions who always support patients to undergo DR-TB treatment until completion. Effective assistance will affect the success of treatment, the patient's quality of life, and reduce the risk of transmission of drug-resistant TB in the community.

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INTRODUCTION

Drug-resistant tuberculosis plays a major role in the global challenge of antimicrobial resistance, frequently absorbing a substantial share of healthcare funding and resources in many countries where the disease is widespread (Liebenberg et al., 2022). Mono-resistant TB is defined as TB caused by an isolate that shows resistance to a single first-line anti-TB drug (isoniazid, rifampicin, ethambutol, or pyrazinamide). MDR-TB is defined as TB caused by an isolate that shows resistance to at least isoniazid and rifampicin (Jang & Chung, 2020). The ongoing transmission of drug-resistant tuberculosis (TB) remains one of the most pressing and complex obstacles to effective global TB control efforts (Seung et al., 2015). In 2021, an estimated 450,000 new cases of multidrug-resistant (MDR) or rifampicin-resistant tuberculosis (TB) were reported globally. However, only 37% of these cases were confirmed through laboratory testing and officially reported, and just 60% of those received successful treatment. Indonesia accounts for 13% of the global discrepancy between estimated and reported TB cases, making it the second-largest contributor to this gap. It also ranks among the top 10 countries with the highest number of untreated MDR/RR-TB cases. In high-burden areas, MDR-TB is primarily driven by direct transmission, meaning that undiagnosed and untreated individuals significantly fuel the continued spread of the disease (Lestari et al., 2023).

Drug resistance can arise due to genetic factors, prior treatment history, and other conditions such as coexisting diabetes mellitus. While some evidence suggests that a host's genetic predisposition may play a role in the development of multidrug-resistant TB (MDR-TB), the primary driver behind the emergence of resistant strains within the Mycobacterium tuberculosis complex is genetic variation within the bacterial genome. Factors linked to prior anti-tuberculosis treatment include incomplete or improper therapy, as well as poor adherence to prescribed regimens. A review of existing literature consistently indicates that a previous history of TB treatment is the strongest predictor of developing multidrug-resistant TB (MDR-TB). Multidrug-resistant TB (MDR-TB) often arises from past mismanagement of TB treatment, such as the use of inadequate first-line drug regimens, adding a single drug to a failing regimen, failure to detect existing drug resistance, and variability in the bioavailability of anti-TB medications that increases the risk of resistance development. Non-adherence to treatment is a significant contributor to acquired resistance, yet it is frequently underestimated by healthcare providers and can be difficult to anticipate. Factors like mental illness, alcohol use, drug addiction, and homelessness are known to increase the likelihood of poor treatment adherence (Rumende, 2018).

Drug-resistant tuberculosis (TB) is believed to account for approximately 13% of all deaths attributed to antimicrobial resistance globally. Its spread is fueled by both the continued emergence of resistance and direct transmission between individuals. Delayed diagnosis and limited access to effective treatment further contribute to poor patient outcomes (Farhat et al., 2024). Resistance to Mycobacterium tuberculosis (MTB) arises from spontaneous, random chromosomal mutations that reduce the bacterium's susceptibility to specific drugs. Mechanisms contributing to this resistance include activation of efflux pumps on the bacterial surface, alterations to drug targets, production of enzymes that inactivate drugs, and interference with drug activation. Although multidrug-resistant TB (MDR-TB) occurs infrequently—given mutation rates of approximately 10^{-5} for isoniazid and 10^{-7} for rifampicin—resistance can develop in two forms: primary and secondary. Primary resistance occurs when individuals are infected with TB strains that are already drug-resistant, while secondary (or acquired) resistance develops due to factors such as poor medication adherence, drug malabsorption, or inadequate treatment regimens. While most MDR-TB cases have traditionally been linked to acquired resistance, evidence from high-burden areas suggests that direct transmission of resistant strains is now the leading cause (Jang & Chung, 2020).

Organizations and networks that have been carried out starting from the Central, Provincial, Regency/City Levels, DR-TB Health Service Facilities, DR-TB Satellite Health Service Facilities, Internal Networks, to External Networks have their respective roles in controlling drug-resistant TB cases in Indonesia. External networks are networks built with all health facilities and other institutions related to TB control, especially in the management of TB RO patients and facilitated by the local Health Office. The purpose of external networks is

for all DR-TB patients to get access to quality services and ensure the continuity of patient treatment until completion. Community support intervention in the Treatment of Drug-Resistant TB is one form of external networking built by the Ministry of Health with the Community with the aim of realizing TB Elimination in 2030. Assistance for drug-resistant TB patients provided by a TB Care Community starts from when the patient is confirmed positive for drug-resistant Tuberculosis (TB), until the patient is declared cured or complete treatment by the Clinical Expert Team (TAK) of the DR-TB treatment health facility (Kementerian Kesehatan RI, 2024).

The main responsibilities of the community support team in assisting drug-resistant tuberculosis (DR-TB) patients begin from the moment of diagnosis and continue throughout the course of treatment. Initially, the team provides support to patients from the time they are diagnosed with DR-TB until they begin treatment (enrollment), including accompanying them to health facilities for their initial or baseline examinations. This support continues from the start of treatment through to its completion, ensuring patients remain adherent and engaged. The team is also tasked with tracking cases of Initial Lost to Follow-Up (iLTFU) or general Loss to Follow-Up (LTFU), helping to re-engage these individuals in care. In addition, the community team is responsible for the distribution of enablers—both at the zeroth month (prior to or at the start of treatment) and throughout the treatment period—to help ease patients' financial and logistical burdens. Contact investigation is another critical duty, ensuring early identification of those who may have been exposed to DR-TB.

Specifically, the duties of the community support team include providing immediate assistance, conducting contact investigations, and distributing the Month 0 enabler as soon as the patient is diagnosed. They also ensure that patients complete their baseline examinations and help facilitate the timely initiation of treatment. Ongoing support is provided throughout the treatment period to encourage adherence. Additionally, the team is responsible for the monthly submission and distribution of on-treatment enablers to DR-TB patients. Throughout this process, they maintain close coordination with health facility staff and the patient's family to ensure a comprehensive and supportive care environment.

Providing education to community cadres about drug-resistant tuberculosis (DR-TB) from the time of diagnosis is a critical intervention that directly influences the trajectory of a patient's treatment journey and public health outcomes. At the point of diagnosis, individuals diagnosed with DR-TB often face fear, stigma, and a lack of understanding about the disease and its management. Educating community cadres—such as treatment supporters, community health workers, or peer educators—at this early stage ensures that they are prepared to offer immediate psychosocial support and accurate information to patients and their families. The study used a social cognitive framework to understand factors influencing treatment adherence among MDR-TB patients. It found that self-motivation, disease awareness, counselling, family, nutritional, and social support were key drivers of adherence. Healthcare providers emphasized the importance of motivational counselling and support systems. The study concludes that improving MDR-TB treatment adherence requires a patient-centered strategy that incorporates counselling, nutritional assistance, and community-based social support (Deshmukh et al., 2017).

Soon after diagnosis, trained cadres play a vital role in infection prevention and control (IPC) by advising households on key practices such as proper ventilation, cough etiquette, and safe caregiving, thus helping to reduce community transmission. The WHO (2019) highlights the importance of implementing IPC measures early in the patient care continuum to prevent the spread of Mycobacterium tuberculosis, particularly in resource-limited settings. Moreover, cadres are instrumental in reducing stigma and correcting misinformation from the outset. They are often trusted members of the community and can foster a more supportive environment for patients by dispelling myths and promoting understanding, which USAID and KNCV (2017) identify as a crucial factor in improving community acceptance of DR-TB patients.

In terms of training content, cadres receive structured instruction in several key areas. First, they are taught the basic science of TB and DR-TB, including modes of transmission, clinical symptoms, and diagnostic methods such as the use of GeneXpert technology (Kerschberger et al., 2019). Next, they are educated on treatment regimens, including differences between shorter and longer

regimens, and how to support patients in adhering to complex drug protocols while monitoring for side effects. The Union (2018) emphasizes the importance of cadre involvement in recognizing adverse reactions early and facilitating timely referrals to health services. Cadres are also trained in psychosocial counseling, enabling them to provide emotional support and reduce patient isolation—a key contributor to non-adherence. In addition to clinical and emotional support, cadres learn about infection prevention, including the use of masks, household disinfection practices, and community-level IPC strategies. They are also instructed on how to engage the wider community, conduct awareness sessions, and combat stigma using culturally sensitive communication strategies (Stop TB Partnership, 2020). Finally, they are trained in data recording, treatment monitoring, and referral systems, ensuring continuity of care and timely intervention when complications arise (WHO, 2023). Training is typically delivered through a combination of workshops, manuals, mentorship, and ongoing supervision to ensure that knowledge remains current and practice is aligned with national TB program guidelines.

METHOD

Education on Assistance for Drug-Resistant TB Patients Since Diagnosed to Community TB Cadres through Cadre Training Activities in Kediri City in 2025 was carried out face-to-face with 46 participants who were TB Cadres from each Sub-district throughout Kediri City. At the beginning of the training, participants were given a Pre-Test questionnaire containing the Basic Concept of Drug-Resistant TB and the mechanism of assistance for DR-TB patients, and at the end of the training session, participants were given the same questionnaire again, this was done to determine the extent to which the training participants had absorbed the material that had been presented by the resource person. The data collection technique in this activity was through a questionnaire survey given before and after the presentation of the Drug-Resistant TB Patient Assistance material. Data analysis used in this activity by measuring the correct and incorrect answers between the pre and posttests that had been filled in by the training participants.

RESULTS

The results of the questionnaire filled out by the activity participants showed an increase in knowledge about Assistance for Drug-Resistant TB Patients Since being diagnosed. This can be proven by the increase in the number of correct answers from 20 questions in the post-test at the end of the activity session.

Table 1. Distribution of Correct Answers for Activity Participants

	Average	Minimal	Maximal
Pre test	14.73913	11	18
Post test	18.58696	15	20
Pre-post test difference	3.847826	0	8

Source: Primary Data

Picture 1. Presentation of Resource Material

Picture 2. Technical explanation of questionnaire preparation

Picture 3. Discussion Season

Picture 4. Group photo

DISCUSSION

Based on the correct answer values for the pre- and post-test of educational activities, there was an increase in the knowledge of health cadres related to the material presented. Good knowledge can influence the awareness of health cadres to help MDR TB sufferers overcome their disease, one of which is through activities as drug monitoring supervisors. Assistance for drug-resistant TB patients since diagnosis is very necessary, this is because the level of transmission is relatively easy, namely through droplets of patients suffering from DR-TB when coughing, sneezing, even when talking to other people. The level of risk of potential XDR TB during inadequate drug-resistant TB treatment, to the presence of Drug Side Effects (DEF) during patients undergoing DR-TB treatment which often results in patients not wanting to take medication.

The result similar with other research, the training led to an 87% improvement in the cadres' ability to provide PMO (Directly Observed Treatment) counseling. Results from the Paired T-Test analysis showed a p-value of 0.000, indicating that the training had a significant impact on the cadres' knowledge of TB PMO. In summary, providing education and guidance to cadres positively enhances their knowledge and skills. It is expected that, as a result, TB care cadres will be capable of offering support and serving as coordinators for TB PMO (Drug Ingestion Supervisors) (Rosaline & Herlina, 2021).

Cadres play a crucial role in the success of programs aimed at enhancing health knowledge and skills within communities. Their involvement is particularly strategic in the treatment of pulmonary tuberculosis (TB), as they can function as health educators, assist in the early identification of suspected cases, refer patients to healthcare facilities, and serve as directly observed treatment (DOT) supervisors for TB patients. Given that many cadres do not have a background in health or prior knowledge of TB, proper training and guidance are essential to ensure their effective contribution to TB control efforts. According to the Regulation of the Minister of Health of the Republic of Indonesia (PMK-RI No. 60 of 2016), the success indicators for community and organizational involvement in TB treatment include an increase in the number of new TB patients referred by the community, an improvement in recorded treatment success rates among patients supervised by the community, and a decrease in the treatment dropout rate among TB patients under community supervision (Mukaromah, 2022). Knowledge serves as a fundamental basis for shaping an individual's behavior. A cadre's level of knowledge greatly influences their engagement and effectiveness in controlling TB within the community (Putri et al., 2024).

CONCLUSION

The education to enhance knowledge about Assistance for Drug-Resistant TB Patients effectively strengthened community-based management of drug-resistant TB (MDR-TB). The education improved cadres' knowledge, so they have chance have positive attitudes, and skills, enabling them to support patients from diagnosis through treatment completion. TB cadres play a vital role in ensuring treatment adherence, early case detection, patient monitoring, stigma reduction, and psychosocial support, acting as a key bridge between the healthcare system and the community. Their active involvement significantly contributes to better treatment outcomes and reduced dropout rates among MDR-TB patients.

SUGGESTION

There are ongoing educational activities for companions of drug-resistant TB patients. This is needed to improve the knowledge of cadres in accompanying drug-resistant TB patients since the patient was diagnosed with drug-resistant TB. Providing effective communication training for patient supporters so that tuberculosis patients are comfortable when communicating with patient supporters.

Given the success of this education in Kediri City, this education is highly recommended for replication in other regions, particularly in high-burden DR-TB areas. To ensure effective scale-up,

local health offices should collaborate with TB programs, community organizations, and national TB control initiatives. Adaptation of training materials to suit local languages, culture, and healthcare infrastructure is essential. Moreover, continuous mentoring, refresher training, and monitoring systems should be integrated to sustain cadre performance. This approach can serve as a cost-effective and scalable strategy to strengthen community-based TB care and support national goals for TB elimination.

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CONFLICTS OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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