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Challenges and Prospects in Pulmonary Tuberculosis: Case Finding: A Comparative Study

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Abstract — The study determined the challenges and prospects of TB case findings among patients and public health nurses in selected Rural Health Units in Guimba, Nueva Ecija. To collect the needed data, their socio-demographic profile was gathered using interview guide questions and subjected to in-depth discussion and analysis. The study utilized exploratory qualitative method of research design.

The patient respondents were middle-aged adults, mostly males, married, elementary school graduates, earning below-average monthly incomes, and residing far from the healthcare facility. The public health nurses are also young adults, mostly females, married, and mostly working in the health center for long years. The patient respondents encountered challenges such as distance to RHU, limited digital literacy, limited awareness and misconception, financial constraints, health literacy, and limited community involvement. For the health workers, results showed challenges in limited resources, limited interoperability, limited time for patient education, supply-chain issues, inconsistent training, and limited community engagement.

Prospects for the patient respondents include improved infection control measures, remote monitoring, community-based health education, improved access to essential medication, expanded TB health education, and strong partnerships with other organizations. The health workers have identified improved infection control measures, remote monitoring, community-based health education, access to essential medication, expanded TB health education and strong partnership with other organizations.

Keywords — challenges, prospects, case finding, health workers, Pulmonary Tuberculosis

I. Introduction

Active case finding is a method for tuberculosis screening that exhibits significant potential to augment the timely identification of cases in underserved communities. This approach is primarily directed toward demographic groups that are considered high-risk: individuals who are homeless, incarcerated, receiving care in nursing homes, and residing in economically disadvantaged regions. Unlike passive case-finding, active case-finding (ACF) involves actively searching for TB in individuals who would not seek care spontaneously. In the study done by Fenta et al. (2023) on the challenges in active TB cases-findings were found to be related to healthcare workers' experience, knowledge, and skills in detecting TB-ACF, distance and time; availability and workload of ACF healthcare workers. Identified barriers related to a lack of resources like

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diagnostic equipment/machines and reagents; the stigma associated with TB-ACF detection; the lack of training of current and new healthcare professionals to detect; communication strategies associated with TB ACF; and poor or no community awareness of Tuberculosis.

The challenges identified in the study of Shamanewadi et al. (2020) in the conduct of active case finding (ACF) were a shortage of staff, inadequate training of healthcare workers, indifferent attitude of the community due to stigma, illiteracy, lack of awareness about TB, inability to convince patients for sputum test and delay in getting results. According to Thekkur et al. (2020), the health system challenges in conducting active case-finding must be addressed by properly training the health staff involved in the activity and improving access to TB diagnostics.

The World Health Organization's (WHO) and its program End TB Strategy proposed the early diagnosis of TB through Active case finding (ACF) in high-risk groups as a key component to ending the TB epidemic by 2030. ACF requires healthcare providers to actively reach and provide access to TB diagnostic services for communities or population groups that are underserved or at higher risk of TB. ACF is beneficial in reducing the delay in TB diagnosis, out-of-pocket expenditure, unsuccessful treatment outcomes, and incidence of TB. The benefits of community-based ACF activity depend on the selection of high-risk groups, the prevalence of TB in the selected group, incentives provided to healthcare workers, the diagnostic algorithm adopted, and support provided to patients in completing the cascade of TB diagnosis and treatment. TB patients who go undetected or are not treated can be a potential threat to TB control efforts as they contribute to uninterrupted transmission of the disease. One of the possible reasons for undetected TB patients is over-reliance on passive case finding for diagnosis of Tuberculosis in low- and middle-income countries (Dey, 2019).

In the article of the Cleveland Clinic (2024), in the year 2020, about 10 million people became ill with TB throughout the world. About 1.5 million people died from the disease. Although Tuberculosis is infectious, it does not spread easily. People usually have to spend much time in contact with someone contagious to catch it. Tuberculosis can spread to other individuals when the person with active Tuberculosis spreads germs into the air through sneezing, coughing, talking, singing, or even laughing. Only people with active pulmonary tuberculosis infection are contagious. Most people who breathe or inhale TB bacteria can fight it off and prevent it from growing. However, if that person's immune system weakens, the bacteria can propagate and cause active TB. Tuberculosis can become active if the body's immune system weakens and cannot stop bacteria from multiplying.

The study conducted by Andom et al. (2023) on the barriers to PTB diagnosis and treatment found that clients at the hospital and clients at the healthcare center reported tuberculosis symptoms. Full diagnostic testing processes were completed; the results were 68% of clients at the healthcare centers and 66% at the hospitals. Among clients who initiated tuberculosis treatment, 68% completed treatment at the hospital and 74% at the health center. The identified barriers to testing and treatment completion were lacking decentralized diagnostic services, sample

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collection, socioeconomic factors, and high patient movement to search for jobs. The conclusion was that improving tuberculosis diagnosis is possible by effectively decentralizing laboratory services to local health facilities, and treatment completion can be enhanced by offering patients food and other types of social support.

In a related study, Pradipta et al. (2021) identified barriers in diagnosing and treating TB patients. The barriers were classified into socio-demography and economy, knowledge and perception of TB treatment, lack of TB knowledge and information, stigmatization, long distance to the health facility, adverse drug reaction, and loss of household income.

Men and women experience illness differently and encounter distinct challenges in accessing TB diagnosis and treatment. These challenges exist at both individual and health system levels. At the individual level, barriers include physical factors (such as distance and transportation), financial constraints (including direct and indirect costs), stigma (related to TB and HIV), limited health literacy, and sociocultural influences like gender roles and family status. On the other hand, provider and system-level barriers involve factors such as the provider's level of suspicion for TB, the number and types of healthcare providers consulted before a diagnosis is made, adherence to national TB program guidelines, and patients' satisfaction with TB services. Gaining a proper understanding of gender-related differences in these barriers and delays is essential for researchers and policymakers to develop and prioritize gender-sensitive interventions that enhance the global effectiveness of TB services (Yang et al., 2024).

Tuberculosis (TB) programs measure their successes by focusing on the number of patients screened, diagnosed, and successfully treated. Quality of care is related to health outcomes; therefore, addressing quality of care with users' access is a critical investment for TB programs. This is especially important because poor user access and quality of care can increase the rate of treatment default and failure, which are detrimental to the general health system. Among the patients who were diagnosed with Tuberculosis and started the treatment, only 71% of them concluded the treatment; this is because of some barriers in getting access to health services. Actively interfering with TB diagnosis and treatment are fear and stigmatization of TB, which are associated with improper knowledge of TB and society's treatment of individuals with the disease. This causes people to cover up symptoms, prevents seeking a diagnosis, and also affects the continuity of TB care and treatment. Patients are not only worried about being stigmatized by other people within the same community but also by their family members and the least expected group, the healthcare staff. They found that among TB patients, stigma was pervasive. It has been highlighted several times that people living in poor socioeconomic conditions have more cases of TB and difficulties in testing (Telbo et al., 2024).

This study explores the current challenges and prospects in TB case finding from the perspectives of patients and healthcare workers. This study seeks to comparatively examine the insights of TB patients and healthcare providers to understand whether their perceptions of challenges and potential improvements align or diverge.

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This study aims to identify and compare the standard practices shared by patients and health workers, such as knowledge of TB case findings, disease process, medication adherence, and support systems. At the same time, it will examine the differences in practices, including how patients manage symptoms or seek care versus how healthcare workers approach diagnosis, counseling, and treatment protocols.

By analyzing and comparing shared and differing practices, the study will highlight areas of common understanding and perceptions that can be reinforced in TB control programs and points of disconnect that may hinder treatment success. These insights can provide a basis for more aligned, patient-centered care strategies and inform policy adjustments that consider practical and cultural realities.

Theoretical/ Conceptual Framework

This study utilized the theory of Nola Pender on The Health Promotion Model (HPM) to explain the interactions that occur between an individual and their environment during the behavior change process. The goal of the HPM is to help individuals make behavior changes that will improve health outcomes and prevent and minimize the risk of disease. Health promotion can be defined as making healthy lifestyle decisions and choices to improve the overall health and wellness of individuals and communities. Health can be defined as physical fitness, mental stability, and social well-being, not just the absence of illnesses or diseases. Wellness can be defined as the attitudes and decisions an individual makes that result in positive behaviors and health outcomes.

The study explored the challenges and prospects in PTB: Case finding: a comparative study. Box number 1 is the independent variable that deals with the profile of the patient respondents in terms of their age, sex, civil status, highest educational attainment, monthly family income, occupation, and distance of residence from the health center, and health workers profile in terms of their age, sex, civil status, position, and number of years in service. Box number 2 is the data analysis of challenges and prospects in PTB case finding among patients and healthcare workers, health facilities, health information systems, health education, resources, knowledge, and community mobilization. Box number 3 is the emergent that focuses on the proposed intervention program to minimize client and health workers' challenges in active case finding.

II. Methodology

Research Design and Strategy

The study utilized the exploratory qualitative case study method with prepared interview guide questions to explore the challenges and prospects in PTB among healthcare workers and patients. A case study is a detailed examination of a person, group, or event to understand it better. Case studies help researchers understand a subject's key characteristics, meanings, and

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implications. Qualitative research is a type of research that explores, provides penetrating analysis and deeper insights into real-world problems. Instead of collecting numerical data points or intervening or introducing treatments just like in quantitative research, qualitative research helps generate a hypothesis to investigate further and understand quantitative data. Qualitative research gathers participants' experiences, perceptions, and behavior. It answers the hows and whys instead of how many or how much. It could be structured as a standalone study, purely relying on qualitative data (Tenny et al., 2022).

Population and Locale of the Study

The study determined the challenges in active case finding in PTB among healthcare workers and patients in selected rural Health Units (RHU) of Guimba, Nueva Ecija. It was delimited to those identified as nine (9) healthcare workers and nine (9) patients in selected RHUs of Guimba, Nueva Ecija. The study was conducted during the Second semester of 2024-2025.

Data Gathering Tools

The study utilized structured interview guide questionnaires as the primary data-gathering tool to explore the challenges in active case finding in PTB among healthcare workers and patients in selected RHUs of Guimba, Nueva Ecija. Part 1 of the data-gathering tool integrates a quick survey of the patient respondents' demographic profile, which includes age, sex, civil status, highest educational attainment, occupation, monthly family income, and distance of residence to the health center and the healthcare workers that include their age, sex, civil status, position and number of years in service.

Part two dealt with the challenges and prospects of active case finding in PTB among healthcare workers and patients of selected RHUs of Guimba, Nueva Ecija. The interview guides were formulated by the researcher and was validated by three experts. Their expert recommendations were meticulously integrated to enhance the instruments clarirty, validation and effectiveness. The guide questions obtained 3.63 mean interprered as “Valid”..

Data Gathering Procedure

The researcher requested permission from the Municipal Health Officer through the Public Health Nurses. Following the approval, the study commenced. The researcher conducted orientation regarding the study's purpose, process, and valuable benefits. The data gathering was scheduled based on the participants' availability and convenience.

Treatment of Data

The researcher cautiously identified categories and patterns of meanings. A coding system will be utilized to analyze the narrative challenges of participants in PTB case findings. These statements were termed as initial codes – each significant statement was then provided with meaning to uncover and highlight the participants' shared meanings, and these will be termed as

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categories and double-checked to ensure that they were relevantly grounded with the data. Then, the researcher will formulate meanings to organize clusters or categories. Furthermore, a summary of identified themes or patterns of meaning will be provided at the end of each participant's story.

Ethical Considerations

The researcher safeguarded and secured personal information obtained during data collection following the Data Privacy Act (RA10173).

The researcher ensured that ethical precautions and procedures were met. In the whole process of this study, the researcher considered ethical precautions to follow:

This researcher treats the respondents with their right to self-determination, autonomy, and the freedom to participate or not participate in the research. Self-respect for the persons indicated should be regarded as autonomous, anonymous, and private, as should the right to self-preservation and the freedom to participate or not participate in the research.

The researcher endeavors to treat his subjects fairly regarding the benefits and risks of the research. He will strictly observe the principles of fair justice and transparency.

This researcher grants the respondents their right to privacy and the use of free will to determine the time, extent, and general circumstances under which their private information was shared with or without the help of others. The respondent's right to exercise free will and right to privacy was provided. The researcher guarded personal data and private information with utmost care and strict confidentiality.

III. Results and Discussion

Profile of Respondents

Most of the participants, four (4) of them belonged to the age bracket of 40-59 years old, 20-39 years old (3), and 60 years old and above (2). Along gender, mostly were males (5) and females (4); along civil status, the majority of them were married (7) and single (2); along highest educational attainment, the majority were elementary school graduates (4), high school graduate (3), and bachelor's degree (2). Along with monthly family income, the majority are earning below average income of P10,957 a month (4), P10,957-P21,914 (3), P21,914-P43,828 (2) of them. Along the distance from their home to the healthcare facility, the majority of the participants reside three kilometers or more away from their homes (5), two kilometers (3), and less than one kilometer (1).

It revealed that the patient participants were young adults, male-dominated, had marital relationships, finished the secondary level of education, earned average monthly income, and resided far from the healthcare facility. According to the World Health Organization (WHO), A total of 1.25 million people died from Tuberculosis in 2023, including 161,000 people with Human

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Immunodeficiency Virus (HIV). Worldwide, TB has probably returned to being the world's leading cause of death(World Health Organization: WHO & World Health Organization: WHO, 2025). Men have a higher incidence and mortality rate of Tuberculosis (TB) compared to women. This disparity is seen across various age groups and is attributed to biological, socioeconomic, and behavioral factors (Marcoa et al., 2019).

Most participants' incomes are lower than those reported in the Philippine Statistics Authority ₱19,436 monthly income survey for 2025 (De Luna, 2025).

Based on the study's findings, all of the health workers were public health nurses, mainly in the 20-39 age bracket, mostly female (5) and male (4), married (6), and single (3). All of them held a position of Public Health Nurse (9) and had been in the service for more than seven (7) years and one to three years (2).

Globally, nurses' functions include detecting TB cases, monitoring and administering TB treatment drugs, training community health workers, and following up on people with TB (Ghebrehiwet, 2006, as cited in Baluku et al., 2023). However, all of these functions in TB case finding and treatment are just a part of the overall function of a nurse in the Rural Health Unit (RHU) handling all the other healthcare programs.

Theme 1: Challenges

Sub-theme 1: Facilities

The participants shared their experience going to the facility and noted that the distance to RHU from their residence was challenging.

> **Distance to RHU.** The distance to the health facility may delay diagnosis, interrupt treatment, and discourage patients from seeking regular care.
>
> Participant 1 stated, *"All RHUs have a designated and assigned barangay covered. The nearest RHU here in my barangay is RHU I. I was not admitted for consultation, and I was referred to another farther facility, RHU II in Brgy. St. John. I need to spend another travel fare again."*
>
> Participant 2 stated, *"RHU 3 should be placed within the town proper like the other two health centers. The check-up is at San Andres, and the free X-ray is available in the town proper. It is time-consuming and expensive for some of us who do not have our transportation."*
>
> Participant 8 stated, *"I am too old to travel from the RHU to another facility for the free X-ray. Traveling from my barangay to the RHU was already an effort because of the distance."*

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Participant 9 stated, *"Going to Guimba RHU is a bit far, the nearest RHU here is in the next town of Ramos, Tarlac. The travel fare is cheaper."*

The result from the respondents implies that there are geographic and accessibility challenges in utilizing healthcare services. There is unequal access to services depending on the barangay location and what RHU is responsible for catering health care services. The location of Rural Health Units (RHUs) is not always convenient for residents, particularly those from remote barangays. It discourages older adults from seeking care, potentially delaying diagnosis, and treatment. For some participants, limited daily living budgets made it difficult to afford additional expenses such as travel fares, posing a significant barrier to accessing care (Dotse-Gborgbortsi et al., 2022).

Limited Resources. The delay in medicine deliveries from the DOH provincial office and sometimes the availability of the vehicle that will retrieve the medicine post are challenges. The PBSP (Philippine Business for Social Progress) provides free X-ray vouchers, which were presented to a private laboratory, Goldstream.

Health worker 1 stated, *"There was a time we ran out of TB medicines. I assessed the patient's capacity to buy their own medicine, and we prescribed them the medicine and said we would inform them when the stock arrived. We do sometimes photocopy the free x-ray vouchers."*

Health worker 2 stated, *"Back then, I gave prescriptions when medicines were out of stock."*

Health worker 3 stated, *"Yes, we sometimes ran out of TB medications and the free X-ray vouchers from PBSP. They should have an updated MOA."*

Health worker 4 stated, *"There was a time that we ran out of medicines, and we needed to divide all the remaining medicines for each patient into one week-long medication, so I asked other RHUs if I could borrow some from their patients. There was also a time that we did not have free x-ray vouchers."*

Health worker 5 stated, *"Yes, there was a time when TB drugs were limited. I think the TB coordinator sometimes borrows from other TB coordinators within the province."*

Health worker 6 stated, *"There were a few months when I think we have a stock-out of medicines."*

Health worker 7 stated, *"There was a time we ran out of TB medicines for adult and pediatric patients."*

Health worker 8 stated, *"We had a limited stock of facemasks for the patients and staff. We also experienced an out-of-stock of TB medicines before."*

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Health worker 9 stated, *"I remember that the TB coordinator told me that I need to make a prescription for those who are getting Rifampicin bottles for pediatric patients."*

The result from the responses of health workers implies that limited resources were a challenge, although they had not been a longstanding concern. The shortages concerning medical supplies such as TB medications, free x-ray vouchers, and personal protective equipment undermine the continuity and effectiveness of TB case management and prevention efforts. Ereso et al. (2020) have identified inadequate resources and limited access to TB diagnostic services as a barrier to TB case finding.

Sub-theme 2: Health information system

Electronic Health Records, or digital health records, are crucial for improving healthcare by reducing costs and waiting time and supporting patient-centered practices. Patients and health workers identify barriers due to the lack of electronic health records.

Limited digital literacy. Limited exposure to gadgets and the Internet has shown that receiving health information digitally is challenging.

Participant 2 stated, *"I do not know how to access health information online."*

Participant 4 stated, *" I am unfamiliar with how a mobile phone works."*

Participant 6 stated, *"I have seen and used Facebook before, but sometimes I get confused and accidentally open other applications, so I need someone to teach me."*

Participant 8 stated, *"I do not have a mobile phone, and I do not know how to use one, so I may not access any health information from the Internet."*

Participant 9 stated, *"I do not have a modern mobile phone. My son has one, and I do not know how to use it. I am only using my mobile phone for calls. I am more comfortable in personal health education than the Internet."*

The respondents' results imply that although health information is readily available on the Internet and may be accessed anytime, there is limited digital literacy and accessibility, particularly among older and less technologically proficient people. Limited digital knowledge is disadvantageous because most participants show low or no digital literacy, which will limit their participation in digital-era activities (Mullins, 2022).

Limited Interoperability. The Integrated TB Information System (ITIS) is a web-based, electronic system used in the Philippines that serves as the official reporting tool for the Department of Health (DOH) 's National TB Program. Most health workers identified not having access to the computer program and greatly relying on paper records. The iClinicSys is an integrated clinic information system that generates national health reports and electronic medical

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records for primary health care facilities like rural health units and health centers. It aims to automate service delivery processes to efficiently monitor patient care.

> All Health workers stated,"*We have iClinicSys. We are oriented on the system but it is not fully implemented in all RHUs."*
>
> Health worker 1 stated, *"I need to ask the TB coordinator personally if the patient has already enrolled. I do not have any access to ITIS. There is also a problem when we must consolidate or create monthly, quarterly, and annual reports because all data will be verified on ITIS, not the papers being filed."*
>
> Health worker 2 stated, *"We do not have a digital health system for admission, so we use pen and paper for the initial interview at the front desk. Only the 3 TB coordinators have access to ITIS. I must wait or ask permission to borrow the file records in the folder for personal review. We are oriented about Iclinicsys but we are not using it."*
>
> Health worker 3 stated, *"We do not have access to ITIS, which can tell us if the patient is classified for re-treatment, has previous records in the past year, or has been treated in a different health facility. We are still in the implementation of Iclinicsys."*
>
> Health worker 7 stated, *"All patients transferring from private facilities to our facility and had started treatment have no records in the ITIS. Not all patients are recorded in ITIS and contact-traced in the barangay."*
>
> Health worker 8 stated, *"I am in charge of admission. I handle written-in pen records and folders that will be filed. The admission record file differs from the treatment record file, which the treatment nurse does. Admission Folders were sometimes lost within the facility. Midwives and nurses are recording folders and sometimes forget to return them or misplace them. The clients also forgot the folder number. I have not seen the ITIS program and do not know how it works for recording. We are not yet using the Iclinicsys even though we are oriented."*
>
> Health worker 9 stated, *"Looking for a lost record file is time-consuming, and sometimes we duplicate or create a temporary record and file it again in the original file until we find it. I have not seen the ITIS program."*

The respondents' result implies limited access to the ITIS program and iClinicSys, which significantly hampers the efficiency of TB case management, reporting, and continuity of care. The workflow is inefficient, and reporting is delayed, especially when compiling monthly, quarterly, or annual reports, causing delays and increasing the risk of errors. There is no quick access to information because no computer database can produce quick validation and results. All paper-based information is just considered RHU-owned health data (Torab-Miandoab et al., 2023). Paper-based records alongside digital records may lead to redundancies and data fragmentation

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and have a higher risk of misfiled or lost records, as respondents 8 and 9 have stated. There is also a challenge to the continuity of patient care if there is the inability to access patient histories through ITIS that should confirm whether a patient is a re-treatment case or if they were previously treated at another facility. As stated by Participant 7, there is a limit to contact tracing, surveillance, and epidemiological tracking because transferred patients and those from private health facilities are not recorded in ITIS. Several health workers have never used or seen the ITIS platform, which indicates a lack of orientation and capacity-building. The rural health staff are oriented and trained on iClinicsys but is not implementing and using the DOH health information system.

Sub-theme 3: Health education

Health education activities were conducted in various barangays to raise awareness of disease prevention and disseminate essential information and sometimes medicinal goods to prevent diseases.

Limited Awareness and Misconception. When people rarely interact with healthcare providers, they may not have the opportunity to ask questions or correct false beliefs.

> Participant 1 stated, *"I did not attend any barangay health education about TB; I only know the information about TB from the television, Facebook, and stories of other people. I was educated in the RHU during my treatment."*
>
> Participant 2 stated, *"The nurse corrected me when I said that I got TB because I let my dogs sleep inside my room."*
>
> Participant 3 stated, *"I thought that my cough was only caused by dust because I worked in a construction site in Tarlac."*
>
> Participant 4 stated, *"I was scared at the time when I was diagnosed with Tuberculosis, I thought I would die soon. The nurse reassured me and explained to me that I would be cured just as long as I followed the medication regimen."*
>
> Participant 5 stated, *"The signs/symptoms and cause of TB were discussed during FDS health education and also before I started medication. I did not have factual knowledge about the disease before I got TB. All I know about TB is that you are coughing with blood. The nurse discussed the complications and emphasized my medication and contact tracing."*
>
> Participant 9 stated, *"My proper education about TB was during the start of my medication for TB. Nursed explained to me the disease and the importance of diagnosing my family, too."*

The result from the participants' responses implies that limited interaction with healthcare providers results in misconceptions, delayed awareness, and fear about Tuberculosis. There is a

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crucial gap in early community engagement where there are community health education activities. For many, accurate knowledge about Tuberculosis only became accessible after diagnosis, often during treatment initiation. Improving health literacy through health awareness campaigns and community health education is crucial for enhancing treatment outcomes and strengthening the fight against Tuberculosis (Chauhan et al., 2024).

Limited Time for Patient Education. Healthcare providers must juggle many tasks simultaneously to accommodate all kinds of patients and functions.

> Health worker 1 stated, *"I sometimes discuss only the basic details in the simplest way possible in the shortest time if I am rushing because there are also other health programs that I need to attend to."*
>
> Health worker 2 stated, *"If I am loaded with other activities, I sometimes ask the patients what they know and teach them those that need clarification."*
>
> Health worker 4 stated, *"Sometimes I ask other nurses to do the health education if I am doing some paperwork."*
>
> Health worker 7 stated, *"I did a quick and basic discussion of TB for health education, and I focused on the medication process."*

The health workers' results suggest limited time for patient education because they manage multiple tasks at once, including patient care, assessment, medication administration, documentation, and all the other health programs they cater to at the RHU. According to Kigozi et al. (2017), health education efforts are needed to assess patients' understanding and address any misconceptions to strengthen the dissemination of accurate information and promote sound tuberculosis knowledge and attitudes.

Sub-theme 4: Resources

> Health resources are essential in the delivery of effective healthcare services.

Financial Constraints. Using out-of-pocket expenses to acquire health services is a challenge for the participants.

> Participant 2 stated, *"I started medication in a private clinic in Manila; I just shifted to the RHU because someone told me it is free. The medicine price for me is high; it is good that it is free there in the RHU."*
>
> Participant 5 stated, *"I am a 4Ps member. Life is hard, and being sick is a burden. It is good that the RHU has free check-ups and medication."*
>
> Participant 6 stated, *"I was reluctant to seek medical care, as taking time off work would result in a financial loss."*

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Participant 8 stated, *"I asked the BHW if she would go to town and retrieve my medicine supply for a month. I do not have enough money to spend on travel fare."*

Participant 9 stated, *"I had limited money for transportation to town. It was good that there were free x-rays here in the barangay. I was diagnosed and treated for free. Medicines were also free. I had transportation assistance from the barangay during my initial check-up in the RHU."*

The respondents' results suggest that transportation costs can be challenging and can significantly affect TB treatment and care (Abaynew et al., 2025). Transportation costs are influenced by distance since longer distances typically result in higher expenses.

Supply-Chain Issues. The health worker participants identified that there were occasional out-of-stock issues.

All Health workers confirmed and stated, *"Yes, there are times that there are delays in the deliveries of stocks of medicines from the Department of Health."*

Health worker 4 stated, *"Sometimes, there was also a delay in releasing the budget for gasoline for ambulances or in scheduling the use of ambulances that would retrieve the stocks from the provincial office."*

The results from the health worker respondents imply that even though they are monitoring the medicine stock, the delay will sometimes be due to the distribution of the DOH regional or provincial office. Delays also happen when the vehicle is unavailable. Delays and shortages in health supply can lead to delayed interventions and management, resulting in health-related and financial problems for patients (Authors et al., 2023).

Sub-theme 5: Knowledge

Health knowledge empowers individuals to make informed disease prevention, treatment, and well-being decisions.

Health literacy problems. This has shown participants' inability to understand health education/instruction, access health information, and act on health information.

Participant 3 stated, *"I was corrected by the nurse when I said that I let my wife drink a few of my TB tablets because she has a cough, too."*

Participant 4 stated, *"I had an on-and-off cough for a month; I thought it was just because of the dust or the weather. I know that TB symptoms include cough for more than a week, but I waited for more than a month to seek medical help."*

Participant 8 stated, *"I did not understand some of the nurse's instructions. There are words that I do not know. The nurse verified if I understood, but I was shy about saying that I did*

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not understand some parts and forgot some instructions. Maybe it was because of my old age."

Participant 9 stated, *"I am Ilocano. I do not know some English and Tagalog words in barangay health education."*

Health surveillance is an essential part of the operation of health systems today (Rechel et al., 2019), so everyone must possess health literacy to identify signals that may cause health problems properly. The respondents' results implied that there were health literacy issues. Emphasis on individualized treatment should be taught. The communication barrier is a factor that hinders the understanding of health education. The delivery of words should be understandable and clear. A clear audience understanding is crucial to delivering practical and relevant health education.

Inconsistent Training. When training is irregular, outdated, or not standardized across staff, it may result in varying competency levels and understanding.

Health workers 1, 3, and 6 stated, *"I have online TB training on MOP 6th Edition. I do not start patients' medications."*

Health workers 2, 5, and 7 stated, *"I have completed online TB training on Manuals of Procedures 6th Edition and was oriented by the TB coordinator on starting patients' medications."*

Health worker 4 stated, *"As a TB Coordinator, I have completed all TB Training and all DOH seminars. I am trained in the ITIS program and report consolidation."*

Health workers 8 and 9 stated, *"I do not have any training; I am just assessing patients for admission."*

The result of the statements of the health workers implies that there is a gap of knowledge for some healthcare workers on the complete process of TB case finding and treatment. Some may have lesser knowledge because they are not trained to do the task and are not responsible for registering and treating the patients. The TB coordinator shared knowledge with staff nurses on the treatment process, including determining the appropriate number of tablets for each patient based on weight. The staff nurses' understanding was further enhanced through their own experience, guided by the instructions and supervision of the nurse overseeing the TB program. Knowledge-sharing is relevant to nursing practice (Cordeiro et al., 2024).

Sub-theme 6: Community Mobilization

Public health programs are considered unsuccessful if desired attendees and outcomes are low.

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Limited Community Involvement. There is a need for community participation, and they should develop an interest in health education, as identified by the participants.

Participant 1 stated, *"I did not attend the TBMS. I was at work during that time."*

Participant 2 stated, *"Neighbors are too lazy to attend. They say they are doing house chores and do not want to attend the TBMS."*

Participant 3 stated, *"Some just do not care about the importance of the TB case-finding program; they do not attend TBMS or barangay meetings that concern health."*

Participant 4 stated, *"TB case finding is important. I might get infected again unexpectedly even though I am on guard of my health, so the RHU should educate and reorient the community continuously. Many are still not bothered by not attending that TB Mass Screening."*

Participant 5 stated, *"I think many will attend barangay meetings if you say they will receive something, like relief goods or money or medicines like vitamins. Everyone has different reasons for not attending community health education or TBMS."*

Participant 6 stated, *"They just do not attend community health assemblies. Maybe they think they are just for sick people, and they pretend that they know it all already."*

Participant 7 stated, *"Very few attended announced TBMS."*

The participants' result implies minimal community involvement in community health education efforts. Multiple barriers have been identified, such as scheduling conflicts, lack of motivation or interest in the program, low health awareness, incentive-driven participation, and misconceptions, which make the overall turnout poor. Everyone has his own role in maintaining a healthy community. Social participation, adaptation to crisis, and care for others are important to health, as they contribute to supportive environments and shared responsibility for the overall well-being of an individual and the community (Opata, 2024).

Limited Community Engagement. Many factors contribute to limited community engagement. The root cause of not attending health activities must be addressed appropriately.

Health worker 1 stated, *"Not everyone attends TB awareness and case-finding of the RHU."*

Health worker 4 stated, *"From my experience when I discussed TB Health Education, not all 4ps Members attended the scheduled TB Health Education and even TBMS."*

Health worker 5 stated, *"TB health education should be interactive. Some audiences are not listening. Some listen for a while and then leave."*

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Health worker 6 stated, "*There was a payout for senior citizens during my barangay visit and scheduled TB Health Education. I let the BHW invite them for a short discussion, and only a few attended,"*

Health worker 7 stated, *"FDS are only intended for 4ps members and are required to attend. How about those private individuals who also need proper TB health education? We cannot force those individuals to attend FDS; as we have experienced, they do not attend even though they were invited."*

The result from the health workers' responses implies that TB awareness programs and health education sessions are not reaching the entire target. Health education programs like FDS (Family Development Sessions) are limited to 4ps members, excluding other vulnerable groups. There is a lack of perceived importance of TB education. By emphasizing early intervention and health education, future health programs can lessen the prevalence of chronic diseases and reduce the overall burden and cost on healthcare systems (Akbar & Abbas, 2025; Autoimmunity – Legend Innovation Life Science Fund, n.d.).

Theme 2: Prospects

The participants and health workers identified best practices and potential opportunities for tuberculosis management.

Sub-theme 1: Health facilities

Improved Infection Control Measures. The enhanced practices and protocols on RHU and Department of Health standards have improved infection prevention.

Participant 1 stated, *"I was interviewed, health educated, and started medication in a private room. There is a no facemask, no entry policy."*

Participant 2 stated, *"I was advised to cover my mouth when coughing or stay away from others to limit saliva spread. I should also carry my tissue and plastic and dispose of them properly."*

Participant 3 stated, *"I was given a facemask before I entered the RHU. There is a designated area for sputum collection and an isolated waiting area."*

Participant 5 stated, *"I waited for my consultation in a shaded area away from other regular patients."*

All Health workers stated, *"No facemask, no entry policy in the health facility."*

Health worker 1 stated, *"Patients were instructed to bring their water bottles on the day of starting medication. The patient has a waiting area and will be allowed to enter the treatment room when called."*

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Health worker 4 stated, *"Sputum may be collected from patients. They were instructed to breathe deeply and expectorate a phlegm-like substance, not just saliva from the mouth. They are brought to the back of the office, which is the sputum collection area."*

The result on health workers and participants statements implies that Rural Health Unit health practices, in line with Department of Health (DOH) standards, have created a safer, more controlled healthcare environment, reducing the risk of infection, and creating a culture of health responsibility among patients and staff alike. There is improved infection control through protocol and policies implementation. Patients were oriented and educated about infection and control practices and policies. Preventive strategies that are safe and standardized clinical procedures aligned with DOH guidelines are essential in managing diseases like Tuberculosis. They not only protect individual health but also reduce the charges on the health care system and contribute to improved overall public health outcomes (Chavis & Ganesh, 2019).

Sub-theme 2: Health information system

Barangay health workers have played a significant role in verifying the data provided by patients at the Rural Health Unit (RHU).

Remote Monitoring. Due to the limited availability of gadgets such as mobile phones and computers, the barangay health workers serve as the monitoring system. The BHWs' mobile phones also serve as the contact number for some of the patients in the barangay.

Participant 1 stated, *"The BHW visited here and verified the location of my eldest son because I did not declare him in the contact tracing."*

Participant 2 stated, *"The BHW informed me that I need to take my 4-year-old child to the RHU for assessment and medication via phone call."*

Participant 5 stated, "*I remembered that I was home visited by a nurse and BHW and was asked if all of my family members had already been to the x-ray laboratory."*

Participant 8 stated, *"BHW visited me in the house to check if I had already taken the medicine."*

Health workers 1 and 5 stated, *"I sometimes visit the patients' homes with the BHW to verify their status and check all the family members to see if they have already been to the X-ray laboratory."*

Health worker 7 stated, *"There was a time when I asked the BHW to follow up and trace the location of a patient."*

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Health worker 4 stated, *"I instructed the midwife or nurse who handled that barangay to tell their BHWs to check the patients to see if they are taking their medicines daily at the right time."*

Health worker 6 stated, "*I contacted my BHW to verify and follow up on why the patient is still not going to the RHU for the start of medication."*

Both respondents' results imply that with limited digital access, Barangay Health Workers are a vital link between the rural health facility and the barangay, performing roles in patient monitoring, contact tracing, and treatment adherence. The dedication of barangay health workers to supervising the treatment of patients who could not visit the DOTS facility in the RHU daily has helped make TB care more accessible and patient-centered (Querri et al., 2017). Health workers frequently delegate monitoring and verification tasks to BHWs, often out of necessity rather than efficiency.

Sub-theme 3: Health education

Health education is a vital guide for individuals, providing accurate information and supporting informed decision-making regarding their health and well-being.

Community-based Health Education. Health assemblies always discuss topics like Tuberculosis, dengue, leptospirosis, and other health issues.

Participant 1 stated, *"The store owner in front of the barangay gym told me the barangay's upcoming and ongoing activities when I asked why so many people were gathering. Health education conducted by the RHU with the Sanitation office is most common."*

Participant 5 stated, *"The MSWD Team Leader informed us back then that there will be a discussion of TB at the FDS meeting. Attendance is a must."*

Participant 8 stated, "*My daughter is a BHW, and she informed me about the TB Mass Screening and barangay health education."*

Participant 9 stated, *"I heard the BHW announcing that there will be a TB Mass Screening while she was talking to my wife."*

Health workers 1, 2, 3, 4, and 7 stated, "I *have conducted TB Health Education in FDS meetings."*

The result in the participants responses implies that several health education participants learned about health activities through word of mouth. The responses also indicate that informal communication is an effective channel for disseminating health information within the community. The facilitation of health workers on community health education is taking place through Family Development sessions and barangay assemblies. The reach and effectiveness of the program are

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often dependent on the personal networks or persons who know the program. Mandatory attendance also has an impact on the effectiveness of the activity. Recognizing the importance of family, which is the foundational unit of any community, support and involvement by the family can strongly help individuals undergoing tuberculosis treatment regimen, contributing to better recovery rates and overall community health (Lutfian et al., 2024).

Sub-theme 4: Resources

If any primary and essential resources are missing to deliver effective healthcare services, it can disrupt the entire process.

Improved Access to Essential Medication. The National Tuberculosis Program provides essential medicines for Tuberculosis.

All Participants stated, *"Yes, there is complete medicine."*

Participant 5 stated, *"There was a time when I was leaving the town for a family visit in Isabela. The nurse gave me the medicine in advance, and I was instructed to return and continue taking my medication here in our town."*

Participant 8 stated, "*The BHW can retrieve my medicines in the RHU and deliver them to my house."*

All Health workers stated, *"We have sufficient medicines as of now."*

Both respondents' results imply that improved access to essential TB medications through the National Tuberculosis Program of DOH has significantly enhanced treatment continuity and patient adherence. Knowing that medicines are consistently available and accessible builds trust in the public health system. Participants were diagnosed with drug-susceptible Tuberculosis (TB), which allowed them to access free TB services at the Rural Health Unit (RHU), which increased their likelihood of completing treatment and being cured (Florentino et al., 2022).

Sub-theme 5: Knowledge

Most participants have informed knowledge and have encountered health education at the barangay level or in one-on-one health education in the Rural Health Unit.

Expanded TB Health Education. TB health education has reached every barangay with various communication methods and visual aids.

All Participants stated, *"Health education was discussed during the start of treatment at the RHU."*

Participant 5 stated, "*The MSWD Team Leader informed us back then that there would be a discussion of TB at the FDS meeting. Attendance is a must."*

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Participant 8 stated, *"I have attended FDS meetings that discussed TB."*

Participant 9 stated, *"My wife shared information from the FDS meeting she attended. I remembered what she said when I was health educated at the RHU."*

All Health workers stated, *"I have assessed, interviewed, and educated clients in the TB Mass Screenings."*

Health workers 1, 2, 3, and 5 stated, *"I have conducted TB Health Education in FDS meetings."*

Health workers 3, 4, and 7 stated, *"I did one-on-one TB health education before starting patients' medication."*

The collective statements of the respondents, both patients and healthcare workers, imply that TB health education efforts are widespread and employ a mix of group sessions, one-on-one discussions, and integration into existing community programs like FDS. TB knowledge is sometimes transferred informally through family members, which shows a social ripple effect. Attendance requirements help but may exclude non-4ps individuals. TB mass screening activities serve to find TB cases and provide public education and awareness. The Rural Health Unit, in collaboration with the municipal Department of Social Welfare and Development, conducts health education in scheduled Family Development Session (FDS) (FDS | Pantawid Pamilyang Pilipino Program, n.d.).

Integration of Digital Learning. Nurses identified access to online educational learning.

Health workers 1,2,3,4,5,6, and 7 stated, *"I have attended e-learning online the Tuberculosis Manual of Procedures 6th Edition of the DOH Academy."*

Health worker 4 stated, *"I have online webinars and updates from DOH and WHO."*

The statements from the respondents (Health workers 1-7) imply their engagement with online educational platforms and resources related to TB education and updates. An online learning course on Tuberculosis at https://learn.doh.gov.ph/ was associated with improving nurses' knowledge, reflected in their understanding of TB and its application in their daily clinical functions (Cabral et al., 2017).

Sub-Theme 6: Community Mobilization

Bringing free services to the barangay will improve access to healthcare and reduce financial constraints. Transportation support will encourage people to seek early diagnosis and treatment and promote community well-being.

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Strong Partnership with Other Organizations. The partnership of the RHU and other organizations has been simultaneously reaching barangays more effectively, reducing duplication of efforts, and ensuring a unified and sustainable response to Tuberculosis.

All Participants stated, *"TB Mass Screening in the barangay."*

Participant 6 stated, *"The OLSHCO Alumni group has been conducting a free medical mission here for the past three years. There were free medicines for cough, hypertension, and vitamins."*

All Health workers identified and stated, *"TB Mass Screening of Alay-Buhay and PBSP."*

The statements from Health workers and Participants imply a strong multi-sectoral collaboration between the RHU (Rural Health Unit), non-government organizations, and private groups in implementing community-wide TB initiatives—outreach programs where implemented, including TB mass screenings. The Philippine Business for Social Progress (PBSP) is instrumental in combating Tuberculosis (TB) in the municipality of Guimba by providing free mobile X-ray services in all of the barangays through Advancing Client-centered Care and Expanding Sustainable Services for TB (ACCESS TB) (PBSP v2.2, n.d.).

Proposed Intervention Program to Minimize Challenges in TB Case finding

Key Concept	Objectives	Activities	Budget Allocation	Time Frame	Expected Results
Facilities	Transport of financially constraint patients to RHU or hospital	Transportation assistance	Barangay budget allocation on gasoline	Daily use upon request	Delivered patient for timely diagnosis and treatment care.
	Acquisition of LGU-owned mobile x-ray or request from DOH	Frequent schedules of barangay TB Mass Screening	LGU budget of 5 million	Acquisition after budget approval to be used on scheduled basis on all barangays	Increased daily output of TB screened and assessed patients
Health information system	Integration of health education via digital learning	Community health education in aid of digital tools to enhance learning	Digital equipment like television or projectors provided by the LGU costing P200,000	Purchasing done as soon as possible and will be used daily or weekly depending on Health education schedules	Improved TB health awareness and orientation of digital health.

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	Improvement of RHU information health system	Update or purchase of computers and implementation use of DOH Iclinicsys.	P500,000	Purchasing or updating computer system as soon as possible and to be used daily	Electronic health record use in all patient care not just for TB but for all medical cases for ease of recording
Health education	Enhancement of TB health education	Conduct of community assembly and purok classes to orient community people about the programs in TB care	LGU allocation on transportation of staff and equipments. Foods and drinks courtesy of the Barangay.	Done monthly on at least 1 to 2 brgys./RHU to cover all 64 brgys.	Improved community people involvement and interest in community health assemblies. Improved TB health awareness and correct misconceptions
	Posting of TB Tarpaulins and Posters	Posting of educational TB materials in key areas like the barangay hall, churches, schools, market and other common areas in town and barangays	P100,000	Posting may be done any time when supplies are available	Provided TB health information and be familiarized and remember key information
	Improvement of time allotment for patient education	Assign nurses that will only facilitate and assist TB patients	LGU hired staff Or create new item for TB nurse. Allocation of staff salary	Upon the approval of designation, shall start as soon as possible	Improved health care and service for TB patients. More time to educate.
	Providing government financial assistance	Enrollment to Conditional Cash Transfer Program (CCT)/4Ps Program	DSWD budget	Apply the individuals and it will depend on the assessment and approval of the local DSWD.	Improved financial status and living condition.
	Provide economic help	Pooling of jobs and referral with LGU or barangay efforts	No budget allocation	Done daily if jobs are available for referral	Allocated jobs for financially constraint individuals.

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	Improving Supply chain issues	Advanced notification of supply inventories and requests	Depending on LGU budget per supply and DOH per supply allocation	Done daily and consolidated weekly or monthly	Improved or limited the delays of health supply deliveries.
Knowledge	Training for improvement and uniformed trainings of staffs and nurses	TB coordinator facilitates and conducts complete training in assessment, diagnosing, treatment and recording for all staff. Includes also the proper use of ITIS	No allocation	To be done as soon as possible and may be assessed monthly or quarterly for improvement of TB case finding.	Improved outcomes of TB case finding. More competent healthcare workers
Community mobilization	Frequency of community health education activities and establishment of advanced schedules from NGOs	Frequently conducting of community assembly and purok classes to orient community people about the programs in TB care.	LGU allocation on transportation of staff and equipments. Foods and drinks courtesy of the Barangay	Done monthly on at least 1 to 2 brgys./RHU to cover all 64 brgys.	Improved level of TB health awareness and improved turnout of TB mass screened patient.

Table 2: Proposed Intervention Programs to Minimize Challenges in TB Case finding

IV. Conclusion

The profile of the respondents in this study reflects the underlying challenges in TB case finding, particularly in rural areas. Most were middle-aged, married males with low educational attainment, earning below-average incomes, and living far from health centers are factors that contribute significantly to delayed diagnosis and poor treatment adherence. Their limited health literacy financial constraints, and paired with their isolation, make them less likely to access timely TB services. There is a need for targeted interventions like mobile X-rays and transportation support. On the other hand, public health nurses—primarily young, married females with several years of experience—serve as key front liners but are often overburdened, limiting their ability to deliver in-depth patient education. The respondents urgently need a more accessible, well-resourced, and community-based TB program that considers patient vulnerability and healthcare worker capacity. Anyone and everyone can get infected with tuberculosis, regardless of age, gender, level of education, or employment status. It does not discriminate and can be contacted by people from all walks of life.

The study concludes that despite the challenges in accessing and delivering TB health services in rural and isolated areas, existing practices offer a solid foundation for improvement.

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Accessibility, community engagement, and health resource availability are consistent in the earlier studies about TB case finding. The Barangay Health Workers are connecting rural populations and the formal health system. Integrating digital tools and community-based education aligns with the use of modern technology to strengthen health systems, which can improve TB outcomes when properly implemented. There should be well-established community-based care, stable resource access, and improved coordination with the multisectoral groups.

In conclusion, the proposed intervention offers a practical and community-centered approach. Strengthening TB control in rural areas and addressing issues such as limited access to care, limited health education, and limited resources by decentralizing TB services and bringing them closer to underserved populations should be improved. Like successful models in other low-resource settings, the focus on mobile diagnostics, digital health tools, and strong community partnerships is critical for improving early detection and treatment outcomes. Prioritizing health worker training and consistent community engagement also reflects global best practices in integrated TB programs. The proposed intervention can help rural TB care and move closer to a more efficient, patient-centered health system with sustained support and proper implementation.

V. Recommendations

Given the challenges reflected in the respondents' profiles, several grounded and practical recommendations emerge. First, rural TB programs must prioritize bringing services closer to the people—mobile X-ray vans, transport allowances, and satellite screening events in remote barangays can go a long way in reaching those who otherwise will not seek care due to distance and cost. Second, TB education campaigns should be simplified and localized, using visual materials or community-based learning sessions in dialects people understand. It is not enough to hand out leaflets in barangay assemblies, church groups, and even market days that can be used to reach people where they are. Third, support for public health nurses must go beyond hiring more staff. It should include regular training, mental health support, and better workload distribution, perhaps by tapping more into well-trained Barangay Health Workers who can help with patient education and follow-ups. Lastly, inter-agency partnerships with NGOs should be strengthened to ensure funding flows into facilities, community-based activities, and patient support systems. These steps treat TB and help rebuild trust, boost health-seeking behavior, and create a more patient-centered system that works even in the hardest-to-reach areas.

Any response to TB in rural areas must stay grounded in the daily realities of patients and health workers. This means bringing services closer to the people who need them most—through mobile clinics, transportation support, and consistent barangay outreach. Barangay Health Workers, who already trust their communities, should be given more training and support to expand their role in TB case finding and follow-up. Digital tools like electronic health records and educational videos can help, but only if staff are trained to use them and the infrastructure is in place. It is also time for stronger coordination between local governments, health units, and

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national programs to ensure resources get where they are needed. Most importantly, any intervention should always include the voices of the community. It is the only way to build a TB response that works for the people it serves.

Given the findings and the practical design of the proposed intervention, several key recommendations can be made moving forward. First, local governments and health agencies should prioritize funding and fast-track the rollout of mobile diagnostic services and transportation support, especially for remote barangays. Second, health education must be strengthened by making it regular, relatable, and accessible. Using face-to-face community assemblies and simple digital tools like videos and posters in local dialects. Third, Barangay Health Workers and RHU staff need continuous, practical training on TB protocols and how to engage and educate patients effectively. Fourth, better coordination between the Department of Health, LGUs, and NGOs must be maintained to ensure timely supply deliveries and avoid service disruptions. Finally, digital upgrades like iClinicSys should be fully implemented, and well-oriented technical support should be provided to ensure staff can use the systems efficiently. These actions can make TB care in rural areas more responsive, consistent, and effective if taken seriously.

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