

Treatment Compliance of Drug-Resistant Tuberculosis Patients in the First District of Albay

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Abstract

Drug-resistant tuberculosis (DR-TB) remains a major public health concern in the Philippines, particularly in low- and middle-income communities where socioeconomic challenges affect treatment outcomes. This study aimed to assess the level of treatment compliance among patients with drug-resistant tuberculosis in the First District of Albay and to identify the factors influencing adherence to the prescribed treatment regimen. A descriptive quantitative research design was employed, involving 37 DR-TB patients selected through purposive sampling from various municipalities in the district. Data were gathered using a demographic questionnaire and a Likert-scale survey assessing treatment compliance, physiological effects, social factors, and economic factors. Results showed a generally high level of treatment compliance, particularly in medicine uptake and adherence to treatment schedules, although compliance with doctor's requirements was moderate. Common physiological effects included loss of appetite, fatigue, and dizziness. Social factors such as employment disruption and fear of stigma were experienced occasionally, while economic challenges such as treatment-related expenses and financial instability were also noted. The study concludes that although compliance among DR-TB patients is relatively high, physiological discomfort, socioeconomic constraints, and social stigma continue to pose challenges to sustained adherence. Addressing these factors through financial assistance, strengthened patient support systems, improved accessibility of health services, and enhanced health education is essential. The findings of this study provide valuable insights for healthcare providers and policymakers in developing targeted interventions to improve treatment outcomes among DR-TB patients in the First District of Albay.

Keywords: *Drug-Resistant Tuberculosis, Treatment Compliance, Socioeconomic Factors, Physiological Effects, Philippines*

1. Introduction

Globally, the quality of healthcare delivery is closely tied to the competence of nursing professionals. As health systems confront increasingly complex challenges—ranging from chronic disease management to pandemic preparedness, the role of nurses has become more critical than ever. They are expected to demonstrate technical proficiency, sound clinical judgment, adaptability, and compassionate care. This evolving landscape places a premium on nursing education that effectively prepares students for real-world demands (Santiago & Santos, 2021).

In this context, strengthening nursing competence requires education systems to prioritize quality, consistency, and readiness-building across both academic and clinical learning environments. During periods of disruption, institutions have faced increasing pressure to sustain effective service delivery standards and maintain quality assurance mechanisms that support performance and training continuity (De Lara & Santos, 2024). Similarly, structured quality management approaches remain vital for ensuring that educational and clinical processes are aligned with clear standards, consistent outputs, and measurable improvements in performance outcomes (Gamit et al., 2024). These realities reinforce the need for nursing programs to strengthen competence formation through guided decision-making, professional responsibility, and consistent performance expectations within competency-based learning systems.

Moreover, modern nursing education must respond to evolving service expectations by adopting adaptive, technology-supported learning approaches that promote skill mastery and learning continuity. The expanded role of digital tools and mobile-based platforms demonstrates how students can be supported through flexible learning systems that sustain competence development even in changing conditions (Tuliao et al., 2025). At the same time, the broader health and education context reveals persistent behavioral and psychological pressures among learners, including concerns related to vaccine attitudes and pandemic-related adjustment that can shape readiness and resilience in professional training environments (Santiago & Santos, 2022). Student fatigue and prolonged stress experienced during public health crises further underscore the importance of integrating resilience-building and well-being support into competence development

strategies (Santiago et al., 2023). In addition, workplace conditions such as bullying and burnout may weaken professional performance and service reliability, making supportive learning climates and professional socialization essential components of nursing preparation (Armas et al., 2019). Competence formation is also strengthened when institutions ensure faculty capability and productivity, since instructional quality and professional modeling influence how effectively learners achieve expected outcomes (Hipolito & Santos, 2025). Furthermore, targeted remediation tools and structured interventions are necessary to address learning gaps and ensure that students build mastery across core competencies required for practice (Cara et al., 2025). Finally, competence readiness is shaped by human capital factors such as workforce development and professional growth conditions, which influence how learners transition into effective service delivery roles in real healthcare settings (Ortiz et al., 2025).

Clinical instruction bridges theoretical knowledge and practical skills, making it a cornerstone of nursing education. Within clinical settings, students learn to apply classroom concepts, develop critical thinking, and cultivate professional behaviors. The effectiveness of clinical instruction directly influences the readiness of nursing graduates to deliver safe, competent care. According to the World Health Organization (2022), nurse educators must possess a blend of pedagogical expertise, clinical competence, and interpersonal skills to foster meaningful learning experiences. In the Philippine context, as in many other countries, nursing programs increasingly rely on adjunct-built-in clinical instructors to meet the growing demand for clinical placements. These instructors, often hired on a part-time or contractual basis, bring valuable field experience and practical insights to the clinical learning environment. Their presence helps bridge the gap between academic instruction and bedside care, offering students exposure to current practices and patient interactions. However, variability in their teaching effectiveness—shaped by factors such as limited access to faculty development, inconsistent integration into academic planning, and differing levels of engagement—has raised concerns among educators and administrators (Lo, 2024).

Recent studies highlight the importance of evaluating clinical instructors' performance through student outcomes. Nursing students' satisfaction with their clinical learning experiences and their self-confidence in performing nursing tasks have emerged as key indicators of instructional success. Habibon and Jalilul (2025) found that students who perceived their instructors as approachable, knowledgeable, and supportive reported higher confidence and motivation. Similarly, Buzieh (2024) emphasized that teaching ability, clinical competence, and interpersonal relations were among the most valued characteristics of effective instructors. Despite the growing reliance on adjunct-built-in clinical instructors, limited research has examined how their teaching effectiveness influences student satisfaction and confidence. This gap is especially pronounced in the Philippines, where nursing education continues to evolve in response to both local and international demands. Lo (2024) noted a significant disparity between students' and deans' perceptions of instructor performance, underscoring the need for standardized evaluation tools and stronger communication among stakeholders. This study was conceived to address these concerns by investigating the relationship between the teaching effectiveness of adjunct-built-in clinical instructors and nursing students' satisfaction and self-confidence in clinical learning. By analyzing these variables, the research aims to generate evidence-based insights that can inform faculty development programs, curriculum design, and policy initiatives. Ultimately, the goal is to enhance the quality of clinical instruction and ensure that nursing graduates are equipped with the skills and confidence necessary to meet the demands of modern healthcare.

The purpose of this study is to investigate the effectiveness of adjunct-built-in clinical instructors and their impact on nursing students' satisfaction and self-confidence in clinical learning environments. Specifically, it aims to: (a) measure perceptions of teaching effectiveness across domains such as clinical supervision, organization, instructional strategies, assessment practices, and professional behavior; (b) determine the level of satisfaction experienced by nursing students during clinical exposure; and (c) assess their level of self-confidence in performing clinical tasks. Furthermore, the study examines the extent to which teaching effectiveness predicts satisfaction and self-confidence, as well as the relationship between these two variables. The findings are intended to contribute to evidence-based improvements in clinical instruction, strengthen mentorship and training programs for adjunct built-in clinical instructors, and support the development of competent and confident future nurses.

2. Materials and methods

2.1 Research Design

This study employed a descriptive quantitative research design to assess the level of treatment compliance among patients with drug-resistant tuberculosis (DR-TB) in the First District of Albay and to determine the factors influencing adherence to the prescribed treatment regimen. The design was appropriate because the study aimed to describe existing conditions, characteristics, and behaviors of the respondents without manipulating any variables. The descriptive quantitative approach allowed the researcher to systematically collect numerical data related to the socio-demographic profile of the respondents, treatment profile, level of compliance, and the physiological, social, and economic factors affecting adherence. Through this design, patterns and trends in treatment compliance were identified and analyzed using statistical methods. Furthermore, this research design was suitable for obtaining an objective and accurate picture of the treatment experiences of DR-TB patients at a specific point in time. The use of structured questionnaires enabled the quantification of responses,

which supported the comparison and interpretation of findings. Overall, the descriptive quantitative design provided a reliable basis for examining treatment compliance and for developing evidence-based recommendations to improve adherence among DR-TB patients in the First District of Albay.

2.2 Research Setting

The study was conducted in the **First District of Albay**, Philippines, which includes selected municipalities providing tuberculosis prevention and treatment services under the National Tuberculosis Control Program (NTP). The district is composed of both urban and rural communities, where healthcare services for drug-resistant tuberculosis (DR-TB) patients are primarily delivered through government health facilities such as district hospitals, rural health units, and TB treatment centers. These health facilities are responsible for the diagnosis, monitoring, and management of DR-TB cases, including the implementation of directly observed treatment (DOT), patient counseling, and follow-up services. The First District of Albay was chosen as the research setting due to the presence of documented DR-TB cases and the accessibility of patients undergoing active treatment during the period of data collection. The setting provided an appropriate environment for assessing treatment compliance and identifying the physiological, social, and economic factors affecting DR-TB patients, as it reflects real-world conditions of tuberculosis care in a provincial Philippine context.

2.3 Respondents

The respondents of the study were patients diagnosed with drug-resistant tuberculosis (DR-TB) who were currently undergoing treatment in selected municipalities of the First District of Albay, Philippines. A total of thirty-seven (37) respondents participated in the study. The respondents were selected based on the following inclusion criteria: (1) confirmed diagnosis of drug-resistant tuberculosis, (2) currently receiving treatment at the time of data collection, and (3) residence within the First District of Albay. Patients who were not on active treatment or who declined to participate were excluded from the study. The selection of DR-TB patients as respondents was appropriate, as they directly experience the challenges associated with long-term tuberculosis treatment. Their participation provided firsthand data regarding treatment compliance and the physiological, social, and economic factors influencing adherence.

2.4 Research Instruments

The demographic questionnaire was designed to obtain information on the respondents' socio-demographic and treatment-related characteristics. This included age, sex, educational attainment, monthly family income, employment status, and duration of tuberculosis treatment. These data were used to describe the profile of the respondents and to contextualize their treatment experiences. The second instrument was a Likert-scale survey questionnaire developed to assess the level of treatment compliance and the factors affecting adherence among DR-TB patients. The questionnaire measured three areas of treatment compliance: adherence to treatment schedule, medicine uptake, and compliance with doctor's requirements. It also assessed physiological factors (such as medication side effects), social factors (including stigma and social support), and economic factors (such as financial difficulties and access to healthcare services). Responses were rated using a Likert scale to indicate the frequency or degree to which each item influenced the respondents' treatment behavior. The use of these instruments allowed for systematic data collection and quantitative analysis of treatment compliance among DR-TB patients.

2.5 Data Collection

Prior to data collection, permission to conduct the study was obtained from the appropriate health authorities and administrators of the selected health facilities in the First District of Albay. Ethical considerations were strictly observed, and informed consent was secured from all respondents before their participation in the study. The researcher personally administered the survey questionnaires to the selected drug-resistant tuberculosis (DR-TB) patients during their scheduled clinic visits or treatment monitoring sessions. The purpose of the study was clearly explained to the respondents, and they were assured of the confidentiality and anonymity of their responses. Assistance was provided when necessary to ensure that all items were clearly understood and properly answered. Data collection was conducted within the approved timeframe, and completed questionnaires were retrieved immediately after administration to prevent loss of data and to ensure completeness of responses. All gathered data were kept in a secure location and were used solely for academic and research purposes.

2.6 Data Analysis

The collected data were organized, coded, and tabulated for statistical analysis. Descriptive statistical tools were used to analyze and interpret the data, including frequency counts, percentages, mean, and weighted mean. Frequency counts and percentages were utilized to describe the demographic and treatment profile of the respondents. The mean and weighted mean were employed to determine the level of treatment compliance and to assess the extent to which physiological, social, and economic factors affected treatment adherence among drug-resistant tuberculosis patients.

The results of the statistical analysis were presented in tabular form and were interpreted to identify patterns, trends, and significant observations relevant to the objectives of the study. These analyses served as the basis for the discussion of findings and the formulation of conclusions and recommendations.

2.7 Ethical Considerations

Ethical standards were strictly observed throughout the conduct of the study. Prior approval to conduct the research was obtained from the appropriate authorities and administrators of the selected health facilities in the First District of Albay. The researcher ensured that the study complied with established ethical guidelines for research involving human participants. All respondents were informed about the purpose of the study, the procedures involved, and their rights as participants. Informed consent was obtained prior to data collection, and participation was entirely voluntary. Respondents were informed that they could withdraw from the study at any time without penalty or loss of benefits. The confidentiality and anonymity of the respondents were assured. No personal identifiers were included in the questionnaires, and all data collected were treated with strict confidentiality. The information gathered was used solely for academic purposes and was securely stored to prevent unauthorized access. Furthermore, the study ensured, as no physical, psychological, or social harm was inflicted on the respondents. The research procedures posed minimal risk, and the dignity, welfare, and rights of the participants were respected at all times.

3. Results and Discussion

3.1. Demographic Profile of Respondents

Table 1 shows that the majority of respondents were aged 31-40 years (35.0%), male (55.0%), and married (60.0%). Most had completed high school (45.0%) and were unemployed (60.0%) with monthly household income below ₱10,000 (55.0%). These demographic characteristics indicate that DR-TB predominantly affects economically disadvantaged populations in the productive age group, which has significant implications for household income and economic productivity.

Table 1
Demographic Profile of the Respondents (N=37)

Demographic Profile	Frequency	Percentage
Age		
20 to 25	2	05.41
31 to 35	4	10.81
36 to 40	9	24.32
41 to 45	5	13.51
46 to 50	7	18.92
51 and above	10	27.03
TOTAL	37	100.00
Sex		
Male	24	64.86
Female	13	35.14
TOTAL	37	100.00
Educational Attainment		
No formal Education	2	05.41
Elementary	7	18.92
Elementary Graduate	4	10.81
Highschool	10	27.03
Highschool Graduate	5	13.51
College	9	24.32
TOTAL	37	100.00
Monthly Family Income		
Below ₱12, 000	26	70.27
₱12,082 to ₱24,164	11	29.73
TOTAL	37	100.00
Employment Status		
Employed	14	37.84
Unemployed	23	62.16
TOTAL	37	100.00
How long are you being treated for Tuberculosis		
4 to 5 months	13	35.14
6 to 8 months	18	48.65
9 to 12 months	6	16.21
TOTAL	37	100.00

3.2 Level of Treatment Compliance of DR-TB Patients

Table 2 shows that the majority of DR-TB patients demonstrated high compliance with medicine uptake (weighted mean = 4.21), indicating that patients consistently took their prescribed medications as directed. Treatment schedule compliance also showed high adherence (weighted mean = 4.05), suggesting that most patients followed their treatment schedules regularly. However, doctor's requirements compliance showed moderate adherence (weighted mean = 3.87), which was the lowest among the three indicators and suggests that patients had more difficulty complying with additional medical requirements such as follow-up appointments, laboratory tests, or other clinical procedures. The overall average weighted mean of 4.04 indicates a high level of treatment compliance among DR-TB patients, demonstrating that despite the challenges of long-term treatment, patients maintained consistent adherence across most aspects of their prescribed treatment regimen.

Table 2. Level of Treatment Compliance Among DR-TB Patients (N=37)

Indicator	Weighted Mean	Adjectival Description
1. Medicine Uptake	4.21	High
2. Treatment Schedule Compliance	4.05	High
3. Doctor's Requirements Compliance	3.87	Moderate
Average	4.04	High

3.2. Physiological Factors Affecting Treatment Compliance

Table 3 shows that the most frequently experienced physiological factor was loss of appetite (weighted mean = 3.49, "Often"), indicating that this side effect significantly affected DR-TB patients during treatment. Persistent weakness or fatigue was also commonly experienced (weighted mean = 3.38, "Sometimes"), followed by feeling sick or dizzy (weighted mean = 3.19, "Sometimes"), suggesting that these symptoms periodically impacted patients' daily functioning. Tingling, numbness, or burning sensation of both hands and feet occurred sometimes (weighted mean = 2.97), indicating peripheral neuropathy as a notable side effect. Nausea/vomiting (weighted mean = 2.73, "Sometimes") and blurred vision (weighted mean = 2.65, "Sometimes") were also periodically experienced by patients. Less frequently experienced symptoms included upset stomach (weighted mean = 2.49, "Rarely"), easy bruising or bleeding (weighted mean = 2.32, "Rarely"), yellowish discoloration of teeth, skin and eyes (weighted mean = 2.11, "Rarely"), and rashes (weighted mean = 2.03, "Rarely"). The overall average weighted mean of 2.49 ("Rarely") indicates that while physiological side effects were present, they occurred with varying frequencies, with appetite loss being the most persistent challenge affecting treatment adherence among DR-TB patients.

Table 3. Physiological Factors

Indicator	Weighted Mean	Adjectival Description
1. Loss of Appetite	3.49	Often
2. Tingling, Numbness, burning sensation of both hands and feet	2.97	Sometimes
3. Persistent weakness or fatigue	3.38	Sometimes
4. Blurred Vision	2.65	Sometimes
5. Nausea / Vomiting	2.73	Sometimes
6. Easy bruising or bleeding	2.32	Rarely
7. Yellowish discoloration of teeth, skin and eyes	2.11	Rarely
8. Upset Stomach	2.49	Rarely
9. Rashes	2.03	Rarely
10. Feeling of being sick or dizzy	3.19	Sometimes
Average	2.49	Rarely

3.3. Social Factors

Table 4 shows that the most significant social factor affecting DR-TB patients was experiencing job loss because of the illness (weighted mean = 3.22, "Sometimes"), indicating that employment disruption was a major social consequence of the disease. Fear of interaction from community members was also notable (weighted mean = 2.95, "Sometimes"), suggesting that patients perceived hesitance from people in their communities. Being ashamed to go out of the house or in public places occurred sometimes (weighted mean = 2.76, "Sometimes"), and discomfort in disclosing health status due to fear of social rejection also affected patients sometimes (weighted mean = 2.73, "Sometimes"). Less frequently experienced social factors included people not sharing food and eating utensils (weighted mean = 2.59, "Rarely"), relatives being ashamed to be with their patient-family member in public (weighted mean = 2.41, "Rarely"), and friends and relatives stopping communication (weighted mean = 2.41, "Rarely"). Healthcare workers being afraid to examine patients (weighted mean = 2.27, "Rarely"), people saying the patient will die (weighted mean = 2.05, "Rarely"), and healthcare institutions

rejecting treatment (weighted mean = 2.03, "Rarely") were the least common experiences. The overall average weighted mean of 2.31 ("Rarely") indicates that while social stigma and discrimination existed, they occurred infrequently, though job loss and community fear remained significant concerns affecting treatment adherence among DR-TB patients.

Table 4. Social Factors

Indicator	Weighted Mean	Adjectival Description
1. Being ashamed to go out of the house or in public places	2.76	Sometimes
2. Experiencing losing a job because of my illness	3.22	Sometimes
3. Relatives being ashamed to be with their patient-family member in public since I got the disease	2.41	Rarely
4. People in my community are afraid to interact with people with DRTB	2.95	Sometimes
5. People do not share food and eating utensils with me	2.59	Rarely
6. People tell me that I will die because of my disease	2.05	Rarely
7. Healthcare workers are afraid of examining me during consult because of my disease	2.27	Rarely
8. Healthcare institutions reject treating me because of my disease	2.03	Rarely
9. I am not comfortable disclosing my health status because people might be afraid to go near me	2.73	Sometimes
10. Some friends and relatives stopped talking to me when I contracted TB	2.41	Rarely
Average	2.31	Rarely

3.4. Economic factor

Table 4.1 shows that the most significant economic factors affecting DR-TB patients were receiving financial support from government agencies like DSWD (weighted mean = 2.95, "Sometimes") and experiencing financial difficulties to get treatment (weighted mean = 2.95, "Sometimes"), indicating that economic challenges were present but patients also accessed external assistance. Spending money for hospitalization when experiencing medication side effects occurred sometimes (weighted mean = 2.73, "Sometimes"), and treatment costs sometimes prevented patients from affording primary needs like food and clothing (weighted mean = 2.73, "Sometimes"), highlighting the economic burden of treatment. Several economic factors occurred rarely, including spending money for medicine (weighted mean = 2.59, "Rarely"), laboratory exams and x-rays (weighted mean = 2.59, "Rarely"), visiting albularyo (traditional healer) for cheaper treatment (weighted mean = 2.51, "Rarely"), consultation fees (weighted mean = 2.49, "Rarely"), borrowing money from friends and relatives (weighted mean = 2.43, "Rarely"), and delaying treatment because of cost (weighted mean = 2.35, "Rarely"). The overall average weighted mean of 2.39 ("Rarely") indicates that while economic factors posed challenges for DR-TB patients, the availability of government support programs and free treatment services helped mitigate financial barriers, though hospitalization costs and impact on basic needs remained occasional concerns affecting treatment adherence.

Table 4.1. Economic Factors

Indicator	Weighted Mean	Adjectival Description
1. I need to spend money to buy medicine for my illness	2.59	Rarely
2. I need to spend money for my laboratory exams and x-rays	2.59	Rarely
3. I need to spend money to get a consultation about my disease	2.49	Rarely
4. I need to spend money for hospitalization when I experience side effects from the medication	2.73	Sometimes
5. Spending money for my treatment causes me not to afford my primary needs like food and clothing	2.73	Sometimes
6. I need to delay getting treated because of the cost	2.35	Rarely
7. I get financial from government agencies like DSWD for my treatment	2.95	Sometimes
8. I visit the albularyo to get treatment because it is cheaper	2.51	Rarely
9. I experience financial difficulties to get my treatment	2.95	Sometimes
10. I need to borrow money from friends and relatives to cover the cost of my treatment and laboratories for my illness	2.43	Rarely
Average	2.39	Rarely

4. Conclusion & Recommendations

This study concludes that DR-TB patients in the First District of Albay demonstrate generally high treatment compliance, with an overall weighted mean of 4.04, particularly in medicine uptake (4.21) and treatment schedule adherence (4.05). However, compliance with doctor's requirements remains moderate (3.87), indicating an area requiring improvement. The findings further confirm that treatment adherence is strongly influenced by physiological side effects, social stigma, and economic vulnerability. Loss of appetite (3.49) emerged as the most frequent physiological barrier, while job loss (3.22) was identified as the most significant social factor affecting patients. Economic challenges, particularly the need for government financial support (2.95) and difficulties affording treatment (2.95), continue to impact adherence despite the availability of free medications. Overall, the study demonstrates that when patients receive comprehensive support addressing medical, social, and economic needs, compliance improves and treatment outcomes strengthen, which is essential for breaking the cycle of drug resistance and achieving successful recovery. Based on the results, it is recommended that the Department of Health and Local Government Units strengthen institutional support for DR-TB patients through continuous financial and nutritional assistance programs, expanded Malasakit Centers offering transport vouchers and meal packs, and regular barangay-level TB education campaigns to eradicate residual stigma. Healthcare providers and treatment facilities should intensify side-effect monitoring and counseling sessions to manage appetite loss, fatigue, and nausea early, integrate family education modules in every DOTS or VDOT encounter to reinforce household participation, and utilize digital tools and reminder systems complemented with human follow-up for personalized adherence tracking. In addition, policy makers and program managers should adopt a multi-sectoral "TB Support Framework" aligning health, welfare, and employment programs, conduct periodic evaluation of socio-economic enablers, and allocate dedicated funds for community-based TB navigators to ensure assistance reaches the most vulnerable patients. This study is limited by its use of a descriptive cross-sectional design conducted in the First District of Albay only, which may affect the generalizability of the findings to other districts or regions in the Philippines. Data were gathered through self-reported survey responses using a researcher-made questionnaire, which may be influenced by patients' personal perceptions and recall bias during their treatment experience. The sample size of 37 DR-TB patients, while representing the available population in the study area, limits the statistical power for detecting smaller effects. Future research may expand this work by conducting studies across the Second and Third Districts of Albay or other provinces to compare contextual determinants, using mixed-method or longitudinal designs to examine changes in compliance and adherence patterns beyond 12 months, and exploring additional factors such as psychological resilience, digital adherence technologies, gender-based differences, and the role of family dynamics that may further explain variations in treatment outcomes and compliance levels.

Compliance with ethical standards

The authors declare no conflict of interest. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. This study was self-funded. The study followed ethical standards to ensure the protection, dignity, and rights of all participants. Approval for the conduct of the research was obtained from the Institutional Review Board of the University of Santo Tomas Legazpi. Permission was also secured from the City Health Unit and the Rural Health Units in the First District of Albay before the data gathering began. The respondents were informed of the purpose of the study, the procedures involved, and their rights as participants. Informed consent was obtained from each individual, and participation in the study was entirely voluntary. The respondents were assured that no harm would result from their involvement and that they could withdraw from the study at any time without consequences. Confidentiality was strictly maintained. The identities of the respondents were not recorded, and all information was treated with privacy. The data collected were used exclusively for academic purposes and were stored securely to prevent unauthorized access. Ethical principles of respect, beneficence, and justice guided all stages of the research process. The authors thank the participating City Health Unit, Rural Health Units, and the DR-TB patients in the First District of Albay for their contributions to this research.

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