JURNAL HASIL PENGABDIAN MASYARAKAT (JURIBMAS)
https://ejurnal.lkpkaryaprima.id/index.php/juribmas
e-ISSN: 2961-7286 | p-ISSN: 2962-3677
Volume 4 No 2 Oktober 2025 | Page : 311-317

Dingsanak Peduli TB: Caregiver Empowerment to Improve Knowledge and Skills in Families of TB Patients

Yulia Yunara[1*], Herawati[2], Lola Illona Elfani Kausar[3], Alfian Nur[4], Yaumil Hafsani Siregar[5]

[1,2,3,4,5]Compartment of Community Health Nursing, School of Nursing, Faculty of Medicine and Health Sciences, Universitas Lambung Mangkurat
Email: [1,*]yuliayunara@ulm.ac.id, [2]herawati@ulm.ac.id, [3]lola.kausar@ulm.ac.id, [4]alfiannur.rn@gmail.com, [5]yaumilhafsani@ulm.ac.id
*Corresponding author Email : yuliayunara@ulm.ac.id

Abstract

Tuberculosis (TB) remains a pressing health concern in Indonesia, with caregivers playing a decisive role in supporting treatment adherence and preventing household transmission. This community engagement project, conducted in Desa Keliling Benteng Ulu, South Kalimantan, sought to empower caregivers through structured educational and skill training using the *Dingsanak Peduli TB* module. Fifteen caregivers of TB patients participated in interactive sessions that combined knowledge transfer, demonstration, and skills practice. Knowledge assessment was performed before and after the intervention using domain-specific questionnaires covering TB transmission, household prevention, treatment adherence, family roles, and recovery support. Results showed a significant increase in mean knowledge scores from 56,7 to 85,3. The most pronounced improvements were observed in household prevention practices and treatment adherence, with caregivers reporting greater self-confidence in their caregiving roles. These findings highlight that structured caregiver empowerment can enhance household capacity in TB care and represent a scalable, community-based strategy to strengthen Indonesia's TB control efforts.

Keywords: Caregiver, Community Engagement, Education, Empowerment, Tuberculosis

1. INTRODUCTION

Tuberculosis (TB) remains one of the world's leading infectious causes of morbidity and mortality, and its impact extends well beyond patients to the families who provide daily care. Tuberculosis remains a major global health threat. In 2023, an estimated 10.8 million people fell ill with TB 134 cases per 100,000 population with the heaviest burden in the WHO South-East Asia, African, and Western Pacific regions; TB caused around 1.25 million deaths that year (World Health Organization, 2024, 2025). Beyond patients, TB imposes substantial strain on families who provide day-to-day care. Quantitative and qualitative studies document significant caregiver burden including reduced quality of life across physical, psychological, social, and environmental domains, alongside stigma and stress (Ghazy et al., 2022).

The complexity of TB management including prolonged treatment regimens, risk of drug resistance, psychosocial stigma, and economic strain often places a disproportionate burden on caregivers who serve as the backbone of home-based care (Nagarajan et al., 2022). Evidence from recent studies highlights that caregiver engagement directly influences treatment adherence, completion, and quality of life, whereas caregiver strain may undermine both patient and household well-being (Alinaitwe et al., 2025; Hammouda et al., 2025). This recognition is central to person- and family-centred care approaches, which advocate for strengthening the capacity of families as active partners in the TB care continuum.

A caregiver empowerment lens reframes the family as an active collaborator, emphasizing skill-building and confidence alongside adherence monitoring. Qualitative studies across high-burden settings illustrate the lived realities of caregiving in TB-affected households. Families frequently face stigma, disrupted income, and emotional strain while trying to manage treatment regimens (Chiang et al., 2023; Mcinziba et al., 2025). Caregivers consistently report unmet needs for information, guidance, and psychosocial support (Hammouda et al., 2025). Integrating empowerment-based training covering treatment literacy, monitoring of adverse events, infection control, nutrition, and basic psychological first aid has the potential to reduce caregiver burden while improving treatment continuity (Mcinziba et al., 2025).

Despite these advances, empowerment remains underdeveloped in TB programming. Most interventions still prioritize adherence supervision over broader skill-building. There is limited evaluation of empowerment outcomes such as caregiver knowledge, self-efficacy, and well-being. Furthermore, the dual challenges of catastrophic household costs and caregiver distress highlight the need for integrated approaches that include economic guidance, psychosocial support, and linkage to social protection schemes (Akalu et al., 2023).

In response, this community engagement aims to address these gaps by equipping caregivers with structured training, psychosocial resources, and navigation skills. The program is designed to enhance treatment literacy, home-based symptom monitoring, infection control, nutrition, and stigma reduction, while also integrating elements of mental health first aid and social protection navigation. The overarching objective is to strengthen caregiver competence and self-efficacy, ultimately improving both patient outcomes and caregiver quality of life (Johnson et al., 2025).

2. RESEARCH METHODOLOGY

This community engagement project employed a participatory action research (PAR) design within the framework of a community-based intervention. The approach was selected to integrate academic expertise with community participation, ensuring that caregivers of tuberculosis (TB) patients were not only recipients of health education but also active partners in the empowerment process. Quantitative data analysis using pre- and post-test scores on TB knowledge were collected using structured questionnaires with 10 questions using Guttman Scale, which consisted 5 domains including transmission of TB, prevention of TB transmission in the household, treatment and medication adherence, role of the family in TB care, and supporting factors for recovery. Data were analyzed descriptively (mean, percentage increase) to measure knowledge gain and skills improvement.

2.1 Sample and Sampling

The intervention was conducted in Desa Keliling Benteng Ulu, Kecamatan Martapura Barat, South Kalimantan, Indonesia. The village comprises approximately 553 households with a total population of 1,662 residents. The study setting is geographically characterized by lowland areas along the Martapura River, with limited accessibility to health facilities. Preliminary assessments conducted in collaboration with the local primary health care center (UPT Puskesmas Martapura Barat) revealed 21 active TB cases in the village (18 adults and 3 children). The primary target group consisted of caregivers/family members of TB patients residing in the village. Caregivers were defined as family members who lived in the same household as a TB patient and assumed direct responsibility for daily care, medication supervision, and psychosocial support. Inclusion criteria were: (1) willingness to participate; (2) being a primary caregiver of a TB patient; and (3) residing in Keliling Benteng Ulu. As the results, 15 active TB cases patients' primary caregiver was involved as samples.

2.2 Implementation Phase

a. Preparation Phase
   1) Administrative procedures: obtaining permits, ethical approval, and local authorization.
   2) Coordination: meetings with village authorities, health workers, and community leaders to plan the intervention.
   3) Tool development: preparation of pre- and post-test questionnaires to assess knowledge, and development of a structured training module *Dingsanak Peduli TB*.

e-ISSN: 2961-7286 | p-ISSN: 2962-3677
Volume 4 No 2 Oktober 2025 | Page : 311-317

b. Implementation Phase

The intervention was delivered through interactive education and training sessions. Key activities included:

1) Opening session: orientation, participant introductions, discussion of objectives, and rapport building.
2) Baseline assessment: administration of a pre-test questionnaire to evaluate caregivers' baseline knowledge about TB transmission, treatment, and caregiving practices.
3) Educational sessions: delivery of structured psychoeducation on TB disease, infection prevention, and caregiving responsibilities using lecture, discussion, and visual media.
4) Skills training: hands-on practice sessions covering medication supervision (directly observed therapy), infection prevention behaviors (cough etiquette, sputum disposal), and caregiver self-efficacy building. The *Dingsanak Peduli TB* training module guided these sessions.
5) Post-test evaluation: re-administration of the knowledge questionnaire to measure immediate learning outcomes.
6) Motivational reinforcement: group discussions, sharing of experiences, and recognition of participants' contributions.

c. Evaluation Phase

Evaluation incorporated both quantitative and qualitative measures:

1) Knowledge improvement was assessed by comparing pre- and post-test scores.
2) Affective outcomes (e.g., confidence, motivation, satisfaction) were assessed through short reflective interviews and feedback discussions.

3. RESULTS AND DISCUSSION

A total of 15 caregiver participants of tuberculosis patients from Desa Keliling Benteng Ulu completed the community engagement program and were included in the analysis. All participants attended both the educational sessions and the skill training using the *Dingsanak Peduli TB* module.

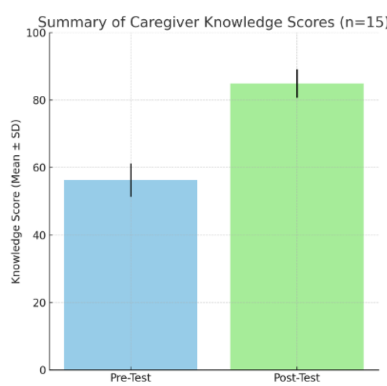

Figure 1. Knowledge score

Baseline assessment through the pre-test revealed that caregivers had limited knowledge about TB disease, treatment adherence, infection prevention, and caregiving practices. The mean pre-test score was 56.7 ± 8.9 (out of 100), indicating moderate but insufficient understanding of TB management. Following the intervention, post-test scores demonstrated a marked improvement in knowledge across all domains. The mean post-test score increased to 85.3 ± 6.4, reflecting a significant gain in comprehension of TB-related caregiving practices. The average knowledge increase was 28.6 points (95% CI: 22.4–34.7).

JURNAL HASIL PENGABDIAN MASYARAKAT (JURIBMAS)
https://ejurnal.lkpkaryaprima.id/index.php/juribmas
e-ISSN: 2961-7286 | p-ISSN: 2962-3677
Volume 4 No 2 Oktober 2025 | Page : 311-317

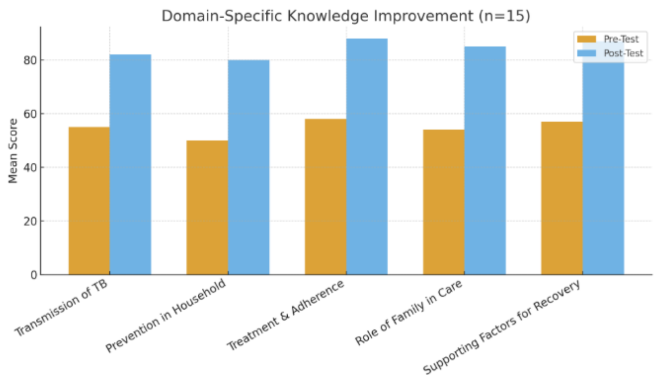

Figure 2. Knowledge domains score

Analysis of caregiver knowledge across five domains revealed consistent and substantial improvements following the intervention. 1) Transmission of TB: At baseline, caregivers demonstrated only a moderate understanding of how TB spreads (mean = 55). After the intervention, the mean score rose to 82, indicating a much clearer comprehension of airborne transmission routes and the importance of early detection. 2) Prevention of TB Transmission in the Household: This domain initially reflected the lowest baseline knowledge (mean = 50), as many caregivers were unaware of effective infection prevention strategies at home. Post-test scores increased to 80, showing significant gains in the ability to apply measures such as proper ventilation, use of masks, and safe sputum disposal.

Meanwhile, 3) Treatment and Medication Adherence: Prior to the program, caregivers scored an average of 58, reflecting uncertainty about drug regimens and adherence importance. Post-test scores reached 88, the highest among all domains, suggesting that the training effectively reinforced the critical role of strict adherence to anti-TB treatment. 4) Role of the Family in TB Care: Caregivers' initial knowledge on their active role in supporting TB patients was limited (mean = 54). This increased to 85 after the intervention, highlighting improved awareness of family involvement in emotional support, treatment supervision, and reducing stigma. 5) Supporting Factors for Recovery: With a baseline mean of 57, caregivers were moderately aware of nutritional, psychosocial, and environmental factors that aid TB recovery. Post-test knowledge rose to 87, reflecting enhanced competence in recognizing and applying supportive strategies. Overall, the greatest improvements were observed in treatment and medication adherence (+30 points) and household prevention practices (+30 points), which were also the most critical gaps identified at baseline. These results indicate that the intervention was highly effective in addressing priority knowledge deficits while strengthening caregivers' holistic role in TB care.

(a) **(b)**

Figure 3. Samples (a) and educational & skill training sessions (b)

JURNAL HASIL PENGABDIAN MASYARAKAT (JURIBMAS)
https://ejurnal.lkpkaryaprima.id/index.php/juribmas
e-ISSN: 2961-7286 | p-ISSN: 2962-3677
Volume 4 No 2 Oktober 2025 | Page : 311-317

Feedback from caregivers reinforced the quantitative findings. Participants reported that prior to the training they were often uncertain about the correct ways to supervise medication, manage sputum, or practice cough etiquette. After the sessions, caregivers expressed greater confidence and clarity in performing these responsibilities. Many also emphasized that the interactive demonstrations and discussions allowed them to better understand and retain the information compared to routine health talks.

Our finding that caregivers' understanding of medication regimens and the importance of adherence increased markedly is consistent with studies showing that family support and treatment education mediate adherence and improve clinical outcomes. Educational interventions that combine factual content with hands-on demonstrations and adherence problem-solving strengthen caregivers' capacity to supervise medication and to detect and respond to adverse effects mechanisms that plausibly contributed to the large post-test gains in this domain (Mohammed et al., 2020). These observations are consonant with recent analyses that highlight treatment education as a key mediator between social support and adherence in TB programs (Cocozza et al., 2020).

The notable improvements in household prevention practices (ventilation, cough etiquette, safe sputum handling) indicate the value of operationalizing infection prevention measures at the household level. Programmatic reviews of community-based TB care emphasize that reducing transmission at home requires not only knowledge but also feasible, context-appropriate practices and reinforcement by local health workers or peer cadres an approach embedded in our Dingsanak Peduli TB model (Sandoval et al., 2023). These outcomes also suggest that caregivers respond well to pragmatic demonstrations which translate abstract infection-control messages into doable household routines (Wademan et al., 2022).

Beyond technical skills, the intervention strengthened caregivers' awareness of their broader role in TB care (emotional support, stigma reduction, linkage to services) and in recognizing supporting factors for recovery (nutrition, rest, mental well-being). This holistic empowerment echoes person-centred TB strategies promoted in recent guidance and literature that integrate psychosocial support and stigma mitigation into routine TB services (Johnson et al., 2025; Kurbaniyazova et al., 2023). Co-designed, multi-component interventions those that combine education, psychosocial elements, and referral pathways have demonstrated improvements in caregiver confidence and patient-level outcomes in similar settings (Wademan et al., 2022). Our qualitative feedback likewise indicated increased caregiver self-efficacy, an important proximal outcome that often precedes sustained behavior change.

The results also align with evidence on the effectiveness of community-based and family-supported TB models (Dilas et al., 2023). Systematic reviews indicate that community DOT, family engagement models, and digitally supported observation (vDOT/VOT) can be at least as effective as facility-based approaches when accompanied by appropriate education and support (Chiang et al., 2023). Our data extend these findings by showing that purposely designed caregiver training can amplify the benefits of family-centred delivery models by improving the household's capacity to deliver safe, adherent care. However, as the literature cautions, program acceptability and sustainability depend on local adaptation, ongoing supervision, and addressing socioeconomic barriers to engagement (Kurbaniyazova et al., 2023).

Several limitations temper interpretation. First, the sample size was small and the study used a single-group pre-post design without a control arm; therefore, outcomes should be interpreted as preliminary evidence of effect rather than definitive proof of causal impact. Second, knowledge gains were measured immediately after training, so the durability of those gains (retention at 3–6 months) and translation into sustained caregiving behaviors (e.g., documented adherence, reduced household transmission) were not assessed in this analysis. These limitations mirror common challenges reported in community TB interventions and point to priorities for future research.

4. CONCLUSION

The Dingsanak Peduli TB caregiver empowerment intervention achieved meaningful, domain-specific knowledge gains among caregivers in Keliling Benteng Ulu. Improvements in medication adherence knowledge and household prevention practices were particularly pronounced, suggesting that focused, practical training can rapidly strengthen the household capacity to support TB care. To confirm and extend these findings, larger controlled studies with longer follow-up and linkage to clinical outcomes are recommended. Meanwhile, programmatic adoption of structured caregiver training integrated with primary care and community health worker support represents a promising and low-cost strategy to enhance person-centred TB care in high-burden, hard-to-reach settings.

5. ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to Universitas Lambung Mangkurat for providing funding and institutional support through the *Program Dosen Wajib Mengabdi (PDWA) 2025*. This community engagement would not have been possible without the financial assistance, facilities, and academic guidance facilitated by ULM. The authors also extend their appreciation to the local government of Desa Keliling Benteng Ulu, the staff of Puskesmas Martapura Barat, and all participating families and caregivers who generously shared their time and commitment throughout the program.

6. REFERENCES

Akalu, T. Y., Clements, A. C. A., Wolde, H. F., & Alene, K. A. (2023). Economic burden of multidrug-resistant tuberculosis on patients and households: a global systematic review and meta-analysis. *Scientific Reports*, *13*(1), 22361. https://doi.org/10.1038/s41598-023-47094-9

Alinaitwe, B., Shariff, N. J., & Madhavi Boddupalli, B. (2025). Treatment adherence and its association with family support among pulmonary tuberculosis patients in Jinja, Eastern Uganda. *Scientific Reports*, *15*(1), 11150. https://doi.org/10.1038/s41598-025-96260-8

Chiang, S. S., Senador, L., Altamirano, E., Wong, M., Beckhorn, C. B., Roche, S., Coit, J., Oliva Rapoport, V. E., Lecca, L., & Galea, J. T. (2023). Adolescent, caregiver and provider perspectives on tuberculosis treatment adherence: a qualitative study from Lima, Peru. *BMJ Open*, *13*(5), e069938. https://doi.org/10.1136/bmjopen-2022-069938

Cocozza, A. M., Linh, N. N., Nathavitharana, R. R., Ahmad, U., Jaramillo, E., Gargioni, G. E. M., & Fox, G. J. (2020). An assessment of current tuberculosis patient care and support policies in high-burden countries. *The International Journal of Tuberculosis and Lung Disease : The Official Journal of the International Union against Tuberculosis and Lung Disease*, *24*(1), 36–42. https://doi.org/10.5588/ijtld.19.0183

Dilas, D., Flores, R., Morales-García, W. C., Calizaya-Milla, Y. E., Morales-García, M., Sairitupa-Sanchez, L., & Saintila, J. (2023). Social Support, Quality of Care, and Patient Adherence to Tuberculosis Treatment in Peru: The Mediating Role of Nurse Health Education. *Patient Preference and Adherence*, *17*, 175–186. https://doi.org/10.2147/PPA.S391930

Ghazy, R. M., El Saeh, H. M., Abdulaziz, S., Hammouda, E. A., Elzorkany, A. M., Khidr, H., Zarif, N., Elrewany, E., & Abd ElHafeez, S. (2022). A systematic review and meta-analysis of the catastrophic costs incurred by tuberculosis patients. *Scientific Reports*, *12*(1), 558. https://doi.org/10.1038/s41598-021-04345-x

Hammouda, E. A., Ashmawy, R., Hassan, M. A., & Ghazy, R. M. (2025). Exploring the quality of life and its determinants among caregivers of patients with tuberculosis: a cross-sectional study. *BMC Public Health*, *25*(1), 2832. https://doi.org/10.1186/s12889-025-23854-2

Johnson, L. S., Anthony, M. G., Purdy, C., Luke, V., van Deventer, H., van Niekerk, M., Viljoen, L., & van der Zalm, M. M. (2025). Caregiver perspectives on TB-related stigma experienced by young children. *IJTLD Open*, *2*(8), 443–449. https://doi.org/10.5588/ijtldopen.25.0293

Kurbaniyazova, G., Msibi, F., Bogati, H., Kal, M., Sofa, A., Abdi Djama, E., Mozi, P., Hossain, F., Blasco, P., & Sannino, L. (2023). TB treatment using family members, treatment supporters and self-administered therapies in rural Papua New Guinea. *Public Health Action*, *13*(2), 60–64. https://doi.org/10.5588/pha.22.0062

Mcinziba, A., Wademan, D. T., Zimri, K., Jacobs, S., Mcimeli, K., Schaaf, H. S., Hesseling, A. C., Seddon, J. A., Wilkinson, T., & Hoddinott, G. (2025). Experiences of children and their caregivers affected by multidrug-resistant tuberculosis in Cape Town, South Africa. *PloS One*, *20*(5), e0323492. https://doi.org/10.1371/journal.pone.0323492

Mohammed, H., Oljira, L., Roba, K. T., Ngadaya, E., Ajeme, T., Haile, T., Kidane, A., Manyazewal, T., Fekadu, A., & Yimer, G. (2020). Burden of tuberculosis and challenges related to screening and diagnosis in Ethiopia. *Journal of Clinical Tuberculosis and Other Mycobacterial Diseases*, *19*, 100158. https://doi.org/https://doi.org/10.1016/j.jctube.2020.100158

Nagarajan, K., Kumarsamy, K., Begum, R., Panibatla, V., Reddy, R., Adepu, R., Munjattu, J. F., Sellapan, S., Arangba, S., Goswami, A., Swamickan, R., & Muniyandi, M. (2022). A Dual Perspective of Psycho-Social Barriers and Challenges Experienced by Drug-Resistant TB Patients and Their Caregivers through the Course of Diagnosis and Treatment: Findings from a Qualitative Study in Bengaluru and Hyderabad Districts of South Indi. *Antibiotics (Basel, Switzerland)*, *11*(11). https://doi.org/10.3390/antibiotics11111586

Sandoval, M., Mtetwa, G., Devezin, T., Vambe, D., Sibanda, J., Dube, G. S., Dlamini-Simelane, T., Lukhele, B., Mandalakas, A. M., & Kay, A. (2023). Community-based tuberculosis contact management: Caregiver experience and factors promoting adherence to preventive therapy. *PLOS Global Public Health*, *3*(7), e0001920. https://doi.org/10.1371/journal.pgph.0001920

Wademan, D. T., Hoddinott, G., Purchase, S. E., Seddon, J. A., Hesseling, A. C., Garcia-Prats, A. J., Reis, R., & Reynolds, L. J. (2022). Practical and psychosocial challenges faced by caregivers influence the acceptability of multidrug-resistant tuberculosis preventive therapy for young children. *PloS One*, *17*(7), e0268560. https://doi.org/10.1371/journal.pone.0268560

World Health Organization. (2024). *Global Tuberculosis Report 2024*. https://www.who.int/teams/global-programme-on-tuberculosis-and-lung-health/tb-reports/global-tuberculosis-report-2024/tb-disease-burden/1-1-tb-incidence

World Health Organization. (2025). *Tuberculosis*. https://www.who.int/news-room/fact-sheets/detail/tuberculosis?utm_source=chatgpt.com