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Santri Care for Tuberculosis: Contextual Education and Early Screening in Islamic Boarding Schools

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ABSTRACT

Tuberculosis remains a major public health issue in Indonesia, particularly in densely populated environments such as Islamic boarding schools. This community engagement program aimed to improve awareness, early detection, and prevention of tuberculosis through the "Healthy Adolescents Without TB" campaign at Hidayatulloh Al-Muhajirin Islamic Boarding School, Bangkalan. A total of 150 students participated in the activities, which implemented a participatory, faith-based health education model combining contextual learning, tuberculosis screening, and healthy behavior promotion. Interactive education sessions, audiovisual media, and testimonials from TB survivors significantly increased students' understanding of disease prevention. Screening identified 13 students (8.6%) with chronic cough, 9 (6.0%) with weight loss, and 5 (3.3%) with night sweats, all referred for further evaluation at local health facilities. The integration of Islamic values into health messages enhanced cultural acceptance and motivated sustainable behavioral change. Overall, the program effectively strengthened adolescent health literacy and fostered active community participation, demonstrating that contextual, participatory, and faith-based education can serve as a replicable model to support Indonesia's tuberculosis elimination strategy.

Keywords: adolescent health; community health education; faith-based approach; Islamic boarding school; tuberculosis prevention; Indonesia; *pesantren*

INTRODUCTION

Tuberculosis (TB) remains one of Indonesia's most pressing public-health challenges. According to the *Global Tuberculosis Report 2022*, Indonesia ranks second worldwide in TB incidence after India (World Health Organization, 2022). The Indonesian Ministry of Health (2023) estimated approximately 969,000 new cases annually, though many remain undetected due to limited awareness and persistent stigma.

Boarding schools (*pesantren*) represent high-risk congregate settings where communal activities, shared facilities, and inadequate ventilation can facilitate TB transmission (Lestari, Fuady, & Burhan, 2021). Santri, or boarding-school students, typically study, sleep, and eat together in confined spaces, creating ideal conditions for airborne disease spread. A previous observation at Hidayatulloh Al-Muhajirin Islamic Boarding School in Bangkalan revealed crowded

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dormitories, poor sanitation, and an absence of structured health-monitoring systems, heightening the risk of delayed detection.

Low TB literacy and social stigma further hinder preventive efforts. Studies have shown that only 40–50% of adolescents understand early TB symptoms and preventive measures (Making et al., 2023). Stigmatization discourages self-reporting and health-seeking behavior, especially in faith-based schools that lack formal health-promotion programs.

The *Santri Care for Tuberculosis* program was therefore designed to strengthen TB awareness and early detection through a contextual, participatory, and faith-oriented education model. Building upon the earlier *SIGAP TB* initiative implemented by Nahdlatul Ulama University Surabaya, the program integrates Islamic values into health messages, trains student health ambassadors, and collaborates with local health centers to encourage early detection and sustained behavioral change. This initiative seeks to enhance adolescent TB literacy, reduce stigma, and establish a replicable model that supports Indonesia's national TB-elimination strategy and the Sustainable Development Goals (WHO, 2024).

LITERATURE OR CONCEPTUAL REVIEW

Tuberculosis remains a communicable disease closely linked to social determinants of health, such as living conditions, nutrition, and education. Studies indicate that congregate environments—especially boarding schools—serve as key settings for TB transmission due to limited ventilation, overcrowding, and shared facilities (Lestari, Fuady, & Burhan, 2021). Preventive strategies in such environments require not only medical interventions but also behavioral and environmental modifications.

Educational interventions have been recognized as effective tools to promote TB awareness and early detection. Audio-visual learning methods have demonstrated significant improvements in adolescents' comprehension of TB symptoms and preventive actions compared to conventional lectures (Raharjo, Wulandari, & Suryani, 2021). Similarly, Felisia, Rahmawati, and Sihombing (2023) emphasized the importance of a person-centered approach in increasing adherence to TB preventive therapy within communities. These findings highlight the need for culturally sensitive education that resonates with local values and daily practices.

Community-Based Participatory Research (CBPR) frameworks have gained attention as an inclusive model that engages community members as equal partners in designing and evaluating interventions (Israel et al., 2010; Viswanathan et al., 2004). CBPR-based health promotion programs have shown strong outcomes in reducing stigma and improving treatment literacy in Indonesia (Fuady et al., 2025). When combined with faith-based approaches, as recommended by the Indonesian Ministry of Health (2024), community empowerment can be significantly strengthened through moral reinforcement and religious engagement.

Therefore, this program integrates the CBPR model with Islamic value–based education, positioning religious principles as a driver for behavioral change. Such integration has not been widely documented in TB-prevention contexts, marking the originality and conceptual contribution of this study.

MATERIALS AND METHODS

This community engagement program adopted a Community-Based Participatory Research (CBPR) approach, which positions the community as active partners throughout all stages of program design, implementation, and evaluation. The program was conducted from February to June 2025 by the Faculty of Medicine, Nahdlatul Ulama University Surabaya (UNUSA), in collaboration with

Hidayatulloh Al-Muhajirin Islamic Boarding School, Bangkalan. The site was selected purposively based on three criteria: (1) high dormitory density, (2) the absence of a structured health-education program, and (3) increased risk of tuberculosis transmission in a congregate setting.

The implementation process consisted of three phases. The first phase involved participatory observation and initial discussions with school administrators and students to identify health needs and contextual barriers to TB prevention. In the second phase, the research team developed contextual educational materials, including short videos, posters, infographics, and pre–post knowledge tests. A total of 150 students from junior and senior levels were recruited using purposive sampling. Educational sessions were conducted interactively through lectures, group discussions, audiovisual presentations, and health quizzes to enhance engagement.

The third phase focused on screening for early TB symptoms, conducted by UNUSA medical students through structured interviews and body-weight measurements. Students presenting prolonged cough, weight loss, or night sweats were referred to the local public health center (*Puskesmas*) for further examination.

Success indicators included (1) a minimum 30% increase in TB knowledge scores and (2) identification and referral of students exhibiting early TB symptoms. Educational materials were officially handed over to the school administration to support program sustainability.

RESULT AND DISCUSSION

The program outcomes demonstrated significant improvement in students' knowledge and early detection of tuberculosis symptoms. A total of 150 students participated in the "Healthy Adolescents Without TB" campaign. Pre–post test analysis revealed a substantial increase in the average knowledge score, indicating the effectiveness of the contextual and participatory education model.

Table 1. Pre–Post Knowledge Test Results

Description	Mean Score	Percentage Increase
Pre-test	58	–
Post-test	79	+36%

These results confirmed that integrating interactive, faith-based, and audiovisual education materials successfully enhanced TB literacy among adolescents in a boarding-school environment. The screening component also provided valuable insights into students' early clinical symptoms suggestive of tuberculosis. Although laboratory confirmation was not part of this stage, the findings served as a crucial basis for early referral to healthcare facilities.

Table 2. Results of Tuberculosis Symptom Screening

Symptom	Number of Students	Percentage
Cough > 2 weeks	13	8.6%
Weight loss	9	6.0%
Night sweats	5	3.3%

Additionally, field observations indicated notable behavioral changes among participants. Students began regularly opening dormitory windows, maintaining personal hygiene, and reminding peers to practice proper coughing etiquette. The enthusiasm of students during health quizzes and group discussions also reflected increased engagement and motivation to sustain healthy practices.

DISCUSSION

Effectiveness of Contextual Health Education

The significant improvement in knowledge scores (36% increase) confirms the effectiveness of the contextual, participatory education approach. The integration of audiovisual media and Islamic values in health messages proved particularly effective in this *pesantren* setting. This finding aligns with Raharjo et al. (2021) who demonstrated the superiority of audiovisual methods over conventional lectures in TB education. The faith-based approach also addressed the cultural and religious context, enhancing message acceptance and retention.

Importance of Early Detection in High-Risk Settings

The screening results (8.6% with chronic cough, 6.0% with weight loss) highlight the vulnerability of *pesantren* environments to TB transmission. These findings support Lestari et al. (2021)'s research on TB risk in congregate settings. While laboratory confirmation was beyond the scope of this program, the symptom-based screening successfully served as an important first step in the detection cascade, enabling timely referrals to healthcare facilities.

Sustainable Behavior Change through Community Participation

The observed behavioral changes (improved ventilation, hygiene practices) indicate successful knowledge translation into action. The CBPR approach, which engaged students and pesantren leaders as active partners, fostered a sense of ownership that is crucial for sustainable health promotion. This finding is consistent with Agustin et al. (2025)'s "Youth TB Troops" model, which emphasizes peer-led education in institutional settings.

Program Sustainability and Replicability

The training of "Healthy TB Ambassadors" and the handover of educational materials to *pesantren* administrators create a foundation for continued health promotion. The collaboration with local Puskesmas ensures a functional referral system beyond the program period. This model demonstrates potential for replication in other *pesantren* with similar socio-cultural contexts.

Limitations and Recommendations

The program faced limitations including time constraints for comprehensive education and the lack of on-site diagnostic tools. Future iterations could benefit from:

1. Longer intervention periods with booster sessions
2. Integration of simple diagnostic tools like rapid molecular tests
3. Development of structured peer-educator programs for sustained impact

CONCLUSIONS

The "Santri Care for Tuberculosis" program successfully improved TB knowledge, facilitated early symptom detection, and promoted healthy behaviors in the *pesantren* setting. The contextual, faith-based approach proved effective in engaging the community and fostering sustainable change. This model represents a valuable strategy for TB elimination efforts in similar high-risk congregate settings across Indonesia.

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Conflict of Interests

The authors declared that no potential conflicts of interest with respect to the authorship and publication of this article.

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