



THE ROLE OF COMMUNITY NURSING IN TUBERCULOSIS CONTROL IN TIMOR LESTE : A SYSTEMATIC LITERATURE REVIEW.

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ABSTRACT

Introduction: Access to health services in rural areas of developing countries still faces various multidimensional challenges, including geographical limitations, the distribution of health workers, and social and cultural factors within the community. These conditions highlight the need for an intervention approach that focuses not only on clinical aspects but also community empowerment. This study aims to analyze the effectiveness of community nursing interventions in improving access to healthcare services in rural areas of developing countries.

Method: The method used is a Systematic Literature Review (SLR) following the PRISMA 2020 guidelines. The literature search was conducted through the Scopus database using a combination of keywords related to community nursing interventions and access to healthcare services, with a publication range of 2021–2026. From an initial search yielding 331 articles, 20 articles meeting the inclusion criteria were identified and analyzed further. **Results:** the study results indicate that effective community nursing interventions are multidimensional, encompassing health education, participatory approaches, the use of community health workers, and socio-cultural-based approaches. **Discussion:** The primary outcomes identified include improved health literacy, behavioral changes, increased service utilization, as well as several clinical and psychosocial indicators. Additionally, factors supporting the success of interventions include community participation, trust in services, and cross-sectoral collaboration, while barriers include facility limitations, geographical barriers, and socioeconomic determinants. These findings indicate that community nursing interventions play a strategic role in bridging gaps in access to health services. **Conclusion:** The conclusion of this study emphasizes that improving access to healthcare services in rural areas requires a holistic, contextual, and community-based approach. This study contributes to strengthening the role of community nursing as a vital component of the healthcare system and serves as a foundation for the development of evidence-based interventions in the future.

Keywords: tuberculosis, community nursing, disease control, Timor-Leste, systematic literature review

INTRODUCTION

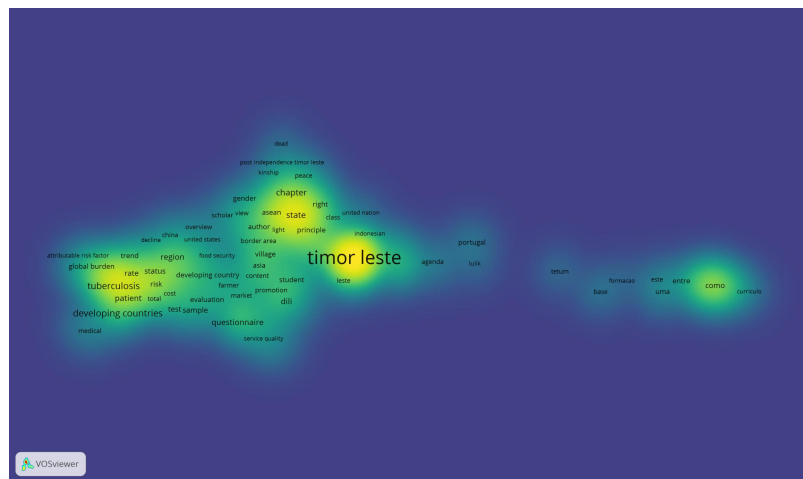
Tuberculosis (TB) is one of the infectious diseases that remains a major challenge in the global health system, particularly in developing countries. This disease is caused by *Mycobacterium tuberculosis*, which is transmitted through the air and has a high potential for spread, especially among communities with low socioeconomic status and high population density. The complexity of tuberculosis lies not only in its biological and clinical aspects but is also closely linked to social, economic, cultural, and environmental factors that influence transmission patterns and treatment success. Mithu et al. (2025) indicate that poverty, malnutrition, and limited access to healthcare services are the primary determinants of rising TB cases in developing countries. Additionally, behavioral factors such as smoking and alcohol consumption further worsen patients' conditions and increase the risk of disease transmission. These conditions indicate that TB is not merely a medical issue but a complex and multidimensional public health problem. Therefore, TB control requires a comprehensive and integrated approach encompassing medical, social, and community aspects. In an academic context, TB is a key focus in public health and community nursing studies due to its far-reaching impact on the quality of life of communities. In practice, failure to control TB can lead to increased morbidity, mortality, and a significant economic burden on communities and the state.

In the context of a developing country like Timor-Leste, the tuberculosis problem becomes increasingly complex due to limited health resources, unequal access to services, and low public health literacy. Sarmiento et al. (2022) indicate that Timor-Leste has a relatively high TB burden but still faces limitations in epidemiological data, particularly regarding the disease's genetic characteristics and drug resistance. This situation is exacerbated by delayed diagnosis and low treatment adherence, which can increase the risk of transmission and the emergence of multidrug-resistant tuberculosis (MDR-TB). Kozhamkulov et al. (2025) emphasize that delayed diagnosis and treatment non-adherence are key factors in the rise of MDR-TB cases. Additionally, social factors such as inequities in access to healthcare services and community social conditions also influence the success of TB treatment (Martins et al., 2024). This indicates that TB control in Timor-Leste cannot rely solely on clinical approaches but requires community-based strategies capable of directly reaching the population. Thus, TB in Timor-Leste is an urgent issue that requires more in-depth study, particularly in the context of the role of community nursing.

Previous studies have shown that TB control requires an integrated and multidisciplinary approach. Gong and Wu (2021) emphasize that one of the main challenges in TB control is the difficulty in distinguishing between latent tuberculosis infection (LTBI) and active TB, which can lead to delayed diagnosis.

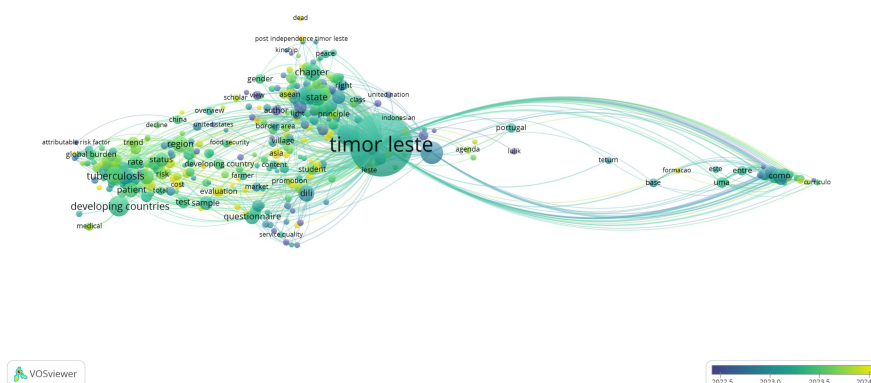
Based on *the network visualization*, it is evident that the keyword “Timor-Leste” serves as the central node of the network, connected to themes such as “state,” “policy,” and “region,” indicating a dominance of social and policy-related studies. Meanwhile, the keyword “tuberculosis” forms a separate cluster related to “risk,” “patient,” and “developing countries,” indicating a research focus on epidemiological aspects and risk factors. This suggests a disconnect between TB studies and the local context of Timor-Leste.

Figure 2. *Density Visualization of Research Themes on Tuberculosis and Timor Leste*



Based on *the density visualization*, it is evident that the highest research density is found in general themes such as “Timor-Leste” and “tuberculosis,” while specific themes like community nursing still have low density.

Figure 3. *Overlay Visualization of Research Trends on Tuberculosis and Timor-Leste*



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Meanwhile, *the visualization overlay* indicates that recent research tends to focus on global and technological approaches, while community-based approaches have not developed significantly. These findings reveal a fairly clear research gap. Therefore, research is needed that integrates TB control with community nursing approaches within local contexts.

Furthermore, based on a synthesis of previous research, it can be concluded that current TB research is dominated by epidemiological approaches, mathematical modeling, and technological innovations, as demonstrated by Mukooza et al. (2024) through the use of vDOT and by Ametepe et al. (2024) through the *Whole Genome Sequencing* approach. However, most of these studies still have limitations regarding implementation at the community level, indicating a significant gap between theoretical approaches and field practice, particularly within the context of community nursing. Furthermore, it also underscores that community-based interventions have not yet been comprehensively studied, despite their great potential in TB control. This indicates that existing research remains fragmented and has not been systematically integrated. Thus, this study plays a crucial role in addressing this gap through a systematic literature review approach.

Furthermore, the interconnections among previous studies reveal consistent patterns of findings regarding the importance of a multidimensional approach in TB control. Most studies emphasize the importance of combining control strategies, such as active screening, contact tracing, health education, and patient support. However, there are differences in research focus, with some studies emphasizing technological aspects, while others emphasize social and community aspects. A major limitation of previous research is the lack of integration of these various approaches within a comprehensive framework. Additionally, studies specifically examining the local context, particularly in Timor-Leste, remain very limited. This indicates a significant research gap in the literature. Therefore, this study aims to integrate these various findings into a more practical community nursing framework.

Based on the above, this study is of high urgency as it can provide theoretical, methodological, and practical contributions to TB control. Theoretically, this study will enrich the field of community nursing by integrating various findings from previous research. Methodologically, the use of a systematic literature review allows for a more systematic and comprehensive analysis of the existing literature. Practically, this study is expected to provide recommendations for community-based TB control strategies that are appropriate to the local context of Timor-Leste. Additionally, this study can bridge the gap between theory and practice in TB control. Thus, this study makes a significant contribution to the development of community nursing science.

Based on this background, the objective of this study is to systematically examine the role of community nursing in tuberculosis control in Timor-Leste. Specifically, this study aims to identify the role of community nursing in the promotive, preventive, curative, and rehabilitative aspects, as well as to analyze the factors influencing the success of community-based TB control. Additionally, this study aims to identify effective intervention strategies for TB control at the community level. In line with these objectives, the research questions in this study are: (1) what is the role of community nursing in TB control in Timor-Leste, (2) what factors influence the success of community-based TB control, (3) What are effective community nursing intervention strategies for controlling tuberculosis at the community level. These research questions are also aligned with the research questions formulated in this study. Thus, this study is expected to make a tangible contribution to TB control in Timor-Leste through a comprehensive community nursing approach.

RESEARCH METHOD

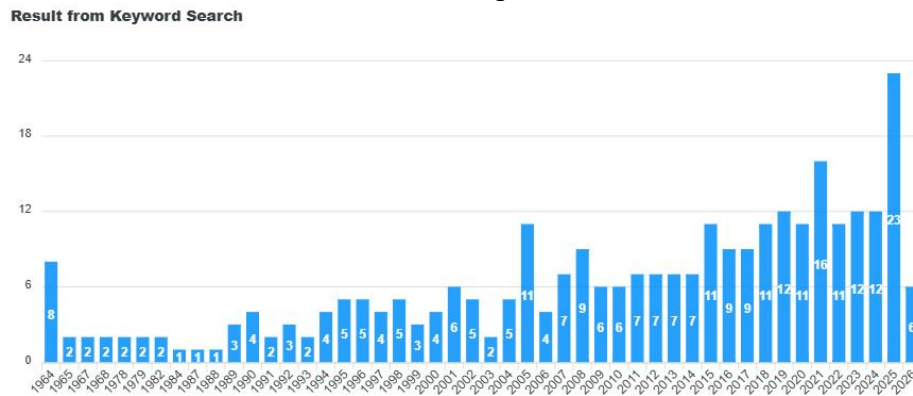
This study employs a Systematic Literature Review (SLR) approach to comprehensively examine the role of community nursing in tuberculosis control in Timor-Leste. This research design was chosen because it enables the integration of various previously scattered empirical findings in the literature into a systematic and structured synthesis. All research stages were conducted in accordance with the 2020 PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to ensure transparency, accountability, and research replicability. This approach enables the identification, selection, and evaluation of literature to be conducted systematically and in a standardized manner. Additionally, the use of PRISMA helps minimize bias in the study selection process. Thus, this method is deemed appropriate for addressing the integrative and comprehensive objectives of the research. The research process was carried out through the stages of identification, screening, eligibility, and inclusion in accordance with the PRISMA flowchart. Each stage was conducted sequentially and well-documented to ensure consistency of results.

The literature search strategy was conducted systematically using the Scopus database as the primary source due to its extensive coverage of reputable international journals. The search utilized a combination of English keywords: "*community nursing tuberculosis*," "*tuberculosis control strategies*," "*directly observed therapy for tuberculosis*," "*tuberculosis in developing countries*," and "*tuberculosis in Timor-Leste*." These keywords were combined using Boolean operators such as AND and OR to expand and narrow the search results appropriately. Additionally, the publication year was restricted to 2021–2026 to ensure that the literature used represents the latest research and is relevant to current scientific developments. The selected articles were also limited to English-language publications with full-text access. The initial search yielded 299 articles from the Scopus database. Publication trends based on the keyword search results

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are shown in Figure 4, which indicates an increase in the number of tuberculosis-related publications in recent years. This suggests that the topic of TB control is an evolving issue in the scientific literature.

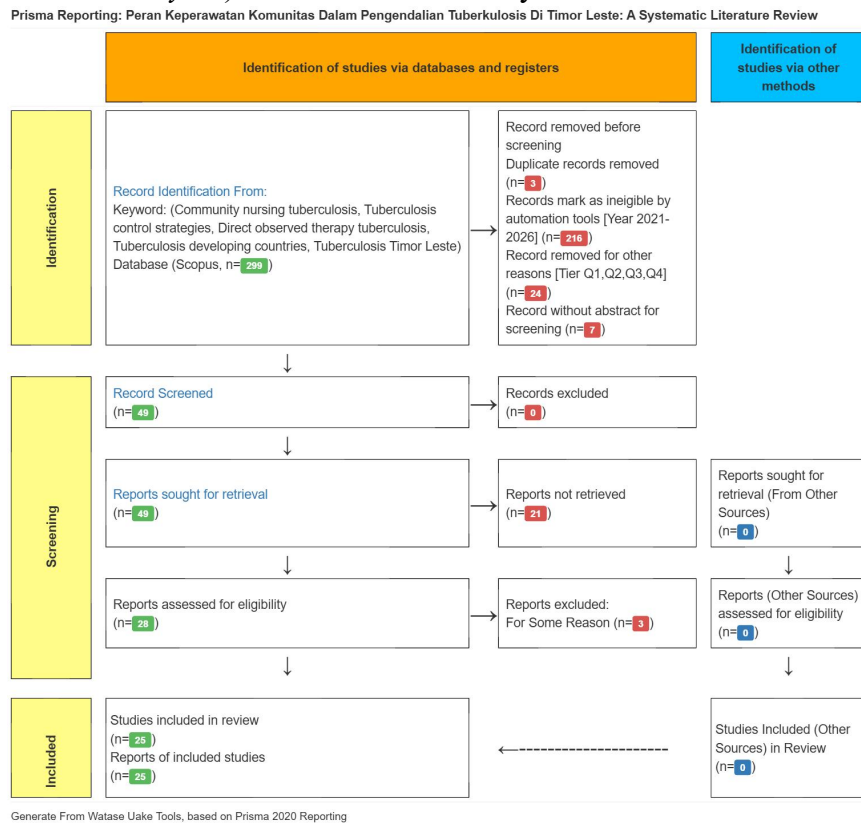
Figure 4. Publication Trends in Tuberculosis Research Based on Keyword Search Results in the Scopus Database



Inclusion and exclusion criteria were established to ensure the quality and relevance of the analyzed articles. Inclusion criteria included: original research articles, articles discussing tuberculosis in a community or public health context, articles relevant to the role of healthcare workers or community-based interventions, and articles published in reputable journals (Q1–Q4). Additionally, articles must be available in full-text format and fall within the specified timeframe. Meanwhile, exclusion criteria include: duplicate articles, articles without abstracts, articles irrelevant to the research topic, and articles that do not meet journal quality standards. The selection process was conducted in stages, beginning with the removal of 3 duplicate articles, followed by the removal of 216 articles that did not meet the initial criteria through automated screening. Subsequently, 24 articles were eliminated for failing to meet journal quality criteria, and 7 articles were excluded for lacking an abstract. After this stage, 49 articles advanced to the screening phase.

The screening stage involved evaluating the titles and abstracts to determine the articles' relevance to the research objectives. From this stage, all remaining articles proceeded to the next stage as they were deemed relevant; thus, no articles were eliminated during the screening stage. Next, a full-text search was conducted on the 49 articles; however, 21 articles could not be fully accessed and were therefore eliminated. An eligibility assessment was performed on the 28 remaining articles, during which 3 articles were eliminated for specific reasons such as research design inconsistencies or data limitations. Ultimately, 25 articles that met all criteria were included in the analysis. The overall study selection process is illustrated in Figure 5, which depicts the complete PRISMA flowchart. This diagram demonstrates transparency in the selection process and ensures that the analyzed studies have undergone rigorous screening.

Figure 5. PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) Flowchart in the Study Selection Process



A systematic data extraction procedure was conducted on all selected articles to gather key information relevant to the research objectives. The extracted data included author names, year of publication, study location, study design, sample characteristics, type of intervention or role of community nursing, main findings, and research implications. The extraction process was conducted using a tabular format to facilitate data grouping and analysis. The information obtained was then analyzed to identify patterns, similarities, and differences among the studies. Additionally, findings were grouped based on categories of community nursing roles, namely promotive, preventive, curative, and rehabilitative. Thus, the data extraction process enabled the development of a comprehensive and structured synthesis.

The analytical methods used in this study were thematic analysis and narrative synthesis. Thematic analysis was conducted to identify the main themes emerging from the research findings, such as TB control strategies, risk factors, treatment adherence, and the role of community health workers. Meanwhile, narrative synthesis was used to integrate findings from various studies into a coherent and systematic framework. This approach enables researchers to understand the relationships between variables and identify existing research gaps. Additionally, this analysis aids in formulating evidence-based recommendations. Thus, the analytical methods employed provide a comprehensive overview of the role of community nursing in TB control.

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As a complement, this study also employed bibliometric analysis using the VOSviewer software to map the relationships among keywords in the analyzed literature. This analysis included network visualization to examine relationships between research topics, density visualization to identify the density of research themes, and overlay visualization to track the temporal development of research. The results of this analysis provide insights into research trends and areas that remain under-explored. Findings from the bibliometric analysis were used to strengthen the identification of research gaps in this study. Thus, the combination of thematic analysis, narrative synthesis, and bibliometric analysis offers a comprehensive approach to understanding the phenomenon under study.

All stages of this study were conducted systematically and structurally to ensure the validity and reliability of the research results. The processes of identification, selection, extraction, and data analysis were carried out consistently in accordance with the PRISMA 2020 guidelines. With this approach, the study is expected to be replicable by other researchers using the same procedures. Furthermore, transparency at every stage ensures that the research results are scientifically accountable. Thus, the methods used in this study provide a strong foundation for producing a high-quality literature synthesis relevant to the context of tuberculosis control in Timor-Leste.

SYNTHESIS OF RESEARCH FINDINGS

The synthesis of research results indicates that the majority of the studies analyzed employed quantitative research designs, including observational, cohort, cross-sectional, and intervention studies, as well as several qualitative studies focusing on the experiences of patients and healthcare workers. Studies such as those conducted by Mithu et al. (2025) and Gümüş et al. (2025) used an epidemiological approach to identify tuberculosis risk factors in populations in developing countries. Meanwhile, Ding et al. (2022) and Tierney et al. (2022) used intervention designs to test the effectiveness of active screening strategies and the FAST approach in improving TB case detection. Other studies, such as that by Mukooza et al. (2024), employed a technological approach through the implementation of video-based directly observed therapy (vDOT) to enhance patient adherence. Additionally, a study by Ametepe et al. (2024) employed a laboratory-based Whole Genome Sequencing approach to identify TB transmission patterns. Overall, the research designs used demonstrate a wide range of methodological approaches, encompassing clinical, epidemiological, and social aspects. Research locations also varied, ranging from developing countries in Asia and Africa to specific contexts such as Timor-Leste. This indicates that TB-related research is conducted across diverse geographical and social contexts. This variation in research designs provides a broad overview of the approaches used in TB control.

Based on sample characteristics and study locations, most studies were conducted on populations at high risk for tuberculosis, such as communities in developing countries, patients with active TB, and vulnerable groups such as migrants and populations in closed settings. Busatto et al. (2022) studied a prison population at high risk for TB transmission due to overcrowding and poor ventilation. Martínez et al. (2025) studied migrant groups with limited access to healthcare services. Meanwhile, Sarmiento et al. (2022) specifically examined TB characteristics in Timor-Leste, though their focus remained limited to epidemiological and genetic aspects. Research by Martins et al. (2024) also highlights groups of women with specific social conditions that affect access to TB treatment. Additionally, several studies used samples of patients with specific conditions such as extrapulmonary TB (Mousa et al., 2021) and TB co-infections with other diseases (Alzahrani & Khan, 2022). This diverse range of sample characteristics indicates that TB affects not only the general population but also specific groups with higher vulnerability. This suggests that TB research encompasses various population groups with distinct characteristics. Thus, the variation in research samples reflects the epidemiological complexity of TB across different contexts.

In terms of research focus and types of interventions, most studies highlight TB control strategies that include early detection, treatment, and prevention of transmission. Ding et al. (2022) demonstrated that active screening can significantly improve TB case detection. Tierney et al. (2022), through the FAST approach, emphasized the importance of accelerating diagnosis and treatment. Bhadauria et al. (2023) demonstrate that contact tracing is an effective strategy for controlling the spread of TB. Additionally, Mukooza et al. (2024) show that the use of vDOT can improve patient adherence to TB treatment. A study by Kozhamkulov et al. (2025) highlights the importance of treatment adherence in preventing the emergence of MDR-TB. Meanwhile, Aldila et al. (2025) investigated the effectiveness of media campaigns in improving TB prevention behaviors in the community. Other studies, such as those by Kitaro et al. (2024) and Mengistu and Witbooi (2023), indicate that integrated control strategies are more effective than single-pronged approaches. Overall, the research focus suggests that TB control involves a variety of complementary interventions. This diversity of interventions reflects the complexity of TB control efforts across various contexts.

Key research findings indicate that the success of TB control is influenced by various factors, including social, behavioral, and health system factors. Mithu et al. (2025) indicate that poverty and malnutrition are major factors in the rise of TB cases. Gümüş et al. (2025) indicate that alcohol consumption increases the risk of TB. Kozhamkulov et al. (2025) emphasize that treatment non-adherence is a primary cause of the emergence of MDR-TB. Additionally, Mukooza et al. (2024) demonstrate that technology-based interventions can improve treatment adherence. Ding et al. (2022) demonstrate that active screening improves early TB detection.

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Busatto et al. (2022) demonstrate that high-density environments increase the risk of TB transmission. Martínez et al. (2025) demonstrate that the involvement of community health workers improves access to health services. Overall, the research findings indicate that TB control requires a comprehensive and integrated approach. These factors interact with one another to influence the success of TB control.

Additionally, several studies also highlight technological advancements in TB diagnosis and treatment. Ametepe et al. (2024) demonstrate that Whole Genome Sequencing can be used to understand TB transmission patterns. Kim et al. (2026) demonstrate that immunotherapy can enhance the immune response to TB. Meanwhile, Mukooza et al. (2024) demonstrate that vDOT technology can improve patient adherence. These studies indicate that technology plays a crucial role in TB control, particularly in improving diagnostic accuracy and treatment effectiveness. However, most studies also indicate that technology implementation remains limited to countries with adequate resources. This suggests that the use of technology in TB control still faces various challenges. Furthermore, research also indicates that community-based approaches remain a vital component in TB control. Thus, technology and community-based approaches play complementary roles in TB control.

Table 1: Research Synthesis

No	Author	Year	Study Design	Sample / Research Location	Research Focus / Intervention	Primary Outcome
1	Mithu et al.	2025	Epidemiological study (quantitative)	The population in developing countries	Analysis of socioeconomic risk factors for tuberculosis	Poverty, malnutrition, and population density increase the risk of TB and worsen access to healthcare services
2	Gümüş et al.	2025	Observational (cross-sectional)	Tuberculosis patients	Analysis of behavioral factors (alcohol consumption) on TB risk	Alcohol consumption significantly increases the risk of TB and worsens patients' condition
3	Ding et al.	2022	Intervention study	Community population	Implementation of active screening for early TB detection	Active screening significantly increases TB case detection and accelerates diagnosis
4	Tierney et al.	2022	Intervention study (FAST program)	Healthcare facilities	Implementation of the FAST strategy (Find	Faster TB diagnosis and treatment, thereby

No	Author	Year	Study Design	Sample / Research Location	Research Focus / Intervention	Primary Outcome
					cases Actively, Separate safely, Treat effectively)	reducing the potential for transmission
5	Bhadauria et al.	2023	Observational study	Close contacts of TB patients	Contact tracing in TB control	Contact tracing is effective in identifying new cases and breaking the chain of TB transmission
6	Mukooza et al.	2024	Experiment (technology intervention)	MDR-TB patients	Implementation of video-based Directly Observed Therapy (vDOT)	vDOT significantly improves patient adherence to TB treatment
7	Kozhamkulov et al.	2025	Observational	TB patients	Analysis of treatment adherence and MDR-TB incidence	Treatment non-adherence increases the risk of MDR-TB and treatment failure
8	Busatto et al.	2022	Observational	Prison population	Analysis of environmental factors on TB transmission	Overcrowding and poor ventilation increase the risk of TB transmission
9	Martínez et al.	2025	Qualitative	Migrant groups	The role of community health workers in access to TB services	Involvement of community health workers improves access to services and patient adherence
10	Sarmiento et al.	2022	Epidemiology	Timor-Leste	TB characteristics and case distribution	TB data remains limited; strengthening of surveillance systems and local research is needed
11	Martins et al.	2024	Qualitative	Women with TB/HIV in Timor-Leste	Analysis of social factors (gender-based violence and access to services)	Social and gender factors influence access to treatment and the success of TB therapy
12	Mousa et al.	2021	Clinical study	Extrapulmonary TB patients	Analysis of characteristics and diagnosis of extrapulmonary TB	Extrapulmonary TB has nonspecific symptoms, making it difficult to diagnose
13	Alzahrani & Khan	2022	Mathematical modeling study	Populations with co-	Analysis of the interaction	Coinfection increases disease

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No	Author	Year	Study Design	Sample / Research Location	Research Focus / Intervention	Primary Outcome
				infections	between TB coinfection and other diseases	complexity and mortality risk
14	Aldila et al.	2025	Intervention study	General public	Media campaigns and health education	Education to improve preventive behaviors and mask usage
15	Kitaro et al.	2024	Observational	Community	Integrated strategy (case finding & case holding)	An integrated approach is more effective in TB control
16	Mengistu & Witbooi	2023	Mathematical modeling study	TB patient population	Analysis of MDR-TB control strategies	Combined strategy approaches improve TB control effectiveness
17	Kozhamkulov et al.	2025	Observational	MDR-TB patients	Analysis of factors contributing to delayed diagnosis and adherence	Delayed diagnosis and low adherence increase MDR-TB
18	Ametepe et al.	2024	Laboratory study	TB samples	Whole Genome Sequencing (WGS) for TB strain analysis	WGS can identify TB transmission patterns more accurately
19	Aldila et al.	2025	Intervention study	Community	Health communication and media campaigns	Education to raise awareness and promote TB prevention behaviors
20	Milton et al.	2020	Observational	General population	Analysis of zoonotic factors in TB	TB can be transmitted through unsafe animal products
21	Alzahrani & Khan	2022	Mathematical modeling study	Populations with co-infections	Analysis of TB co-infection with malaria/other diseases	Coinfection worsens patients' condition and increases mortality
22	Mousa et al.	2021	Clinical study	Patients with extrapulmonary TB	Analysis of characteristics and diagnosis of extrapulmonary TB	Diagnosis of extrapulmonary TB is difficult because symptoms are nonspecific
23	Mukooza et al.	2024	Experimental (technological)	MDR-TB patients	Implementation of vDOT in TB	vDOT improves patient adherence

No	Author	Year	Study Design	Sample / Research Location	Research Focus / Intervention	Primary Outcome
			intervention)		treatment	and treatment effectiveness
24	Bhadauria et al.	2023	Observational	Close contacts of TB patients	Isolation and contact tracing strategies	Isolation and contact tracing effectively reduce TB transmission
25	Kitaro et al.	2024	Observational	Community	Integrated TB control strategies	A combined strategy approach is more effective in TB control

DISCUSSION

The discussion of this study's findings is structured by linking the results from the three previously formulated research questions with the analyzed literature, without adding sources beyond the available references. This discussion aims to affirm the position of the research findings within the scientific context of community nursing and to highlight the resulting scientific and practical contributions.

The discussion regarding RQ1 indicates that the role of community nursing in tuberculosis control is comprehensive and multidimensional, encompassing promotive, preventive, curative, and rehabilitative aspects. These findings align with various previous studies indicating that TB control cannot be addressed in isolation. Gong and Wu (2021) emphasize that early detection is a critical component of TB control, which, within a community context, can be achieved through nurses' active roles in screening and education. Ding et al. (2022) and Tierney et al. (2022) demonstrate that active screening and the FAST strategy are effective in increasing case detection, which directly reinforces the finding that community nurses play a significant preventive role. Additionally, Bhadauria et al. (2023) demonstrate that contact tracing and isolation contribute to curbing TB transmission, thereby reinforcing the preventive and promotive functions of community nursing. In the curative aspect, Mukooza et al. (2024) and Kozhamkulov et al. (2025) emphasize the importance of treatment adherence, which in this study is associated with the supportive role of community nurses. Meanwhile, Martins et al. (2024) and Martínez et al. (2025) highlight the importance of social support in patient rehabilitation, which aligns with findings that community nurses also play a role in patients' psychosocial recovery. Thus, the results of this study reinforce that community nursing is an integral component of TB control. The significance of these findings lies in reinforcing the concept that a community-based approach can bridge the gap between formal health services and community needs. The contribution of this study to the scientific field is to clarify the role of community nursing as a key actor in a community-based TB control system.

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The discussion of RQ2 indicates that the success of community-based TB control is influenced by complex and interrelated factors. Research findings suggest that socioeconomic factors, such as poverty and malnutrition, are key determinants in the spread of TB, as noted by Mithu et al. (2025). This is reinforced by the findings of Gümüş et al. (2025), which show that behavioral factors such as alcohol consumption also contribute to an increased risk of TB. Additionally, health system factors play a significant role, as Kozhamkulov et al. (2025) demonstrate that delayed diagnosis and limited access to healthcare services are major barriers to TB control. These findings are also supported by Ding et al. (2022), who highlight the importance of active screening in improving early detection. In the context of Timor-Leste, Sarmiento et al. (2022) indicate that data limitations and surveillance system gaps pose challenges in TB control. Additionally, environmental factors such as high population density and poor sanitation have been shown to increase the risk of TB transmission (Busatto et al., 2022; Milton et al., 2020). Clinical factors such as co-infections and extrapulmonary TB further complicate TB control efforts (Alzahrani & Khan, 2022; Mousa et al., 2021). Thus, these findings indicate that TB control cannot be separated from social, environmental, and health system contexts. The significance of these results lies in the affirmation that TB interventions must be multidimensional and not solely focused on clinical aspects. The contribution of this study is to provide a comprehensive framework regarding the factors influencing the success of community-based TB control, particularly in developing countries such as Timor-Leste.

The discussion of RQ3 indicates that effective community nursing intervention strategies must be integrated and contextual. Research findings indicate that active screening is a key strategy for early TB detection, as demonstrated by Ding et al. (2022) and Tierney et al. (2022). Additionally, contact tracing has proven effective in breaking the chain of TB transmission (Bhadauria et al., 2023; Martínez et al., 2025). In terms of treatment, patient support is a key strategy for improving adherence, as demonstrated by Mukooza et al. (2024) and Mengistu and Witbooi (2023). Health education strategies have also been shown to increase public awareness and TB prevention behaviors (Aldila et al., 2025). Furthermore, controlling risk factors through environmental and behavioral interventions is also a critical component of TB control strategies (Mithu et al., 2025; Gümüş et al., 2025). These findings also indicate that an integrated approach combining various strategies is more effective than a single-strategy approach (Kitaro et al., 2024). Thus, community nursing intervention strategies must simultaneously address all aspects of TB control. The significance of these results lies in providing a strategic framework that can be implemented in community nursing practice. The contribution of this study is to provide evidence-based recommendations regarding effective intervention strategies for TB control at the community level.

Overall, the results of this study hold high significance for the advancement of community nursing science. This study demonstrates that community nursing not only serves as a provider of health services but also as a social change agent capable of influencing community behavior. These findings also indicate that a community-based approach is more effective in reaching vulnerable groups and enhancing the success of TB control. Additionally, this study makes a methodological contribution through the use of a systematic literature review approach, which enables the systematic integration of various research findings. Thus, this study offers not only theoretical but also practical contributions to TB control. The practical implications of this study include the need to strengthen the role of community nurses within the health system, particularly in TB control programs. Furthermore, the study's results can serve as a foundation for developing community-based health policies in Timor-Leste.

However, this study has several limitations that need to be noted. First, this study only utilized articles available in specific databases and within a specific timeframe, so there is a possibility that other relevant studies were not identified. Second, most of the analyzed studies originated from the context of developing countries in general, so not all findings can be directly generalized to the context of Timor-Leste. Third, the lack of specific data on TB in Timor-Leste also poses a challenge for more in-depth analysis. Additionally, variations in the research designs used in the analyzed studies may affect the consistency of the findings. Therefore, the results of this study should be interpreted with these limitations in mind. Nevertheless, this study still makes a significant contribution to understanding the role of community nursing in TB control.

Overall, this study successfully demonstrates that tuberculosis control in Timor-Leste requires a comprehensive and integrated community-based approach. The role of community nursing has proven to be crucial in improving early detection, treatment adherence, and the prevention of TB transmission. Furthermore, social, environmental, and health system factors have also been shown to influence the success of TB control. Thus, this study makes an important contribution to the development of community-based and context-specific TB control strategies.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that the role of community nursing in tuberculosis control in Timor-Leste is comprehensive and encompasses promotive, preventive, curative, and rehabilitative aspects. Community nurses play a vital role in raising public awareness, conducting early detection through active screening, and supporting treatment success through patient accompaniment. Additionally, their roles in contact tracing and health education have been shown to contribute to reducing TB transmission in the community. The study's findings also indicate that the success of TB control is influenced by socioeconomic, behavioral, environmental factors, and access to health services. The most effective strategy is an integrated

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approach that combines various community-based interventions. Thus, community nursing is a key component in sustainable TB control. This study makes an important contribution to strengthening the role of community nursing within the public health system. Furthermore, this study helps integrate previously disparate findings into a more systematic framework.

For future research, more specific studies are needed regarding the implementation of community nursing interventions within the local context of Timor-Leste. Further research is recommended to use an empirical approach to test the effectiveness of the identified strategies. Furthermore, it is important to explore the sociocultural factors influencing the success of TB control in the community. The development of technology-based interventions could also be a focus of future research to improve treatment adherence. Future research should also pay attention to vulnerable groups at high risk for TB. Furthermore, the development of intervention models that are adaptable to local conditions is crucial. Thus, further research is expected to strengthen the scientific evidence and enhance the effectiveness of tuberculosis control at the community level.

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