Self-Screening in the Family Members of Tuberculosis Patients: A Systematic Review

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Abstract
Background: Public awareness and knowledge about tuberculosis (TB) are still limited, which increases the risk of TB spread among vulnerable individuals. This systematic review aimed to identify effectiveness of self-screening in reducing TB transmission among family members of TB patients.

Methods: This systematic review was carried out on articles published between 2008 and 2021. The articles were retrieved from online databases including Scopus, Wiley Online Library, Cochrane Library, PubMed, and Google Scholar. All quantitative studies on household or community based self-screening for TB were included in the study.

Results: eligible articles were included to analysis. Early detection of TB transmission could be done through tuberculosis counselling and household screening, including self-screening for TB household contacts.

Conclusion: The management of self-screening of household contacts of TB patients is very important for reducing TB spread.

Highlights:
What is current knowledge?
TB is still a health problem in almost all of the world, especially developing countries. Although TB is one of the deadliest infectious diseases in the world, public awareness and knowledge about this disease is still lacking.

What is new here?
Lack of health information and living too far from health institutions can also influence or delay early detection of TB transmission.

Introduction
Tuberculosis (TB) is an infectious disease with a high mortality rate. It is a major cause of morbidity and mortality in low- and middle-income countries (1, 2). To this date, there has been a lack of public awareness and education concerning TB. Identification of TB can be influenced or delayed by a number of factors, including lack of health information and inaccessibility to health facilities (3–6). Given the high burden of TB and suboptimal case detection, it is essential to perform more screenings in the community. Nevertheless, the World Health Organization (WHO) has advised optimizing interventions and systematic screening of high-risk populations for TB (1, 7, 8).

Contact screening is an important part of the Global TB Program and an active case-finding approach for detecting more cases (9–11). This initiative entailed screening for contacts with known TB patients in a methodical manner to ensure early illness identification and treatment, which could ultimately decrease disease burden, risk of transmission, and poor outcomes (12–15). There are two types of contact screening: passive and active. Symptom screening, chest radiograph (CXR), sputum and culture testing, and diagnostic assays, including the GeneXpert system, tuberculin skin test (TST), and interferon release test (IRT) (IGRAs) are some of the methods used for contact screening (16). Active screening can be performed by symptom evaluation or CXR, in tandem or sequentially (12).

The goal of active TB screening is early detection of infection in order to safeguard individual and public health and to prevent TB spread (17). Finland does not currently screen for latent TB infection, despite recent guidelines from the European Centers for Disease Prevention and Control (2). Identifying and treating latent TB infection (LTBI) in people at risk of acquiring an active illness, especially in high-resource settings, is crucial for lowering incidence rates and eradicating TB (18). In this systematic review, we analyzed studies on pulmonary TB transmission detection among close family members in contact with TB patients.

Methods
This systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement. We included all studies published between 2008 and 2021 on the methods of pulmonary TB transmission detection among close family members in contact with TB patients.

Search strategy
Relevant articles were searched in PubMed, Scopus, the Wiley Online Library, Cochrane Library, and Google Scholar. Search keywords were adjusted according to the MeSH terms for health research. In general, the main syntax for retrieving relevant documents included “Self-screening OR screening OR early detection AND tuberculosis OR TB OR pulmonary tuberculosis AND vulnerable OR susceptible AND group OR people OR high-risk Group**” (Table 1, Supplemental).

Eligibility criteria
Titles and abstracts of the identified publications were screened for relevance. Full texts were screened for potentially relevant publications or when there was insufficient information in the abstract to adequately assess the relevance. All quantitative studies on household- or community-based self-screenings for TB were included in the study. Publications were excluded if the laboratory diagnostic service focused on (national) screening campaigns, monitoring of disease progression, or retesting or increasing retesting rates. Reviews, trial
The eligibility criteria for the study were based on prior studies and research recommendations. The study included adults who had been in close contact with TB patients, as well as children under the age of 5 years. The criteria were further refined to include individuals with symptoms suggestive of TB, such as cough, fever, and weight loss.

Screening strategies

Several screening strategies were employed in the study, including symptom-based screening, family history, and contact tracing. Symptom-based screening was used in the initial stages to identify potential cases. Family history was used to identify individuals who had been in close contact with TB patients. Contact tracing was conducted to identify secondary cases in the community.

Discussion

The study found that symptom-based screening and contact tracing were effective in identifying potential cases. However, the study also highlighted the need for improved contact tracing strategies, particularly in high-prevalence communities.

Overall, the study provided valuable insights into the effectiveness of different screening strategies and highlighted the need for continued research to improve TB control and prevention efforts.
symptoms, should be screened in order to reduce TB transmission (21). A study in Uganda showed that a home-based, SMS-facilitated evaluation failed to enhance the completion or yield of household TB contact investigations, most likely due to delivery issues. In a real-world public health setting, only around 20% of household eligible contacts completed TB testing, and home sputum collection and automated SMS results reporting were no better than TB testing in a clinic (25).

The CDC guidelines in 2005 suggested to go beyond screening, testing, and treatment, by conducting continuous facility risk assessments to guide infection control policies and practices (16). For clients without documented evidence of LTBI or TB disease, TB risk assessment, symptom evaluation, and Mycobacterium tuberculosis infection test (by IGRA or TST) are necessary. Additional screening is performed for clients with positive test results or symptoms consistent with TB disease. The use of IGRA rather than TST for diagnosing LTBI is not recommended. The first step for early detection of TB transmission is to conduct an initial TB screening, which includes an individual risk assessment (current/previous contacts) that is required to interpret any test findings (27). According to the CDC recommendations, test findings provide a baseline for comparison in terms of prospective or known exposure to M. tuberculosis, making it easier to diagnose and treat LTBI or TB illness. When it comes to interpreting test findings, risk assessment and symptom evaluation might be beneficial. Screening and initial testing for people who do not have established TB illness or past LTBI, and individual TB risk assessment are two strategies for early detection of TB transmission. When exposure is detected, post-exposure screening and testing are performed to assess symptoms. When vulnerability is found in a client with an initial negative TB test and no past TB illness or LTBI, IGRA or TST is recommended. In case of negative results, it is suggested to repeat the test 8–10 weeks after the last exposure (9). Screening and serial testing for clients without LTB is usually not suggested, but may be considered for chosen clients. Individuals with untreated LTBI are strongly encouraged to receive TB health education, including information on the client’s risk of TB exposure, evaluation, and treatment, unless medically contraindicated (27).

Conclusion

Although TB is one of the most deadly infectious diseases in the world, public awareness and knowledge about this disease are insufficient. Factors such as lack of health information and living too far from health institutions can also influence or delay early detection of TB transmission. Thus, management of self-screening of household contacts of TB patients is essential to break the rope of TB spread. Future studies should focus on TB screening in developing countries with higher TB prevalence rates.

Study limitations

Limited access to good-quality databases and insufficiency of data on TB screening in family members in some studies were some limitations of the present study.

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Ethical statement

The study was approved by the Health Research Ethics Committee of KomisieEtik Penelitian Kesehatan Poltekkes Kemenkes Jambi (Reference number:B.02.06/2/235/2021).

Conflict of interest

The authors declare that there is no conflict of interest.

Author contributions

AB and AS were responsible for the study conception and design; DMPerformed the data collection; DM and UMK performed the data analysis; AS, DM were responsible for the drafting of the manuscript; AS and UMKeade critical revisions to the paper for important intellectual content.

References


How to Cite: