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Factors Associated for Anti Tuberculosis Treatment Non-Adherence Among Tuberculosis Patients: Scoping Review

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ABSTRACT

Introduction: Tuberculosis (TB) is one of the leading causes of death in the world. Every year more than 10 million people continue to be infected with TB. One of the main challenges in controlling TB is patient non-compliance in taking medication. This causes TB treatment failure, drug resistance, high mortality rates, and prolonged transmission of TB in the community.

Objective: This article aims to describe the factors associated for anti tuberculosis treatment amongTB patients.

Method: This study uses a literature review from 2021-2024 on four databases, namely Scopus, ProQuest, ScienceDirect, PubMed using the keywords factors associated, non-adherence, anti-tuberculosis treatment. The results of the screening obtained 111 articles and after selection, 5 articles were obtained that met the criteria for the purpose of writing.

Result: The review results found that lack of family support (OR = 3.51, 95% CI: 1.15, 10.75), socio-demographic status male (OR = 1.41, 95% CI: 1.18, 1.68), older age (OR = 1.56, 95% CI: 1.05, 1.67), lower education (OR = 1.60, 95% CI: 1.27, 2.03) , drug side effect (OR = 2.3, 95% CI: 1.1, 4.9) , smoking status (OR = 1.78, 95% CI: 1.47, 2.16) assosiated for non-adherence anti tuberculosis treatment among TB pastients.

Conclusion: Factors such as lack of family support, demographic status (male and older age), lower education, drug side effects, smoking status affect non-adherence to medication in TB patients. Interventions targeting the importance of family support, campaigns targeting older age, males and smokers need to be conducted to increase knowledge about TB, as well as increasing counseling on drug side effects and emphasizing the importance of medication adherence when providing counseling to TB patients.

Keywords: Tuberculosis; Anti Tuberculosis Treatment; Non-Adherence; Factors Associated

INTRODUCTION

Tuberculosis (TB) is a direct infectious disease caused by the mycobacterium tuberculosis germ which is the second highest cause of death in the world due to a single infectious agent, after the corona virus disease (COVID-19), which causes twice as many deaths as HIV/AIDS. Every year more than 10 million people continue to be infected with TB. It is estimated that a quarter of the global population has been infected by the mycobacterium tuberculosis germ. 90% of TB sufferers generally occur in adults, where cases are more in men than in women. TB germs usually attack the lungs and can also attack other organs of the body (1).

Indonesia is the country with the second highest number of TB cases in the world after India. Based on the estimated cases in 2023, which is 1,060,000 TB cases, there are 821,200 (77%) notification numbers. The death rate from tuberculosis is recorded at 134,000 and the number of drug resistance is 31,000 cases. The success of TB patient treatment has only reached 86% while the target is 90%. In 2021, the number of patients lost to follow up was 6.9% and in 2022 it increased to 7.1% (2).

One of the major challenges in TB control is non-adherence to anti-TB therapy. This is the main reason why TB treatment programs fail, and this results in high mortality rates, MDR-TB cases, expensive TB treatment costs, prolonged transmission, and other substandard TB treatment outcomes, as well as the spread of TB in the community. Patients with TB are expected to adhere to the treatment plan at a rate of more than 90% to facilitate cure or achieve good outcomes (3,4). Effective TB control efforts require patient compliance in taking medication, which involves complex problems in improving the quality of services for TB patients (5).

World Health Organization (WHO), in its global strategy to eradicate TB, notes that ineffective treatment has led to the emergence of strains of Mycobacterium TB that do not respond to treatment with conventional first-line anti-TB drug combinations, leading to the emergence of multidrug-resistant TB in almost every country in the world. (6). Non-adherence to TB treatment, if not addressed as a critical public health problem, will contribute to the transmission of drug-resistant TB, which is highly contagious and difficult to treat. Poor treatment outcomes, such as treatment failure, relapse, and high mortality rates, are all attributable to non-adherence to treatment (7).

A deeper understanding of the factors that influence non-compliance with medication in TB patients is needed to improve the success of treatment. This article is written to describe the factors that influence non-compliance with medication in TB patients in Indonesia. Based on the results of previous studies, it is hoped that a comprehensive understanding of the factors that influence non-compliance with medication in TB patients will emerge. In addition, recommendations can be obtained to improve medication compliance so that it can improve the success of treatment.

METHOD

This study uses literature review by collecting, selecting, extracting and reviewing scientific articles relevant to the research topic. The scope of this study is limited by the PICO framework (Population/Problem, Intervention, Comparison, Outcomes). The limitations of the research scope are presented in table 1.

Tabel 1. Framework PICO

Component	Information	Criteria	
		Inclusion	Eclusion
Population/ Problem	Non adherence for anti tuberculosis treatment	National / International Journals related to the research topic, namely factors associated for adherence anti tuberculosis treatment in 2021-2024 using quantitative research methods.	National / International Journals related to the research topic, in the form of SLR, LR, abstract.
Intervention	Factors Associated	Family support, socio demographics, drug side effects, educational status, smoking status	Factors are not associated for anti tuberculosis treatment.
Comparation	-	-	-
Outcome	Factors associated for anti tuberculosis treatment.	Non-adherence for anti tuberculosis treatment	TB patient fails treatment and dies

The steps in this study include creating research questions, searching for literature, selecting studies with eligibility and quality criteria, and conducting synthesis. The research question is what factors are related to medication adherence in TB patients in Indonesia. Literature search using Scopus, ProQuest, ScienceDirect databases. Article search was conducted using the keywords Factors associated, Adherence, Anti tuberculosis treatment. The weakness of this research method is the potential for bias in the selection of literature and the accuracy in concluding the results of different studies.

Selection of literature sources using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analysis). Article selection is done using eligibility criteria, namely inclusion and exclusion. The synthesis process is done by comparing literature that meets the quality assessment. Synthesis data refers to the purpose of this study, namely to determine the factors that influence medication adherence in TB patients. The last step is data extraction in the form of a matrix table.

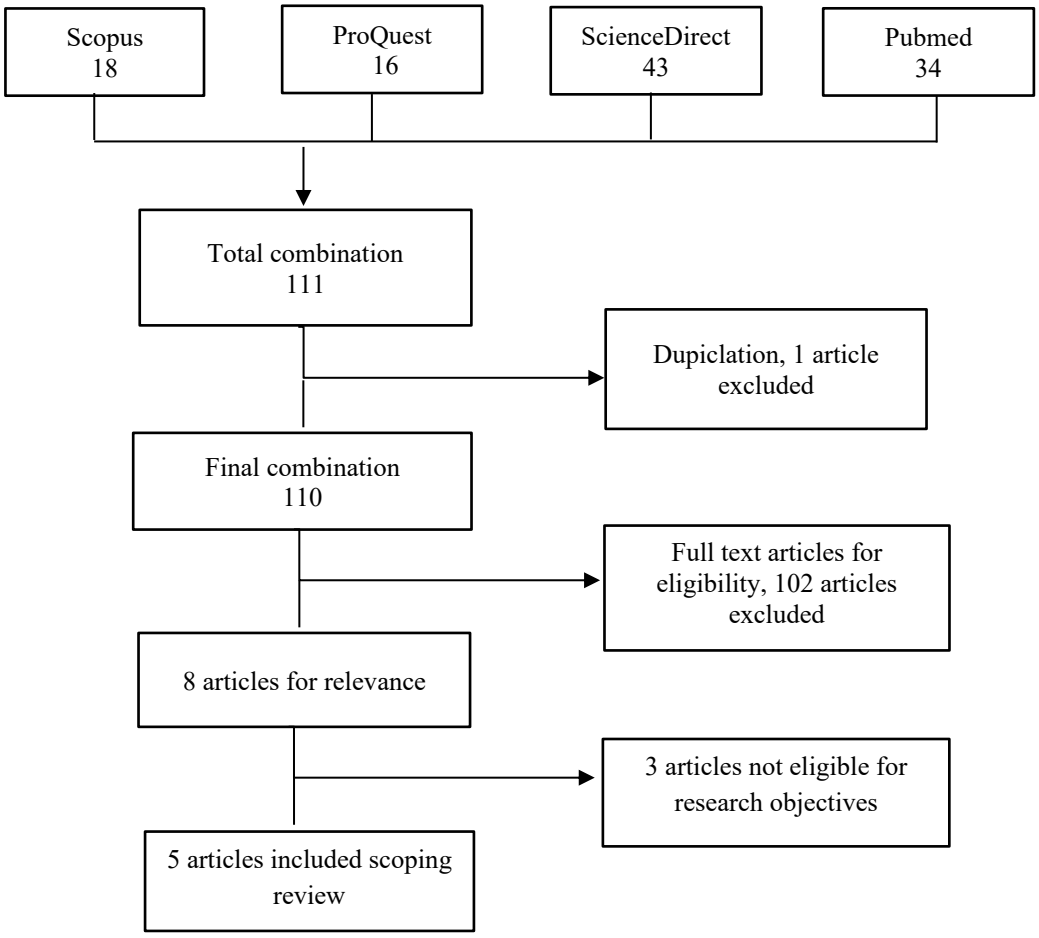

Figure 1. PRISMA Scientific Article

RESULTS

The results of the article search using Scopus, ScienceDirect, and ProQuest, Pubmed found 11 scientific articles. The next step is the removal of duplication and article titles and selection using inclusion criteria and exclusion criteria and found 8 relevant scientific articles. The article was assessed and reviewed by looking at the entire content and only 5 articles were appropriate.

Tabel 2. Scientific article data extraction

Researcher, Year	Article title	Journal, Vol, No	Research methods	Factors associated
Lire Lemma Tirore et al., (2022)	Non adherence to anti tuberculosis treatment and associated factors among TB Patients in public health facilities of Hosana Town, Shouthern Ethiopie.	Frontiers in medicine DOI 10.3389/fmed.2024.	Cross sectional studi	Educational status, Knowledge, Treatment phase, Family support.
Resom Berhe G et al., (2021)	Determinant of adherence to anti-TB treatment and assosiated factors among adult TB patients in Gondar city administration,	Journal of health, Population and	Cross sectional studi	Treatment support, Difficulty taking medication regularly, perceived benefits, perceived self-efficacy.

	Northwest, Ethiopia; Based on health belief model perspective.	Nutrition (2021) 40:49		
Dina Bisara Lolong et al., (2022	Non adherence to antituberculosis treatment, reason and associated factors among pulmonary tuberculosis patiens in the communities in Indonesia.	PLoS ONE 18(8)	Cross sectional studi	Smoking status, Place of initial treatment, Socio-demographic status, Education level, regional area, current TB status.
Shika Jaiswal et al., 2022	Non adherence to anti tubercular treatment during COVID-19 pandemic in Raipur district Central India.	Indian Journal of Tuberculosis 69 (558-564)	Cross sectional studi	Drug side effects, skipping medication on purpose, family support, not knowing the duration of treatment, not feeling changes, access to medication
Glory Ovunda W et al., 2022	Medication adherence among pulmonary tuberculosis patients in treatment centers in a Southtern Nigeria Local Government Area : Question Mark on Performance DOTS service.	Nigerian Medical Journal Volume 63 Issue 5	Cross sectional studi	Sputum production, history of previous treatment, patient's smoking status.

Based on the extraction results of scientific articles, it was found that variables related to compliance with taking medication in tuberculosis patients as in table 3.

Table 3. Factors associated for adherence anti tuberculosis treatment

Variabel	Non-Adherence		OR (95% CI)	P Value
	Yes	No		
Family support				
Yes	14.1%	85.9		0.026
No.	27.1%	72.9%	2.36(1.11-5.04)	
Gender				
Female	23.65%	76.35%		0.000
Male	30.09%	69.91	1.41 (1.18-1.68)	
Age (years)				
15-54	25.5%	74.50%		0.018
≥ 54	31.89%	68.11%	1.56 (1.05-1.67)	
Education				
High	22.34%	77.66%	1.43 (1.18-1.83)	0.004
Low	29.56%	70.44%		
Drug side effects				
Yes	77.9%	22.1%		0.025
No.	60.0%	40.0%	2.3 (1.1-4.9)	
Smoking				
Yes	16.7%	83.3%		0.012
No	67.9%	32.1%	7.779 (1.58-38.305)	

DISCUSSION

Tuberculosis treatment aims to cure patients, prevent death and prevent drug resistance. However, because the treatment period lasts for 6 months consisting of 2 months of intensive phase and 4 months of continuation phase, side effects arise and the need to take many different medications means that patients often do not comply with treatment. Non-adherence to treatment in tuberculosis patients is also a global problem. Indeed, apart from having an impact on drug resistance, disease recurrence and death, non-compliance can also have an impact on the economy, where the longer treatment lasts, the higher the costs that must be incurred. This can have an impact on the health care system (8). Non-adherence to taking medication is a challenge to end the TB epidemic.

Family Support for Adherence

Non-adherence for anti tuberculosis treatment is 3.10 times higher in patients who did not reveal TB status to their family (OR = 3.51, 95% CI: 1.15, 10.75). This could be because patients feel afraid of being discriminated against so they do not reveal their status to their family (4). The support received by the patient from those closest to him, especially from the family, can help ease the social and economic burden of TB patients. The family can also

play the role of monitoring medication swallowing and reminding the patient of the schedule for visits to health care facilities (9). The treatment of the family and partner can influence the patient's decision-making, whether to continue treatment or decide to stop treatment (10).

Sharing the situation becomes very important in undergoing TB treatment because patients will receive various forms of support that can help in drug adherence. Patients who receive support from their families can reduce psychological stress and financial burdens, especially in environments that implement an extended family system (11). Many patients reported that they were forced to seek support due to loss of income and physical exhaustion. Patients emphasized that any support, especially from family members, was an important factor in continuing their treatment (12)

Socio Demographic Status

Based on gender, non-adherence for anti tuberculosis treatment is 1.41 times riskier for men than for women (OR = 1.41, 95% CI: 1.18, 1.68). Men are the main breadwinners in the family so they leave the house more often to work and have difficulty complying with treatment. Furthermore, the age factor also influences non-compliance with taking medication in TB patients. Patients who are older (≥ 55 years) are 1.56 times more likely than young people (15-54 years) to be non-compliant with taking medication (OR = 1.56, 95% CI: 1.05, 1.67. Older patients tend to be less compliant with TB treatment due to physical weakness and taking on more responsibilities in the family (13).

The results of a literature search in another study conducted in Jayapura found that young age was significantly related to non-compliance with taking medication (14) Meanwhile, the results of a survey conducted in Bandung showed that there was no influence of age on medication compliance in TB patients (15).

Drug side effects

Patients who experience drug side effects are 1.7 times more likely to be non-adherence for anti tuberculosis treatment than patients without drug side effects (OR = 1.7, 95% CI: 0,40, 7,10). Side effects of the drug felt by patients include nausea, vomiting, stomach ache, lethargy, itchy skin rashes, headaches. The side effects caused by swallowing anti-tuberculosis drugs make it difficult for patients to comply with the regimen, so patients often skip or stop treatment (16).

The results of literature searches in other studies conducted in Selamata Ethiopia also found that drug side effects influenced non-adherence to treatment in TB patients (17). Drug side effects can be overcome if the patient consults a doctor, when the patient reports complaints of drug side effects, the doctor can provide advice and follow-up on complaints of side effects felt by the patient by changing the drug regimen that has been given to the patient previously. However, the low knowledge of patients about treatment causes patients to immediately decide to stop taking medication. Poor knowledge about TB treatment also affects non-compliance in taking medication.

Smoking Status

The results of the study showed that tuberculosis patients who smoked were 1.78 times more likely to be non-adherence to treatment (OR = 1.78, 95% CI: 1.47, 2.16).[18] This is different from the results of other research conducted in West Java which stated that there was no relationship between smoking and adherence to taking medication (19). Smoking can damage the lungs and reduce the immune response so that the response to tuberculosis treatment is less than optimal (20). Apart from that, smokers may think that coughing is normal for smokers. The results of literature searches in other studies conducted in India also found that patients who smoke had a higher risk of non-compliance with tuberculosis treatment. Smoking cessation programs are important for patients in treating tuberculosis. If the patient stops smoking, it is possible that the body's response to the drug will be better and this can have a good impact on the success of treatment for the patients.

Lower education

Patients with low education are 1.60 times more likely to be non-adherence foranti tuberculosis treatment than patients with higher education (OR = 1.60, 95% CI: 1.27, 2.03). This could be because TB patients who do not have formal education have more difficulty accepting directions regarding treatment given by health workers and have low awareness about the importance of compliance with taking medication according to established standards (13).

Patients who do not have formal education will have low knowledge so that the risk of non-compliance in undergoing treatment becomes higher. The results of a literature search in another study conducted in South Ethiopia also showed that patients who did not have formal education were more likely to be non-compliant in treatment. However, another study conducted in Nigeria found that there was no association between non-compliance in taking medication and the patient's educational status.

CONCLUSION

Non-adherence to taking medication is a challenge to end the TB Epidemic targeted by SDG'S and the End TB strategy in 2030 and 2035. Factors such as lack of family support, demographic status (male and older), lower education, drug side effects, Smoking status influences non-adherence to taking medication in TB patients. Interventions that target the importance of family support need to be carried out, in addition to the importance of health campaigns targeted at certain groups such as the elderly, men and smokers to increase TB knowledge which has an impact on TB treatment compliance. Increased counseling about drug side effects needs to be carried out when patients come to health care facilities and ask patients to submit complaints to the doctor if they experience drug side effects.

SUGGESTION

Suggestions for next researchers use literature with qualitative studies that explore more deeply the patient's experience in TB treatment. Apart from that, it examines more deeply the health service provider side, such as patient satisfaction with health services and the role of health workers in the treatment of TB patients.

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