



Systematic Literature Review



## Health Education and the Increase in TB Patient Medication Compliance

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### A B S T R A K

**Background:** Tuberculosis (TBC) is an infectious disease that worsens individual health and is the leading cause of death in the world. Long TBC treatment requires interaction from TBC sufferers who require intervention in medication adherence. Compliance is an important factor in TBC treatment, therefore WHO made DOT to monitor TBC treatment. One method that has been proven to have a positive effect is health education interventions to increase adherence to anti-tuberculosis treatment in TBC patients. Educational interventions are aimed at providing patient knowledge and understanding of the disease process and the risks and benefits associated with medication adherence

**Purpose:** To get an overview of how the health education model is used to improve adherence to taking anti-tuberculosis drugs in TBC patients

**Method:** writing using a Systematic Review with a literature search carried out in accordance with the preparation of research questions using the PICO formula. The data base used is Proques, Scoopus, Embase, Clinicalkey with articles used in full text with a publication period from 2018-2023

**Results:** There were 7 articles related to health education interventions on adherence to taking OAT in Tuberculosis patients.

**Conclusion:** Increasing the knowledge of TBC patients about TBC disease with health education can change the beliefs and perspectives of TBC sufferers towards the disease so that it can show increased adherence to taking antituberculosis drugs in TBC patients

## INTRODUCTION

Tuberculosis (TB) is an infectious disease that is one of the leading causes of death worldwide and a significant cause of ill health. TB disease is caused by the bacillus *Mycobacterium tuberculosis*, TB disease without treatment is estimated to increase mortality by 50%, and anti-TB medications recommended for 4-6 months can cure approximately 85% of TB patients [1]. Ministry of Health of the Republic of Indonesia (2014) states that the provision of anti-tuberculosis drugs (OAT) for the treatment of tuberculosis necessitates six months of effective and therapeutic therapy on the condition that the patient is compliant during the treatment period. According to the Indonesian Ministry of Health (2020), patient adherence to treatment for a continuous period of six months is a major factor in TB treatment efficacy. Noncompliance with anti-TB therapy can result in the unbridled spread of tuberculosis, adverse drug reactions, morbidity, and drug resistance. In addition, the unchecked spread of tuberculosis can result in substantial health costs and significant losses of human resources [4].

Public health programs have used a variety of strategies to increase adherence. The most common adherence intervention is Direct Observed Therapy (DOT), which refers to the act of observing the drug being swallowed by the patient. Educational

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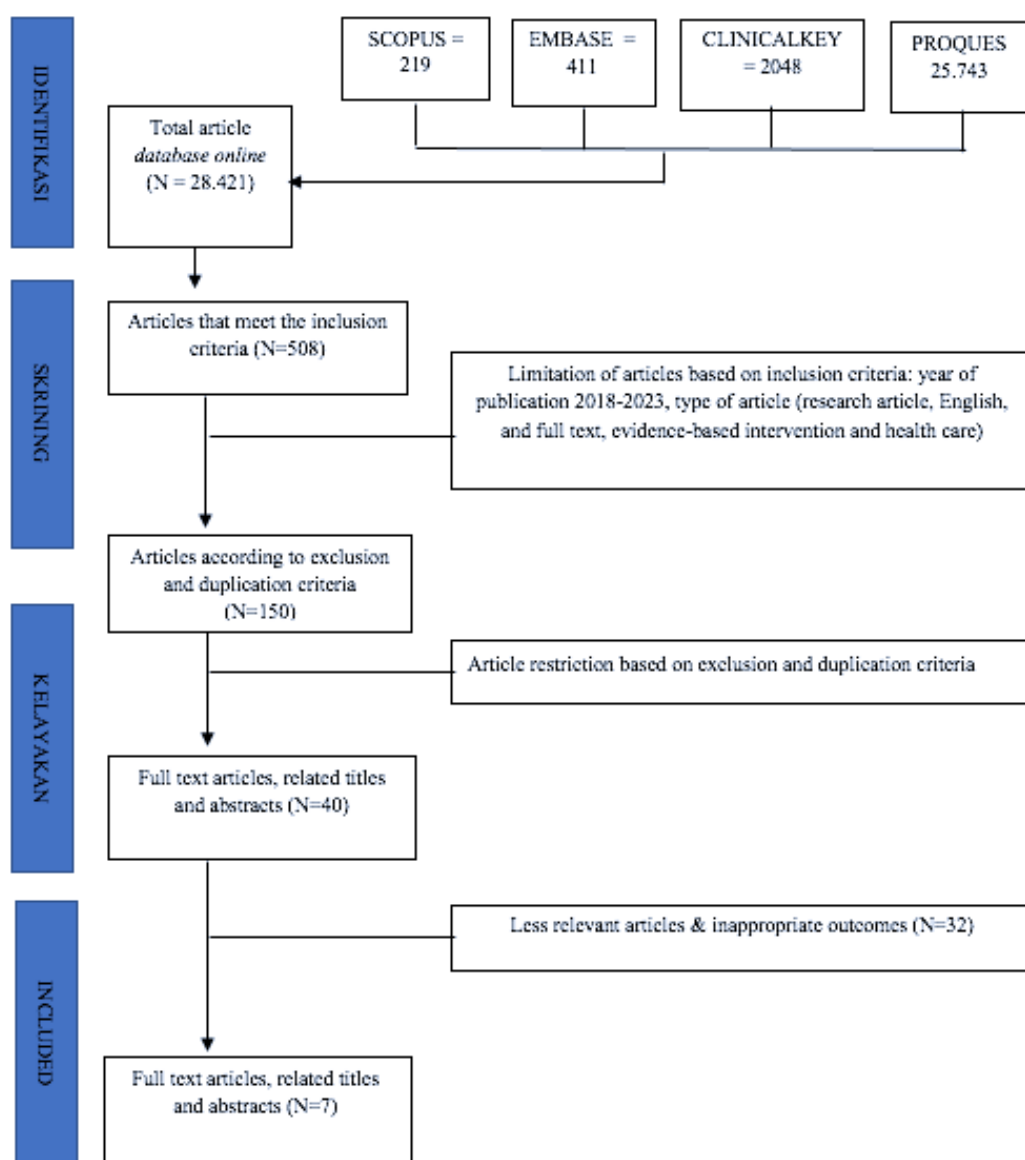
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and counseling interventions aim to increase patient knowledge of the disease process and associated risks. and benefits related to treatment compliance [5]. As part of treatment, TB education and counseling are universally recommended. Education about tuberculosis (TB) is an intervention designed to increase knowledge, attitudes, and behaviors in order to provide general information about TB and to elucidate treatment requirements. Counseling, meanwhile, is an intervention that provides individualized guidance in managing care and problem-solving skills to combat stigma, dread of side effects, and low self-efficacy. [6]

## METHOD

This research employs a systematic literature review (systematic review) methodology. Utilizing the PICO formula (Population/Problem, Intervention, Comparison, and Outcome), conduct a search of the scholarly literature using research queries. Utilize databases such as Scopus, Proquest, Clinicalkey, and Embase to search for articles. Search for articles with the search terms Health Education And Tuberculosis And Medication Adherence. The full-text articles used have a publication date range of 2018 to 2023. The selection of articles is governed by the PRISMA guidelines, which are outlined in scheme 1.



Schematic Flow Diagram for New Systematic Reviews: PRISMA 2020 [7]

The databases Scopus, Embase, ClinicalKey, and Proquest were queried for 28,421 research articles. According to the research objectives, seven articles were chosen after passing through various phases based on the PRISMA 2020 scheme. Selected articles were extracted and tabulated based on databases and journals, authors, place of research and year of publication, title, research objectives, research design, sample size and sample or participant characteristics, description of the intervention, length and frequency, duration, time to measure results, and results/conclusions. Description in table 1.

NO	Database	Author, place of research and year of publication	Title	Objective	Research Desain	Sample size and characteristics of the sample or participants	intervention	Length and frequency, duration	Outcome measurement time	Results/ conclusions
1	EMBASE	[8] Provinsi Hubei, Cina	Effectiveness of comprehensive social support interventions among elderly patients with tuberculosis in communities in China: a community-based trial	Menjelajahi intervensi yang efektif untuk meningkatkan dukungan sosial pasien sangat penting untuk manajemen dan pengendalian TBC.	a community - based trial	183 patients were included in the final analysis (61 in the intervention group and 122 in the control group) Characteristics a. diagnosed with tuberculosis b. >65 years, local resident, c. (d) registered with the NIDRS, (e) normal communication skills and d. (f) voluntarily participate in this research. Patients were excluded if they (a) had a mental health disorder, (b) has a cognitive impairment or (c) is enrolled in another study	Patients in the control group received the health education intervention alone, and those in the intervention group received psychotherapy and family and community support interventions in addition to health education.	This study lasted for 6 months with an intervention frequency of twice per month	Data were collected at baseline and in the first, third and sixth months after initiation of the intervention	Intervention programs in the community, including health education, psychotherapy and family and community support interventions, can increase social support for elderly patients with tuberculosis compared to health education alone.
2.	EMBASE	[9] Bandung, Indonesia	Educational counselling of patients with combined TBC and diabetes mellitus: a randomised trial	Describe the effect of educational counseling on patient knowledge about TB (transmission, treatment, risk factors) and DM (symptoms, treatment, complications, healthy lifestyle), medication adherence, and examine characteristics related to knowledge	a randomised trial	Respondents 108 of 150 patients were randomized (60/76 in the intervention group and 48/74 in the control group).  Patients aged >18 years from the two study populations: 1) DM patients 2) pulmonary tuberculosis patients	All patients received counseling about tuberculosis and DM prior to randomization according to standard patient care. control group, no other scheduled education was provided and their care was managed by their CHC	Structured education about TB and DM in patients in the intervention group changed their knowledge during the 6-month trial compared to the control group.	Questionnaires were completed by patients in both groups during randomization after the initial TB DM education was provided, and again at the 6-month follow-up visit.	Intensive and systematic counseling does not lead to increased knowledge of TB and DM. However, combined with more frequent monitoring and structured DM drug adjustments, structured education results in better DM drug intake
3	EMBASE	[6] Kampala, Uganda	Perceptions, preferences, and experiences of tuberculosis education and counselling among patients and providers in Kampala, Uganda: A qualitative study	Know how to provide effective, efficient, and patient-centred TB education and counselling (TEC) in low- and high-income HIV-TB burden settings	qualitative study	25 health workers And 37 TB patients  Health workers who work in HIV TB clinics, work > 1 year Active TB patient, fluent in English.	The HCW FGD guide included seven open-ended questions that explored participants' perceptions of TEC and their understanding of current practice	empat diskusi kelompok fokus (FGD) dengan petugas kesehatan yang berbasis di klinik TBC dan HIV, dan tujuh FGD dengan pasien TBC antara September 2017 dan Desember 2018		pengetahuan masyarakat mengurangi stigma TBC dan meningkatkan hasil pengobatan TBC. Peserta mengidentifikasi manfaat yang jelas dari TEC dan peluang untuk meningkatkan TEC di klinik TBC yang kekurangan sumber daya
4	PROQUES	[10] Negara Bagian Khartoum	Effectiveness of education intervention of tuberculosis treatment adherence in	merancang, melaksanakan, dan menilai intervensi pendidikan untuk	randomized control trial	146 pasien Kriteria : Pasien telah menjalani 1-2 bulan pengobatan	Kelompok intervensi akan diberikan intervensi edukasi tentang TBC, materi	Intervensi akan diberikan melalui empat sesi	Kelompok intervensi dan kontrol akan diikuti selama periode yang	Uji coba ini akan memberikan informasi yang dapat digunakan dalam meningkatkan

			Khartoum State: A study protocol for a randomized control trial	meningkatkan kepatuhan pengobatan TBC.		setuju mengikuti intervensi sampai akhir, berkomitmen untuk seluruh kegiatan, usia >18 tahun	Pendidikan berbasis HBM, Modul edukas rup kontrol. Anggota kelompok kontrol akan menerima perawatan perawatan standar rutin yang sama dengan kelompok intervensi, tetapi tidak akan menerima intervensi pendidikan apa pun selama penelitian.	lokakarya dua jam intervensi akan memakan waktu sekitar 30 menit untuk setiap sesi Diskusi 10 sampai 15 mnt kelompok intervensi akan dibagi menjadi kelompok-kelompok kecil yang terdiri dari 10 sampai 12 peserta	sama selama 4 bulan	strategi pengendalian TBC untuk mencapai hasil yang lebih baik dalam kepatuhan pasien terhadap pengobatan dan penyembuhan penyakit
5	PROQUES	[11] kota Porto Alegre, negara bagian Rio Grande do Sul, Brazil	Educational strategy intervention and remote supervision on the post-discharge management of tuberculosis diagnosed in the hospital: Randomized clinical trial	menilai dampak dari intervensi strategi pendidikan dan pengawasan jarak jauh pada manajemen pasca pulang dari kasus baru TBC yang didiagnosis di rumah sakit terhadap angka kesembuhan TBC.	Randomized clinical trial	169 pasien tuberkulosis baru terdaftar. Di antara mereka, 80 ditugaskan ke kelompok intervensi dan 89 ke kelompok kontrol	Fase I— Sebelum pasien pulang menyampaikan informasi dan materi edukasi tentang penyakit dan tentang pengobatan Setelah pasien pulang. Fase ini ditandai dengan panggilan telepon bulanan ke pasien selama masa pengobatan TBC Fase III— Setelah pasien pulang. Fase ini ditandai dengan kontak dengan klinik perawatan kesehatan primer setiap tiga bulan selama masa pengobatan	panggilan telepon bulanan ke pasien selama masa pengobatan TBC oleh anggota penelitian untuk mengevaluasi apakah mereka mematuhi panggilan pengobatan berlangsung selama 30 menit. tiga bulan selama masa pengobatan oleh anggota penelitian untuk memantau kemajuan pengobatan dan kepatuhan terhadap pengobatan	Pemantauan selama 6 bulan	Intervensi strategi edukasi dan pengawasan jarak jauh pada tatalaksana pasca pulang dari kasus baru TBC dengan diagnosis di rumah sakit memiliki pengaruh positif yang kecil terhadap angka kesembuhan. Kedua, tingkat kegagalan pengobatan telah menurun secara signifikan dengan intervens
6	SCOPUS	[12] kota Lima, Peru	Social Support, Quality of Care, and Patient Adherence to Tuberculosis Treatment in Peru: The Mediating Role of Nurse Health Education	mengevaluasi efek mediasi pendidikan pengobatan antara dukungan sosial, kualitas perawatan, dan kepatuhan pengobatan pada pasien TBC	studi cross-sectional	162 pasien TBC dewasa	Mengevaluasi pasien yang berobat di empat pusat kesehatan. pasien yang didiagnosis dengan tuberkulosis yang sensitif terhadap obat dan telah berkembang ke tahap 2		3 Januari dan berakhir pada 23 Oktober 2021	Hasil penelitian menunjukkan bahwa dukungan sosial dan kualitas pelayanan berpengaruh signifikan terhadap pendidikan kesehatan. Demikian juga, pendidikan kesehatan memediasi dukungan sosial dan kualitas perawatan untuk kepatuhan pengobatan yang lebih baik
7	SCOPUS	[13] Kota Ahmedabad	Counseling intervention improves treatment adherence among newly diagnosed drug sensitive Tuberculosis patients of Ahmadabad city – A mixed methods approach	menilai dampak intervensi konseling singkat melalui aktivis pendukung kepatuhan pengobatan (TASA) dalam meningkatkan kepatuhan pengobatan pada pasien TBC sensitif obat.	A mixed methods approach	Kelompok Intervensi Unit TBC kelompok control Asarwa 85 dan Unit TBC Danilimda 77  pasien TBC Paru yang sensitif terhadap obat yang baru didiagnosis selama periode referensi tiga bulan dari TU terpilih, yang bersedia memberikan persetujuan dan	intervensi konseling singkat menggunakan format konseling, 'The Cough-to-Cure Pathway'. <b>Konseling</b> diberikan dalam tiga tahap. Fase awal yaitu home based pada awal fase perawatan intensif, kedua fase telephonic on		selama Januari hingga Maret 2020 selama tiga bulan	Konselor NTEP yang berdedikasi (TASA) dapat membantu meningkatkan kepatuhan pengobatan dan dampak konseling fisik

						berusia di atas 15 tahun	going pada satu bulan perawatan dan ketiga fase penutup pada akhir fase intensif perawatan.			
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## RESULT DAN DISCUSSION

Failure of treatment and disease recurrence in tuberculosis (TB) patients are typically the result of noncompliance. This can result in protracted infections, an increase in transmission, drug resistance, and death. Although the causative microorganism for tuberculosis has been identified for more than a century, the disease remains a global health concern. [10] Diverse public health program strategies, including financial incentives, improved coordination and logistics surrounding the delivery of TB treatment, and training for health care providers, have been utilized to increase adherence to TB drugs. Directly observed therapy (DOT) is a prevalent intervention. It has been demonstrated that the use of adherence interventions, such as patient education and counseling, incentives, supports, psychological interventions, reminders and monitors, and digital health technologies, improves TB treatment outcomes.[ 14]

The tuberculosis treatment success rate is relatively low due to the high attrition rate, which leads to drug resistance and treatment failure. Health education is essential for tuberculosis patients in order to help them comprehend and accept their condition, which increases treatment adherence. [15]. Health education can bolster social support and facilitate increased recovery and treatment continuity. The quality of education facilitates the development of trust between clients and healthcare professionals for the purpose of achieving treatment success [12].

### Intervention models

Seven-article examination yielded the discovery of an educational model. Intervention programs in the community, such as health education, psychotherapy, and family and community support, can increase social support compared to health education alone. To communicate with and develop harmonious relationships with patients, health care professionals conduct residential visits. Simultaneously, family members and friends of the patients were encouraged to attend psychoeducational workshops to learn the basics of tuberculosis and to communicate their emotional distress [8].

In study [9], all patients received health education in addition to clinical monitoring and medication adjustment (intervention group), while the control group received only routine care. Every patient received health education and attendance monitoring at the study clinic. Investigate [13] concise health education interventions utilizing 'The Cough-to-Cure Pathway'. There are three levels of health education. The first phase is home-based at the beginning of the intensive care phase, the second phase is ongoing via telephone after one month of care, and the final phase is the concluding phase at the conclusion of the intensive care phase. The tuberculosis unit administers this health education.

Research on health education was conducted after a Health Belief Model (HBM), which focuses on assessing individual health behaviors by examining the perceptions and attitudes that a person may have towards illness and the negative outcomes of certain actions. Health education is conducted on tuberculosis patients following a doctor's appointment in a respiratory clinic. In a study conducted by [11] Health education and remote surveillance on post-discharge management of newly diagnosed cases of tuberculosis in the hospital with the goals of increasing adherence and cure rates, and secondarily reducing failure rates, adherence and cure rates were increased and failure rates were decreased. Using focus group discussions (FGDs), [6] conducted research on effective, efficient, and patient-centered TB education and counseling in HIV-TB burden settings.

### **Counseling Length**

Based on the results of a review of seven articles, it was determined that the duration of the health education based on the research lasted six months, with an intervention frequency of twice per month and lasted approximately thirty minutes per patient. According to studies conducted by Li et al., 2018, Koesoemadinata et al., 2016, and Müller et al., 2019, health education lasted six months and consisted of three 30-minute meetings. Both the intervention and control groups will be observed for four months, with each session lasting thirty minutes [10] [6]. The quickest health education was administered in a study [13] that lasted three months and consisted of three meetings. Patients with tuberculosis can increase their knowledge of their disease and become aware of the significance of taking their medication exactly as prescribed if they receive health education over the course of three months and three 30-minute sessions.

### **Counseling-friendly media/methods**

Counseling on patient knowledge of tuberculosis (transmission, treatment, risk factors) and diabetes mellitus (symptoms, treatment, complications, healthy lifestyle), medication adherence, and assessment of knowledge-related characteristics. Health education was provided using flip charts, and each patient was given a leaflet containing information on the recommended food type and quantity [9].

In studies, [10] educational interventions on tuberculosis medication adherence have been examined. Health Belief-based intervention model (HBM) instructional materials. The intervention incorporated modules based on each patient's perceived benefit, perceived inhibition, perceived vulnerability, perceived severity, perceived self-efficacy, and cues to act. Participants receive a booklet with information about tuberculosis, TB prevention and screening, TB treatment, medication adherence, and the TB adherence Action Plan.

Flip chart for effective, efficient, and patient-centered TB treatment in an HIV-TB burden setting. Tuberculosis and HIV health education using concise textual explanations and cartoons to cover the etiology and manifestations of TB disease, symptoms, transmission, testing, treatment and side effects, prevention, and HIV-TB interactions. At the time of TB diagnosis and treatment initiation, TB patients receive their first in-depth individual counseling session, whereas people living with HIV (PLWHA) receive individual and group counseling to increase knowledge and adherence in antiretroviral therapy clinics. [6]

### **Assessment Device**

Medication adherence in patients was measured using the Medication Adherence Rating Scale (MARS), a 10-item self-reporting instrument that describes three dimensions: medication adherence behavior, attitude to taking medication, and as well as negative side effects and attitudes towards treatment. The measuring instrument used is based on the results of article reviews in accordance with the findings of the research. Therefore, it is suggested that TB patients be evaluated using a MARS-based questionnaire.

### **Effects of Education on Health**

According to a review of articles on health education intervention programs, psychotherapy and family and community support interventions can increase social support, broaden community knowledge, reduce TB stigma and improve TB treatment outcomes, patient adherence to treatment and disease healing, social support and service quality have a significant impact on health education. The results of this study contradict the findings of [8] who concluded that structured education does not increase patient knowledge. It was associated with greater adherence to diabetes treatment, but this cannot be attributed solely to education. More effort is required to increase patient knowledge, particularly regarding diabetes. This study is consistent with the findings of Müller et al. (2019), who concluded that the intervention of remote education and surveillance strategies in the

post-discharge management of newly diagnosed cases of tuberculosis in hospitals has a minor effect on the cure rate. Second, with intervention, treatment failure rates have decreased significantly.

## CONCLUSION

Our review indicates that health education on OAT treatment adherence correlates with TB patients' medication adherence. In addition, this intervention can increase treatment efficacy, decrease psychological pressure or stigma, and increase patient knowledge. In TB treatment programs, health education interventions are prescribed for patients from initial diagnosis to completion of treatment.

It is suggested that health education be conducted once a week for thirty minutes, followed by discussion. After the health education presentation, there will be a ten- to fifteen-minute discussion period. It is recommended that, when conducting health education, media in the form of flip charts be used to increase the motivation and memory of participants in health education intervention activities, as they contain a summary of the subject matter that will be presented inside and participants are given booklets and modules. The Medication Adherence Rating Scale (MARS) was used to assess treatment adherence, and participants were also provided a diary to track their medication adherence.

## ANNOUNCEMENTS

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