ISRCTN89499814 https://doi.org/10.1186/ISRCTN89499814

Internet plus health education on treatment adherence in patients with pulmonary tuberculosis

Submission date
08/08/2025

Recruitment status
No longer recruiting

Registration date
11/08/2025

Overall study status
Completed

Last Edited
11/08/2025

Condition category
Respiratory

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
There have been relatively few clinical studies evaluating the application of the Internet plus health education model among patients with Pulmonary tuberculosis. Against this backdrop, our study investigated the effect of Internet plus health education on treatment adherence in patients with PTB, aiming to provide evidencebased guidance for nursing interventions in this population.

Who can participate?
Tuberculosis patients aged between 18 and 60 years

What does the study involve?
Health education for the control group was delivered by the primary nurse based on the standardized pulmonary tuberculosis education record.
Patients in the intervention group received a sixmonth Internet plus health education program.

What are the possible benefits and risks of participating?
Improve treatment adherence, enhance disease knowledge, and increase patient satisfaction among individuals.
No risks.

Where is the study run from?
Beijing Chest Hospital, Capital Medical University (China)

When is the study starting and how long is it expected to run for?
September 2024 to June 2026

Who is funding the study?
Beijing Tongzhou District Science and Technology Plan Project (KJ2023CX053)
Beijing Research Ward Excellence Program (BRWEP2024W042160116)

Who is the main contact?
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Contact information

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Study information

Scientific Title
Effect of Internet plus health education on treatment adherence in patients with pulmonary tuberculosis

Study objectives
The Internet plus health education model, delivered via a WeChat Mini Program, may improve treatment adherence, enhance disease knowledge, and increase patient satisfaction among individuals with PTB

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 21/07/2025, Ethics Committee of Beijing Chest Hospital, Capital Medical University (No. 9 Beiguan Street, Tongzhou District, Beijing, 101149, China; +86 10 89509134; zhangtongqun@sina.com), ref: LW-2025-022

Primary study design
Interventional

Study design
Single-center interventional randomized controlled trial

Study type(s)
Other

Health condition(s) or problem(s) studied
Treatment adherence in patients with pulmonary tuberculosis

Interventions
Participants were randomly assigned using a random number table to either the control group (n = 40) or the intervention group (n = 40).

Control Group
Health education for the control group was delivered by the primary nurse based on the standardized PTB education record form developed by the hospital's Nursing Department. Education was provided during hospitalization and at discharge, covering the following aspects:
1. For newly admitted patients and their families, explanation of hospital visitation policies, daily routines, the importance of smoking cessation, and fall prevention measures
2. Principles and proper methods of disinfection, isolation, and mask usage
3. Basic knowledge of PTB
4. Instructions on correct sputum collection techniques and associated precautions
5. Information on venous thromboembolism, including prevention and risk factors
6. Purpose, significance, and precautions related to specialized diagnostic procedures (e.g., bronchoscopy, CTguided biopsy) and interventions (e.g., lumbar puncture, thoracentesis)
7. Guidelines for the use of antituberculosis medications and possible ADRs
8. The relationship between diet, rest, and disease recovery
9. For discharged patients and their families: homebased disinfection and isolation protocols, medication adherence, recognition and management of potential ADRs, followup schedules, and important considerations for home care.

Intervention Group
Patients in the intervention group received a sixmonth Internet plus health education program, implemented as follows:
1. Establishment of Internet Plus Health Education Team: A multidisciplinary team was established, comprising one staff member from the Nursing Department, one head nurse from the tuberculosis ward, five primary nurses, and two network engineers. All team members possessed extensive experience in either PTB nursing management or information technology. The Nursing Department staff member was responsible for quality control; the head nurse oversaw the evaluation of health education outcomes; the primary nurses were tasked with delivering online health education, handling patient inquiries, and collecting and managing data; the network engineers were responsible for developing and maintaining the Internet plus health education platform. All team members underwent standardized training on platform usage and passed a competency assessment. Regular feedback meetings were held to address implementation challenges and drive continuous quality improvement.
2. Development of Internet Plus Health Education Content: Based on patient needs and grounded in the knowledge, attitude, practice (KAP) theoretical framework, the team consulted five experts from different domains to develop a structured and practical health education program. The program consisted of three major modules:
A. PTB knowledge education, including guidance on basic disease information, diagnostic procedures, treatment options, medication use, and lifestyle recommendations
B. Belieforiented education, including psychological support, family support, and social support
C. Behavioral education, including instructions on disinfection and isolation, followup routines, behavior tracking, and functional rehabilitation. The authority coefficient of the expert panel was 0.92, and the final educational framework was deemed standardized, practical, and feasible.
3. Development and Implementation of the Internet Plus Health Education Platform: The platform consisted of three functional interfaces: a system management terminal, a healthcare

provider terminal, and a patient terminal.
A. System Management Terminal: This interface supported the overall configuration and operation of the platform, including system setup, healthcare staff management, patient management, health education administration, patient inquiries and communication, and push notifications. It was responsible for platform maintenance and technical updates.
B. Healthcare Provider Terminal: This interface included modules for patient record management, health consultations, information dissemination, and health followup. Primary nurses used the platform as a new media tool to deliver patientcentered care. In the patient record management module, nurses created and maintained individual health profiles. In the health consultation module, nurses responded to patient queries within 12 hours. The information dissemination module delivered electronic educational materials (including text and images) based on the structured Internet plus health education content, allowing patients to access information at any time. The health followup module was used to send automated appointment reminders to patients' mobile phones three days prior to scheduled followup visits, as determined at the time of discharge.
C. Patient Terminal: The patient interface included modules for health records, health education, health consultation, and peer communication. Patients could access educational materials pushed through the health education module; submit inquiries based on their individual need.

Intervention Type
Behavioural

Primary outcome(s)
1. Adherence was measured via outpatient followup cognitive assessment. Followup behavior was categorized into three types: ontime followup, delayed followup, and no followup
2. Patient knowledge of pulmonary tuberculosis measured using a modified version of the Core Information and Key Knowledge Points for Pulmonary Tuberculosis Prevention and Control Assessment Questionnaire after six months of intervention
3. Patient Satisfaction measured using a satisfaction questionnaire after six months of intervention

Key secondary outcome(s)
There are no secondary outcome measures

Completion date
27/06/2025

Eligibility

Key inclusion criteria
1. Aged between 18 and 60 years
2. Confirmed diagnosis of PTB according to standard diagnostic criteria
3. Absence of other serious physical or psychiatric comorbidities
4. Ability to communicate effectively with study personnel
5. Proficiency in using a smartphone
6. Residence within the Beijing metropolitan area
7. Provision of written informed consent

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Upper age limit
60 Years

Sex
All

Total final enrolment
80

Key exclusion criteria
1. Critically ill status due to PTB
2. History of severe psychiatric disorders or cognitive impairment
3. Refusal to participate in the study

Date of first enrolment
01/10/2024

Date of final enrolment
30/11/2024

Locations

Countries of recruitment
China

Study participating centre
Beijing Chest Hospital, Capital Medical University
No. 9 Beiguan Street, Tongzhou District
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Sponsor information

Organisation
Beijing Chest Hospital, Capital Medical University

Funder(s)

Funder type
Government

Funder Name
Beijing Tongzhou District Science and Technology Plan Project (KJ2023CX053)

Funder Name
Beijing Research Ward Excellence Program (BRWEP2024W042160116)

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and/or analyzed during the current research are not expected to be available for privacy reasons.

IPD sharing plan summary
Not expected to be made available