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PRACTICUM REPORT

By

Dr. Aditi Bakshi

Cohort-01

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Under the Guidance of

Dr. Nutan Prabha Jain

Professor and Director, Centre for Gender Studies,

IIHMR University, Jaipur

&

Dr. K.K. Chopra

Director

New Delhi Tuberculosis Centre

State TB Training & Demonstration Centre

CERTIFICATE BY FACULTY ADVISOR

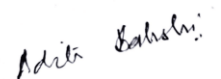
This is to certify that the dissertation titled “*Factors Associated with Acceptability of TB Preventive Therapy Among Household Contacts of Pulmonary TB patients in Delhi*” is a record of Research work undertaken by Dr. Aditi Bakshi, Enrolment No. IIHMR-U/16/2022-24/0001 in partial fulfilment of the requirement for award of the degree **Master of Public Health (Implementation Science)** from IIHMR University, Jaipur, India under my guidance and supervision and his/ her approach to research study has been sincere, scientific and analytical.



Dr. Nutan Jain
Professor
IIHMR University, Jaipur

CERTIFICATE BY SCHOLAR

This is to certify that the Practicum Project titled **“Factors Associated with Acceptability of TB Preventive Therapy Among Household Contacts of Pulmonary TB patients in Delhi”** submitted by me, Aditi Bakshi, with Enrolment No. **IIHMR-U/16/2022-24/0001**, under the supervision of **Dr. Nutan Prabha Jain, Professor and Director, Centre for Gender Studies, IIHMR University, Jaipur, India** for award of Master of Public Health (Implementation Science) conducted between **October 2023 and October 2024** is entirely my own and has not been submitted as the basis for any degree, diploma, fellowship, associate membership, title, or equivalent at this or any other university or institution of higher education.



Dr. Aditi Bakshi

MPH (IS) Cohort 2022-24

Certificate from the Organization



Dr. Alok Mathur
Addl. DDG (TB)
Central TB Division



सत्यमेव जयते



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Department of Health and Family Welfare
Ministry of Health and Family Welfare

F. No. A-66013/11/2018-TB

Date: 18th July 2024

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Aditi Bakshi, a student of IIHMR University, Jaipur, has satisfactorily completed her internship – from 01st January 2024 to 30th June 2024 at the Central TB Division, Ministry of Health and Family Welfare, Government of India.

During the period of her internship, she was punctual, regular and adhered to the rules and regulations of the Division.

Best wishes for her future endeavors.

(Dr. Alok Mathur)
Addl. DDG (TB)

टीबी हारेगा, देश जीतेगा / TB Harega, Desh Jeetega

Room No. G-9, Ground Floor, Jeevan Vihar Building, No. 3, Parliament Street, New Delhi - 110 001
Tel. : (O) 011-21400798, E-mail : mathura@mtcp.org

Abstract

Background: Tuberculosis (TB) continues to be a major public health issue in India, where the country contributing 29% of the global burden. Addressing TB Infection (TBI) is crucial for achieving TB elimination, and Tuberculosis Preventive Therapy (TPT) is a key intervention for inhibiting the progression of latent TB to active disease. However, the acceptability of TPT among Household Contacts (HHCs) of patients of Pulmonary TB (PTB) is understudied, particularly in the Indian context.

Objectives: This study aimed to investigate the factors influencing the acceptance and rejection of TPT among HHCs of microbiologically confirmed drug-susceptible PTB (SD PTB) patients in Delhi, and to understand how these factors affect the initiation, continuation, and completion of TPT.

Methodology: A descriptive cross-sectional study was conducted across six National Tuberculosis Elimination Program (NTEP) districts in Delhi. A sample of 390 HHCs aged 18 years and above who initiated TPT between January 2023 and May 2024 was selected through systematic random sampling. The data were gathered through a structured interview schedule and analysed using both descriptive and inferential statistics, including chi-square analysis.

Results: The study found that the acceptability of TPT was influenced by several socio-demographic factors, including age, gender, marital status, type of residence, and duration of stay at the current address. Socioeconomic status, particularly household income and occupation significantly impacted TPT initiation, dropout, and completion rates. Stigma related to TB, both from neighbours and internalized by participants, was a significant barrier to TPT acceptability. Knowledge about TB and TPT was also associated with higher acceptability rates.

Conclusion: The study identified key factors influencing the acceptability of TPT among HHCs in Delhi, including socio-demographic, socioeconomic, and stigma-related factors. Addressing these barriers through targeted interventions could enhance the uptake and completion of TPT, contributing to the broader goal of TB elimination in India.

Keywords: Tuberculosis Preventive Therapy, Household Contacts, Pulmonary Tuberculosis, Acceptability, Socioeconomic Factors, Stigma, Delhi

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Abbreviations

3HP- Three-month weekly Rifapentine and Isoniazid Regimen

6H - Six-month daily Isoniazid Regimen

COVID-19 - Coronavirus Infectious Disease 2019

DALY - Disability Adjusted Life Years

EPTB - Extra Pulmonary TB

GoI - Government of India

HHCs - Household Contacts

IGRA - Interferon Gamma Release Assay

IP- Intensive Phase

IRB - Institutional Review Board

LRS - Lala Ram Sarup (TB hospital)

MoHFW - Ministry of Health and Family Welfare

Ni-kshay - A government of India initiative to track TB patients

NSP - National Strategic Plan

NTEP - National Tuberculosis Elimination Program

OR- Odds Ratio

PHIs - Public Health Institutions

PLHIV - People Living with Human Immunodeficiency Virus

PMTPT - Programmatic Management of Tuberculosis Preventive Therapy

PTB - Pulmonary Tuberculosis

S & T - Screen and Treat

SEAR- Southeast Asia Region

SPSS - Statistical Package for the Social Sciences

T & T - Test and Treat

TB - Tuberculosis

TBI - TB Infection

TFA - Theoretical Framework of Acceptability

TNF - Tumour Necrosis Factor

TPT - TB Preventive Therapy

TST - Tuberculin Skin Test

UNHLM - United Nations High-Level Meeting

WHO - World Health Organization

Introduction

Tuberculosis (TB) is a contagious disease caused by the bacillus *Mycobacterium tuberculosis*, primarily impacting the lungs. It is transmitted via the air when individuals who are infected individuals cough, sneeze, or saliva (1). TB can take different forms- from subclinical with no symptoms to clinical with active symptoms. Clinical symptoms may not manifest in every TB-infected person unless the infection progresses to an active state. When there is an ongoing immune reaction to antigens of *Mycobacterium tuberculosis*, with no apparent clinical manifestation of active TB, it is known as TB Infection (TBI) (2). Various factors, including inadequate nutrition, insufficient ventilation, smoking, and other immunodeficiency diseases, play a critical role in the transition from a latent infection to the development of active TB disease.

TB is the subsequent-leading cause of global mortality from a single infectious agent after Coronavirus Infectious Disease 2019 (COVID-19) (3). Worldwide, the incidence is 134 per 100,000 population, causing an estimated 1.6 million deaths in 2021 (4,5). Globally, TB accounts for 122 million disability-adjusted life years (DALY), with the Southeast Asia Region (SEAR) contributing 45% of cases and 50% of deaths (6). India, a major contributor of TB cases in SEAR, has an incidence rate of 171, prevalence of 316, and mortality rate of 16 per 100,000 population, representing 29% of the global burden according to the Global TB Report (2023) (7). India's DALY for TB is nearly 15 (8).

Furthermore, addressing TBI also poses a significant obstacle to achieving elimination due to the potential for the advancement of the disease commencing from latency to active TB infection. According to research conducted in 2019, the worldwide prevalence of TBI is reported at 23.67% (9). Furthermore, the Southeast Asia Region (SEAR) constitutes the second-largest contributor to the global prevalence of TBI, standing at 26.46% (crude standardized rate), while at the national level, the pooled prevalence of TBI is approximately 41% (9–11).

Focusing on the substantial population at risk of developing TB, the WHO has outlined three key pillars for attaining elimination goals. The first pillar focuses on providing integrated, patient-centric care and prevention, emphasizing early detection, treatment,

and prevention for all individuals affected by TB (12). Consequently, the prevention of disease progression emerges as a pivotal aspect in managing TBI.

India has an optimistic aim to eliminate TB by the year 2025, which is five years ahead of the SDG. The National Strategic Plan (NSP) of India for 2017-25 underscores the importance of three core strategies: “DETECT, TREAT, PREVENT, BUILD” to achieve elimination (13). The Prevent pillar places significant importance on TB Preventive Therapy (TPT) over the years. TPT emerges as a multifaceted intervention that not only benefits individuals by preventing active TB but also addresses broader public health, economic, and societal considerations. Its impact extends to vulnerable populations and aligns with global aspirations for a TB-free world.

According to the findings of the India TB Report 2023, nearly 400 million individuals are infected with TB, with approximately 2.6 million expected to develop TB within a year (14). Considering the significant population at risk in India, it becomes imperative to prevent the progression of TBI into active TB. Thus, strengthening TPT through a ‘cascade of care’ approach is a crucial step (15). In this strategy, the identification of active TB is essential in the at-risk population, especially high-risk groups, through systematic screening. Subsequently, TPT is provided to individuals identified with TB Infection (TBI) (16).

Based on the data from WHO indicators, only 22% of house hold contacts (HHCs) with bacteriologically confirmed TB cases are undergoing TPT (17). However, factors that potentially contribute to the acceptability of TPT is an understudied area, especially in Indian context.

Table 1: Overview of TB and TBI

Topic	Details
Disease Overview	Mycobacterium tuberculosis, the pathogen that causes tuberculosis, is communicable and mostly affects the lungs. It travels via the atmosphere.
Forms of TB -	Subclinical: No symptoms Clinical: Active symptoms like cough, weight loss, night sweats, haemoptysis, etc

TB Infection (TBI)	Immune response to antigens of Mycobacterium tuberculosis in the absence of clinical signs of active tuberculosis.
Transition Factors	Inadequate nutrition, insufficient ventilation, smoking, immunodeficiency diseases.
Global Impact	Second-leading cause of global mortality from a single infectious agent after COVID-19 Incidence rate: 134 per 100,000 population 1.6 million deaths in 2021 122 million DALY
Regional Impact	SEAR: 45% of cases, 50% of deaths India: Incidence rate 171, Prevalence rate 316, Mortality rate 16 per 100,000 population India's DALY for TB: nearly 15.
TBI Prevalence	Global: 23.67% SEAR: 26.46% India: 41%
WHO Elimination Goals	Integrated, patient-centric care and prevention Emphasis on early detection, treatment, and prevention.
India's TB Elimination Goal	Eliminate TB by 2025
National Strategic Plan (NSP) 2017-25	Core strategies: DETECT. TREAT. PREVENT. BUILD.
India TB Report, 2023	400 million individuals infected 2.6 million expected to develop TB within a year.
Cascade of Care Approach	Identification of active TB in at-risk population through systematic screening. Provision of TPT to individuals with TBI.
Current TPT Coverage Rate	22% of HHCs with bacteriologically confirmed TB cases are undergoing TPT.

Research Question and Objectives of the study

Research Questions

1. What are the potential factors that influence the acceptance and rejection of TPT among HHCs of microbiologically confirmed drug-susceptible pulmonary TB (DS PTB) patients?
2. How do the identified factors affect the TPT engagement?
3. What could be alternative evidence-based strategies to enhance treatment uptake?

Objectives

Primary Objectives:

1. To investigate factors influencing the acceptance and rejection of TPT among HHCs of microbiologically confirmed DS PTB patients
2. To understand how these factors affect the initiation, continuation, and completion of TPT among HHCs across different subgroups.

Secondary Objectives:

1. To examine the relationship between socio-demographic factors (e.g., age, gender, role), socioeconomic factors (e.g., income, education level), social stigma related to tuberculosis, knowledge and accessibility to treatment about tuberculosis and TPT with the acceptability of TPT among HHCs.
2. To study key enabling and hindering factors associated with acceptability of TPT among HHCs of PTB patients
3. To suggest evidence-based recommendations to enhance the acceptability and uptake of TPT among HHCs.

Literature Review

A "state of persistent immune response to stimulation by *M. tuberculosis* antigens with no evidence of clinically manifest active TB" is the definition of TBI. (18). TBI is predominantly acquired through direct contact with a person diagnosed with pulmonary TB, often within a household setting (19).

Approximately 25% of the global populace has TBI and almost half a million under five children are eligible for TBI treatment whereas in India, based on the results of national prevalence survey 2019-21, population aged 15 years and more has a crude prevalence rate of 31.3% (20–22).

Given the considerable population size at risk, preventing TBI to progress into active TB is critical to reducing the disease burden. In reference to the latter, WHO issued “The End TB strategy” with a vision of achieving the same by 2030. The strategy emphasises the importance of preventive treatment for high-risk group as one of the key components (12). In order to decrease the probability of development of TB disease in HHCs, WJO suggests administering TPT post ruling out active TB status (23).

TPT is a universally recommended strategy for all HHC contacts. To administer TPT, a “cascade of care approach” has been adopted: the target population (people at risk of developing TB) is reached out and screened for TB; once active TB is ruled out through symptomatic screen in children under 5 years of age, TPT is given without TBI testing whereas in HHC more than five years old and adults, chest X Ray and any available TBI test is conducted, and patient is started on TPT (14,24). Tests are conducted to map for drug resistance in adults and to curate unique, individual specific testing. Moreover, non-testing prior to TPT treatment can also lead to drug resistance in the future. Currently recommended tests for TBI are Tuberculin Skin Test (TST) and Interferon-Gamma Release Assay (IGRA) and CY-TB based on the availability (14).

According to the WHO’s operational guidelines issued for TPT (2020), all HHCs who were exposed to Pulmonary TB (PTB) patients should be administered TPT in order to reduce TB incidence, without a mandate for prior LTBI testing except for special groups such as patients on dialysis, silicosis, or patients on anti-TNF alpha treatment, etc (21,25).

In alignment with the goals of WHO, Government of India (GoI) issued the first draft for National Strategic Plan in 2017, which states three major pillars to combat TBI in India – DETECT. TREAT, PREVENT, BUILD. Under the “Prevent” strategy, various interventions have been firmly discussed that reflect the importance of testing and treating TBI to reduce the TB disease burden (13).

In 2017, India introduced and implemented the Isoniazid Preventive Therapy (IPT) targeting People Living with HIV (PLHIV) and children those of age less than 6 years (13). Subsequently, in August 2021, the guidelines for the Programmatic Management of Tuberculosis Preventive Treatment (PMTPT) were published (14). These guidelines expanded the target audience for the six-month daily Isoniazid regimen (6H) from solely PLHIV to include HHCs of both less than 5 years and 5 years or older, as well as other high-risk populations comprising seven subgroups, such as patients with silicosis and individuals on immunosuppressive therapy (14).

The PMTPT guidelines also introduced a "screen and treat" (S & T) policy for PLHIV and children of age less than 5 years. For other individuals and those of age 5 years and more and those with conditions like silicosis, on anti-tumour necrosis factor (TNF) treatment, dialysis patients, and those preparing for solid organ transplantation, both "screen and treat" (S & T) and "test and treat" (T & T) strategies were considered (26).

Findings from the National TB Prevalence Survey (2019-2021) revealed that only 31.2% of people had latent TB infection (LTBI) status. As a result, from 2021 to 2024, 194 districts were selected by the Global Fund (GF) to implement the T & T model. This initiative was supported by the International Union Against Tuberculosis and Lung Disease (The Union) in 10 districts, the Clinton Health Access Initiative (CHAI) in 10 districts, and FIND in 2 districts (27,28). Official reports from these organizations are forthcoming.

Given the challenges associated with long-duration treatments, a new regimen known as the three-month weekly Rifapentine and Isoniazid (3HP) has been introduced as a shorter alternative to the 6H regimen (13). Additionally, corresponding to new guidelines issued in 2020, for high burden countries, Additionally, WHO guidelines issued in 2020 for high-burden countries recommend a one-month combination of Rifapentine and Isoniazid (21).

This regimen appears promising in terms of treatment adherence and minimizing the risk of drug resistance.

In India, the 3HP regimen was piloted and demonstrated promising results (29). Currently, the 3HP regimen is being scaled up in India, along with the deployment of AI-enabled handheld X-ray devices (30–32).

It's encouraging to note that TBI assessments have been carried out for 73% of children under 5 years old and for 77% of individuals aged 5 and above, with 59% of the younger group and 21% of the older group initiating TPT, we are witnessing strides in implementing therapeutic interventions, which are crucial for improved outcomes and recovery in TBI cases. These findings underscore the positive impact of targeted healthcare strategies in addressing TBI across different age demographics. (7).

Studies across various regions highlight several key enablers and barriers to the effective implementation and adherence to Tuberculosis Preventive Therapy (TPT). In Pakistan, successful TPT implementation was facilitated by establishing focal points at TB care centres for immediate patient contact and effective communication between Directly Observed Treatment Scheme (DOTS) facilitators and hospital management (33). Similarly, in South Africa, favourable healthcare worker attitudes, strong partnerships, and a dedicated TB nursing team were identified as critical factors for sustained program effectiveness (34).

In Delhi, India, factors facilitating early TPT implementation included enhanced education and awareness programs, free medication, and perceived treatment benefits from the patient's perspective. Providers noted that prior experience with Isoniazid Preventive Therapy (IPT), effective reminders, and active community engagement were essential for smooth implementation (19).

However, adherence to TPT remains suboptimal, particularly among adults. Contributing factors include a lack of knowledge, the lengthy duration of the regimen, and socio-economic challenges. For example, a study on IPT acceptability found that high acceptability was linked to perceived effectiveness and appropriateness, whereas interventions perceived as ineffective or burdensome, such as the influenza vaccine in Canada, faced lower acceptability (38). Socio-economic barriers, side effects,

misunderstanding of preventive roles, inefficient health services, poor communication, financial burdens, and competing priorities were identified as significant challenges (35,36).

In Nigeria, socio-demographic factors like marital status, education, and socio-economic status influenced treatment completion rates. Conversely, in rural South Africa, gender was a significant predictor of treatment completion, while a study in India found that age was the only socio-demographic variable significantly associated with TPT completion rates (29,41,42). A study in Zimbabwe highlighted that limited knowledge of TPT affected acceptability, suggesting that improved knowledge correlates with higher acceptance (43,44).

Challenges identified in Maharashtra, such as time constraints, distance, transportation issues, wage loss, and insufficient human resources, were significant factors leading to dropout before TPT initiation. Given these findings, additional research focusing on acceptability dimensions and beneficiary perspectives is needed to address the constraints and enhance TPT adherence.

Theoretical Framework of Acceptability (TFA)

Acceptability plays a pivotal role in the multifaceted process of healthcare intervention, encompassing its design, planning, and implementation stages). According to the insights presented (2009), the acceptability of any treatment modality is intricately linked to patients' feelings and their perceptions of the intervention (37). A comprehensive framework for assessing the acceptability of new or old interventions has been elucidated comprising seven distinct constructs (38)-

1. **Affective attitude-** This pertains to the emotional response elicited in individuals towards the intervention, encapsulating their subjective feelings about its necessity or dispensability for their well-being (e.g., how person perceive the importance of TPT).
2. **Burden-** Encompassing the efforts and commitments demanded from patients to engage in the intervention, this construct delves into the perceived burden

associated with adhering to the prescribed regimen (e.g., how much efforts it takes to accept TPT).

3. **Ethical consequences-** Evaluating the alignment of the intervention with the ethical values and beliefs of the patient, this construct explores the perceived ethical implications, including concerns related to potential side effects of the intervention (e.g., how they feel whether it is a fair intervention or not).
4. **Intervention Coherence-** Focusing on the clarity and understanding of the intervention, this construct gauges the extent to which patients comprehend the nature of the intervention, including its mechanisms and functionality (e.g., patients' understanding of TPT and why it is necessary).
5. **Opportunity costs-** This construct scrutinizes the perceived benefits that the intervention offers to the patient, contemplating the trade-offs and advantages associated with participation (e.g., what all they must give up taking TPT).
6. **Perceived effectiveness-** Assessing the perceived efficacy of the intervention, this construct delves into the extent to which individuals believe that the intervention will successfully fulfil its intended purpose (e.g., would they believe TPT protect you from TB).
7. **Self-efficacy-** Focusing on the individual's confidence in their ability to actively engage in the intervention, this construct explores factors such as commitment and the potential for dropout (e.g., evaluating the self-efficacy of patients in adhering to TPT and the risk of dropout).

The TFA served as the conceptual lens in this study through which the evaluation of the acceptability of TPT was conducted (38,39). This structured approach ensured a rigorous and systematic examination of the acceptability dynamics inherent in the intervention.

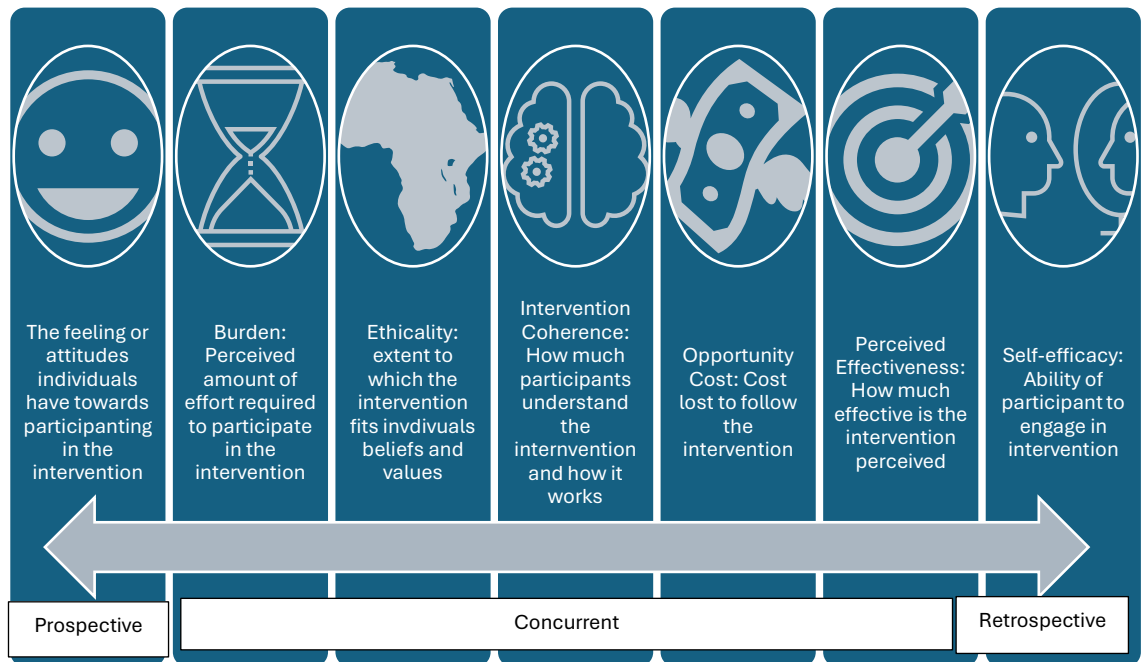


Figure 1: Theoretical Framework of Acceptability

Quantifying Acceptability in Health Intervention

Several studies have assessed the acceptability of interventions using adherence and completion rates as key metrics.

For instance, a study on an online program for depression measured acceptability through module completion rates, while a web-based intervention for pain management evaluated adherence by tracking the completion of intervention modules (40,41).

Similarly, mobile cognitive therapy for depression and a mHealth intervention for systemic lupus erythematosus used final module completion and retention rates, respectively, as indicators of acceptability (42,43).

Additionally, the acceptability of smart oral multidose dispensing systems and various blood pressure measurement methods was gauged by adherence and task completion rates (44).

In community-based interventions, such as a 6-month pedometer diary program and Isoniazid preventive therapy among HIV-infected patients, adherence rates were crucial in determining the interventions' acceptability (45,46).

Table 2: Literature Review: A Snapshot

Year of study	Title	Author(s) and reference or link	Key objectives	Key points of methodology	Key results
2024	“Situation Analysis of Early Implementation of Programmatic Management of Tuberculosis Preventive Treatment among Household Contacts of Pulmonary TB Patients in Delhi India”	“Alvi Y, Philip S, Anand T, Chinnakali P, Islam F, Singla N, et al. Tropical Medicine and Infectious Disease. 2024 Jan;9(1):24.”	To examine the initial implementation of programmatic management of TB preventive treatment among household contacts in Delhi.	Situation analysis of early implementation practices	Detailed the early implementation outcomes and identified barriers in programmatic management of TB preventive treatment
2024	Guidelines for Programmatic Management of Tuberculosis Preventive Treatment in India	World Health Organization	To provide guidelines for the programmatic management of TPT in India.	Detailed guidelines and procedures for managing TPT programs.	Structured approach to implementing TPT in various settings
2024	Approaches for TPT implementat	Knowledge Base (https://ntep.in/node/784/CP-approaches-tpt-implementation)	To describe various approaches for implementing TB preventive treatment	Review of different implementation approaches	Provided insights into the effectiveness of various implementation strategies
2023	Implementation of tuberculosis preventive therapy with INH-Rifapentine (3HP) for latent tuberculosis infection management in household	Sharma N, Bakshi R, Basu S, Zode M, Arora R, Khanna A. Tropical Medicine & International Health. 2023;28(12):890–900	To assess the implementation of INH-Rifapentine therapy for managing latent TB infection among HHCs in India	Prospective study on HHCs receiving INH-Rifapentine therapy	Highlighted the effectiveness and challenges in the implementation of INH-Rifapentine

	tuberculosis contacts in India: A prospective study				therapy for TB prevention
2023	Latent Tuberculosis in India: An Overview	Vishwakarma D, Bhoi SR, Rannaware A. Cureus [Internet]. 2023 Mar 2 [cited 2023 Sep 1]. Available from: Cureus article	To provide an overview of latent tuberculosis in India	Review of existing literature and data on latent TB in India	Discussed the prevalence and management strategies of latent TB in India
2023	“Test and Treat Model for Tuberculosis Preventive Treatment among Household Contacts of Pulmonary Tuberculosis Patients in Selected Districts of Maharashtra: A Mixed-Methods Study on Care Cascade Timeliness and Early Implementation Challenges (Project Axshya)”	Mahajan P, et al. Tropical Medicine and Infectious Disease. 2023 Dec 23;9(1):7.	To evaluate the test and treat model for TB preventive treatment among household contacts in Maharashtra	Mixed-methods study assessing care cascade timeliness and implementation challenges	Identified timeliness issues and early implementation challenges in the test and treat model for TB prevention
2023	Feasibility, enablers and challenges of using timeliness metrics for household contact tracing and TB preventive therapy in Pakistan	Jamil B, Nair D, Thekkur P, Laeeq N, Adil A, Khogali M, et al	To assess the feasibility, enablers and challenges of implementing 7-1-7 metric for screening and management of household contacts of index patients with bacteriologically confirmed pulmonary TB in Karachi city, Pakistan	explanatory mixed methods study	7-1-7 timeliness metrics was found out to be feasible and useful
2023	“Healthcare worker perceived barriers and facilitators to implementing a tuberculosis preventive therapy program in rural South Africa: a content	Brittney J. van de Water, Michael Wilson, Karl le Roux, Ben Gaunt, Sarah Gimbel, Norma C. Ware	to identify barriers and facilitators to TB contact investigations and TPT management in rural Eastern Cape, South Africa	semi-structured interviews	Identified barriers and facilitators with the help of consolidated framework of

	analysis using the consolidated framework for implementation research”				implementation research
2023	“Outcomes and Challenges in the Programmatic Implementation of Tuberculosis Preventive Therapy among Household Contacts of Pulmonary TB Patients: A Mixed-Methods Study from a Rural District of Karnataka, India”	Samudyatha UC et al. (TropicalMed)	To evaluate the outcomes and challenges of TPT implementation in a rural district of Karnataka	Mixed-methods study	Identified several challenges, including logistical issues and patient adherence
2022	“The Usability, Acceptability, and Functionality of Smart Oral Multidose Dispensing Systems for Medication Adherence: A Scoping Review”	Faisal S, Ivo J, Lee C, Carter C, Patel T. SAGE Journals	To review the usability, acceptability, and functionality of smart oral multidose dispensing systems.	Scoping review of studies involving medication adherence devices.	The systems were generally usable and acceptable, with improved adherence reported.
2022	National Tuberculosis Prevalence Survey in India, 2019 -21	Ministry of Health and Family Welfare, https://tbcindia.gov.in/showfile.php?lid=3659	To determine the point prevalence of microbiologically confirmed pulmonary TB among individuals aged 15 years and older in India, both at the national and state levels.	Population based cross-sectional study	The prevalence of TB infection among individuals aged 15 years and older was identified as 31.4%.
2022	Prevalence Trends of Latent Tuberculosis Infection at the Global, Regional, and Country Levels from 1990–2019	Ding C, Hu M, Guo W, et al. International Journal of Infectious Diseases. 2022 Sep 1;122:46–62	Analyze prevalence trends of latent TB infection globally and regionally	Trend analysis over three decades using	Identification of significant trends and regional variations in

				epidemiological data	latent TB infection	
2022	Development of a theory-informed questionnaire to assess the acceptability of healthcare interventions	Mandeep Sekhon, Martin Cartwright, Jill J Francis	To develop a generic TFA questionnaire that can be adapted to assess acceptability of any healthcare intervention	5-step pre-validation method for developing patient-reported outcome instruments	Questionnaire was developed	
2022	They do not have symptoms – why do they need to take medicines? Challenges in tuberculosis preventive treatment among children in Cambodia: a qualitative study	An Y et al. (BMC Pulmonary Medicine)	To explore challenges in TB prevention	Qualitative interview	Identified key challenges in preventive treatment	
2022	“Reasons for poor uptake of TB preventive therapy in South Africa”	Baloyi DP et al. (Public Health)	To identify reasons for poor uptake	Qualitative study	Found multiple reasons, including system barriers	
2021	Predictors of Acceptability and Engagement in a Self-Guided Online Intervention	Gulliver A, Calear AL, Sunderland. 2021 Sep 1;25:16	To identify predictors of acceptability and engagement in mental health interventions	Analysis of module	High acceptability and engagement	
2021	“Lifetime Burden of Disease Due to Incident Tuberculosis: A Global Reappraisal Including Post-Tuberculosis Sequelae”	Menzies NA, Quaife M, Allwood BW, et al. The Lancet Global Health. 2021 Dec 1;9(12)	Reappraise the global burden of TB, including post-TB sequelae	Global burden analysis, including long-term impacts of TB.	Comprehensive assessment of TB's lifetime burden, emphasizing the need for broader healthcare strategies.	

2021	Contributing Factors in the Tuberculosis Care Cascade in India: A Systematic Literature Review	Yasobant S, Bhavsar P, Kalpana P, Memon F, Trivedi P, Saxena D. Risk Management and Healthcare Policy. 2021 Aug 10;14:3275–86	To identify factors contributing to the tuberculosis care cascade in India	Systematic literature review of factors in the TB care cascade	Identified key factors affecting the TB care cascade in India, including patient and health system factors
2021	“WHO consolidated guidelines on tuberculosis. Module 1: Prevention. Tuberculosis preventive treatment”	World Health Organization. 2021 Jun 29;(2):86–92. Available from: WHO guidelines	To provide updated guidelines on tuberculosis preventive treatment	Compilation of guidelines based on global TB data and research	Emphasized the importance of preventive treatment for high-risk groups to achieve TB elimination by 2030
2021	“Isoniazid Preventive Therapy among Children Living with Tuberculosis Patients: Is It Working? A Mixed-Method Study from Bhopal, India”	Singh AR et al. (Journal of Tropical Pediatrics)	“To evaluate the effectiveness of isoniazid preventive therapy among children living with TB patients”	Mixed-methods study	Found gaps in implementation
2021	“Tuberculosis Preventive Treatment in India: A Much-Needed Push Towards Achieving TB Elimination”	Saurabh S, Bhardwaj P. J Family Med Prim Care. 2021 Dec;10(12):4605–6.	To discuss the importance and need for Tuberculosis Preventive Treatment (TPT) in India	Review of existing TB preventive measures and their effectiveness	Emphasis on the need for a robust TPT strategy to achieve TB elimination in India
2020	Feasibility and Acceptability of an Innovative Adherence Intervention for Young Adults	Harry O, Crosby LE, Mara C, Ting TV, Huggins JL, Modi AC. Pediatr	To evaluate the feasibility and acceptability of an adherence intervention for young adults with lupus.	Enrollment, retention, and completion rates were analyzed.	The intervention was feasible and well-accepted by participants

	with Childhood-Onset Systemic Lupus Erythematosus	Rheumatol. 2020 Apr 26;18(1):36.			
2020	WHO's operational guidelines for TPT	World Health Organization	Reduce TB incidence by administering TPT to HHCs exposed to PTB patients without mandatory LTBI testing, except for special groups	Operational guidelines for administering TPT	Guidelines to ensure broad and effective implementation of TPT
2019	National Burden Estimates of Healthy Life Lost in India 2017: An Analysis Using Direct Mortality Data and Indirect Disability Data	Menon GR, Singh L, Sharma P, et al. The Lancet Global Health. 2019 Dec 1;7(12)	Estimate the burden of healthy life lost due to various diseases in India, including TB.	Analysis using direct mortality data and indirect disability data.	Detailed estimates of the national burden of diseases, highlighting TB's significant impact.
2019	National Strategic Plan 2017-25	Ministry of Health and Family Welfare, India (https://tbcindia.gov.in/WriteReadData/National%20Strategic%20Plan%202017-25.pdf)	To outline India's strategy for TB	Strategic plan doc	Focus on early detection, treatment
2018	A Web-Based Acceptance-Facilitating Intervention for Identifying Patients' Acceptance, Uptake, and Adherence of Internet- and Mobile-Based Pain Interventions	Journal of Medical Internet Research	To evaluate the factors influencing patient acceptance, uptake, and adherence to internet-based pain interventions.	Randomized controlled trial with analysis of module completion and dropout rates.	Higher acceptance was associated with better adherence.
2018	Tuberculosis preventive treatment: the next chapter of tuberculosis elimination in India	Moonan PK et al. (BMJ Global Health)	To discuss the next steps in TB elimination	Review of existing evidence	Emphasized the need for preventive treatment

2018	Latent Tuberculosis Infection: Updated and Consolidated Guidelines for Programmatic Management	World Health Organization. Available from: NCBI	Update and consolidate guidelines for the management of latent tuberculosis infection	Comprehensive review and consolidation of existing guidelines	Updated recommendations for latent TB infection management
2017	Acceptability of healthcare interventions: an overview of reviews and development of a TFA	Mandeep Sekhon, Martin Cartwright, Jill J Francis	to develop a multi-construct theoretical framework of acceptability of healthcare interventions	Systematic Review, and inductive and deductive reasoning	Formation of TFA
2017	National Strategic Plan (NSP) of India for 2017-25	GoI	To eliminate TB in India by 2025 through the core strategies: DETECT, TREAT, PREVENT, BUILD	Outlines interventions under the “Detect, Treat, Prevent, Build” strategy to reduce TB burden	Emphasizes the importance of interventions under the given categories of detecting, treating, prevention and building a community
2014	Mobile Cognitive Therapy: Adherence and Acceptability of an Online Intervention in Remitted Recurrently Depressed Patients	Kok G, Bockting C, Burger H, Smit F, Riper H. Internet Interventions. 2014 Apr 1;1(2):65–73.	To assess adherence and acceptability of mobile cognitive therapy in remitted depressed patients.	Measured adherence through the proportion of completed therapy modules.	High completion rates indicate
2015	End TB Strategy	WHO	Discuss the overview of the strategies to be adopted in order to combat TB globally	-	-

2010	Tuberculosis Infection among Young Nursing Trainees in South India	Christopher DJ et al. (PLOS ONE)	To assess the prevalence of TB infection among young nursing trainees in South India	Cross-sectional study	Found a high prevalence of TB infection among nursing trainees, highlighting the need for preventive measures
2009	“Compliance and Acceptability of Maintaining a 6-Month Pedometer Diary in a Rural, African American Community-Based Walking Intervention”	Zoellner J, Powers A, et al. Human Kinetics Journals	To evaluate compliance and acceptability of a 6-month pedometer diary in a walking intervention.	Compliance tracked through pedometer diary entries; acceptability assessed via participant feedback.	The majority of participants maintained the diary, indicating high acceptability.

Methodology

Study Design

The study employed a descriptive cross-sectional approach to comprehensively explore the point prevalence of acceptability of TPT among HHCs of PTB patients who initiated TPT from January 2022 to May 2023.

Prior to data collection commencement, stakeholder mapping an analysis was conducted. Following stakeholder engagement, a structured survey with both closed-ended and open-ended questions was administered to a sample size of 390 to gather data on sociodemographic, socioeconomic profile, access to healthcare services, knowledge about TB and TPT, experiences of social stigma and benefits of counselling.

Study Setting

Delhi is administratively divided into revenue districts and NTEP districts by the MoHFW and the Government of India (GoI). This study was strategically conducted in six NTEP districts of Delhi, specifically at the Shahdara Chest Clinic, DDU Chest Clinic, Jhandewalan Chest Clinic, BJRM Hospital, Jahangir Puri, Patparganj Chest Clinic, and National Institute for TB and Research and Development, Mehrauli (NITRD).

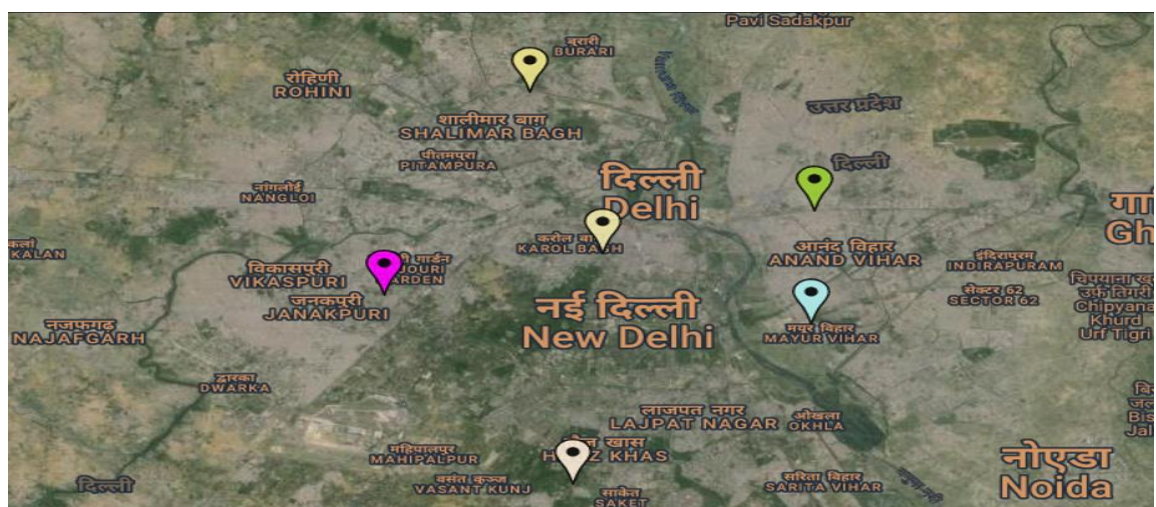


Figure 2: Map of the study area, Pink: DDU Chest Clinic, Yellow [top] : BJRM Hospital, Yellow [middle]: Jhandewalan Chest Clinic, White : NITRD, Mehrauli, Green: Shahdara Chest Clinic, Blue: Patparganj Chest Clinic

The selection of these clinics was intentional and based on their high burden of TB, ensuring that the study would capture a representative and diverse cross-section of the TB patient population. This approach was designed to enhance the generalizability of the findings and endow a inclusive understanding of the factors influencing the acceptability of TPT HHCs of pulmonary TB patients in areas with significant disease prevalence.

The research investigation was executed within the purview of chest clinics situated in the chosen 6 NTEP districts. As stipulated by the NTEP, these districts are delineated into 25 TB districts, each comprising one or more chest clinics and PHIs. The specific health facilities designated for the study include the Shahdara Chest Clinic, DDU chest clinic, Jhandewalan chest clinic, NDMC Clinic, Patparganj chest clinic, LRS Hospital (NITRD) which is an integral component of the broader TB healthcare infrastructure in the district, providing specialized diagnostic and therapeutic services for individuals afflicted with TB.

Study Population

The study population included all HHCs of bacteriologically confirmed PTB patients currently enrolled in the Ni-kshay portal and undergoing TB treatment within six NTEP districts as of May 31, 2024. The inclusion criteria specified HHCs aged 18 years and older who initiated TPT between January 1, 2023, and May 31, 2024.

Operational Definition of Household Contact

A household contact is defined as someone who has lived in the same dwelling as the index TB patient for at least three months before the patient's TB diagnosis (35). Alternatively, it can also refer to an individual who shared the same enclosed living space with the index patient for one or more nights or for frequent or extended periods during the day within the three months leading up to the start of the current TB treatment.

These dual criteria were established to ensure the inclusion of individuals who had constant and close inhabited exposure to the index TB patient, thus providing a comprehensive definition of HHCs for the purposes of this study. This definition is crucial for accurately identifying individuals at heightened risk of TB transmission because of their close and prolonged contact with the index patient.

Inclusion and Exclusion criteria

Inclusion criteria:

All HHCs meeting the following criteria will be included in the study:

- **Age Requirement:** Individuals aged 18 years and above who were initiated on a TPT regimen between January 1, 2023, and May 31st, 2024.
- **Risk-based Preference:** In families with more than two members, preference will be given to HHCs with a higher likelihood of developing tuberculosis. This includes HHCs who shared beds with the index patient or lived near the index patient before and during the intensive phase (IP) of the treatment regimen.

Exclusion Criteria

Individuals will be excluded from the study based on the following conditions:

- **Age Restriction:** Individuals younger than 18 years.
- **Non-Initiation on TPT:** HHCs who were not initiated on the TPT regimen.
- **Non-Consenting Individuals:** Individuals who do not provide informed consent for participation in this study.
- **Bedridden Status:** Individuals who are bedridden and unable to actively contribute in the study.
- **Non-Availability:** Working people who are unavailable for interviews during the scheduled visits.

Sampling technique

To ensure judicious and proportionate representation from each chest facility (chest clinics and Primary Health Institutions), a systematic random sampling technique was employed.

1. A comprehensive list of eligible candidates was compiled, adhering to the predefined inclusion and exclusion criteria. This list included all potential participants, even those who might not consent to participate, ensuring a comprehensive sampling frame.
2. Each HHC was assigned a unique identifier based on the Ni-kshay ID of the family member with PTB. The identifier format followed a systematic sequence (e.g., XXX001, XXX002), facilitating easy tracking and management of the candidates.
3. The selection interval was determined to ensure a manageable and representative sample size. For this study, an interval of 2 was chosen, meaning every second individual on the list was selected. This interval was chosen based on the total number of eligible candidates and the desired sample size.
4. Considering the possibility of non-consent or non-response, additional candidates were identified and kept in reserve. This contingency ensures that the target sample size is achieved despite potential dropouts. If a selected candidate did not consent, the next candidate in sequence was approached until the required sample size was met.

Sample size

The pooled prevalence of PTB in individuals aged 15 and older in Delhi over the 2019-2021 period was 534 cases per 100,000 people (20). For this study, which includes individuals aged 18 years and older, the sample size was calculated using the formula:

$$N_0 = z^2 * P (1-P) / (d-P)^2$$

where:

- Z is the Z-score corresponding to a 95% confidence interval, which is 1.96.
- P is the assumed population proportion, set at 50% to ensure maximum sample size.
- d is the margin of error, set at 5%.

Using these parameters, the initial sample size came to be 385. Considering a potential nonresponse and non-consent rate of 15%, the sample size was adjusted to ensure robustness adjusted sample size came to be 443

Rounding to the nearest whole number, the final sample size was determined to be 440 individuals. This adjustment ensures the study maintains adequate power and precision despite potential participant attrition.

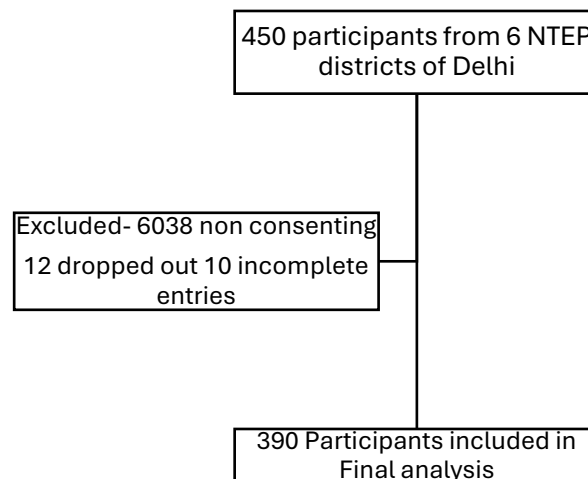


Figure 3: Final Sample Derivation

Data Collection

Prior to initiating data collection process, stakeholder mapping and analysis was conducted to understand the workings of the program. This was instrumental in designing data collection tools. The following tools were designed and pretested before the final employment:

1. Self-Constructed Structured Interview Schedule: A structured interview schedule was developed containing a mix of open- and closed-ended questions based on literature review. The tool was pretested for clarity and reliability,

ensuring that questions effectively captured the required data. The form was made using MS Word (Appendix 1).

2. Data Sheet: A structured data sheet was developed in MS Excel to systematically record responses from each participant every day to ensure accurate and organized data entry.
3. Code Sheet: A comprehensive code sheet was created to assign numeric and categorical codes to responses, facilitating efficient data analysis in statistical software (Appendix 2).

The interview tool was initially developed in English and subsequently reviewed by subject matter experts to ensure comprehensiveness and relevance. Upon finalization, the tool was translated into Hindi to accommodate the linguistic preferences of the target population, predominantly composed of Hindi-speaking patients and their families.

The dataset was meticulously organized in MS Excel, encompassing all variables derived from the interview schedule. Each variable was assigned a distinct name, adhering to conventions that facilitate subsequent analysis in IBM SPSS Version 22. This structured approach was taken up to ensure seamless integration of the data within statistical software.

For each question in the interview schedule, a corresponding coded response was established, predominantly utilizing numeric values. Open-ended questions, which required textual responses, were appropriately coded as string variables.

Before beginning the data collection, the tool underwent pretesting to evaluate its internal consistency and reliability. This involved administering the questionnaire to a pilot sample of 15 respondents. Cronbach's Alpha was calculated to assess the reliability, resulting in a value of 0.703. This value is above the commonly accepted threshold of 0.7, indicating satisfactory reliability of the instrument (47).

Table 3: Reliability Statistics for the Interview Schedule

Reliability Statistics	N (%)	No of Items	Value
Cronbach's Alpha	382 (97.9)	67	.703

Following the pretesting and necessary adjustments, the final version of the tool was reviewed again by experts to ensure its validity. The refined 65 item questionnaire was then utilized for conducting interviews, ensuring robust data collection aligned with the study objectives.

Table 4: Data Instrumentation Steps

Steps	Description
Initial Development and Review	Interview Tool Development: The interview tool was initially developed in English and reviewed by subject matter experts for comprehensiveness and relevance. It was then translated into Hindi to accommodate the target population's linguistic preferences. Data Sheet Preparation: The dataset was organized in Microsoft Excel with distinct variable names, adhering to conventions for analysis in IBM SPSS. Code Sheet Development: Coded responses were established for each question, primarily using numeric values. Open-ended questions were coded as string variables for clarity and consistency.
Pretesting for consistency and reliability	Pretested with 15 respondents. Cronbach's Alpha: 0.703, indicating satisfactory reliability.
Final Review and Deployment	Reviewed by experts post-pretesting. Finalized tool used for interviews.

After the tools had been finalized, following steps were taken for data collection:

1. Retrospective Data Retrieval

A comprehensive retrospective data retrieval process was initiated to extract information on HHCs aged 18 years and above, who were initiated on TPT between January 1, 2023, and May 31, 2024. This data was collected from the Nishay portal, focusing on HHCs of bacteriologically confirmed DS PTB patients registered and treated within the same timeframe.

2. Telephonic Pre-Screening

In the initial phase, patients were systematically categorized based on predefined inclusion and exclusion criteria. The inclusion criteria were meticulously applied to ensure the eligibility of individuals for participation. HHCs meeting these criteria were identified and subsequently subjected to a thorough review to compile a comprehensive list of individuals with complete information.

Furthermore, a telephonic call was employed to establish initial contact with the identified DS PTB patients. During these interactions, patients were queried about their familial demographic details, including family size and the occupational status of household members. This pre-screening step facilitated the collection of pertinent data and helped arrange in-person visits according to the convenience of the participants (at the chest clinic or at home).

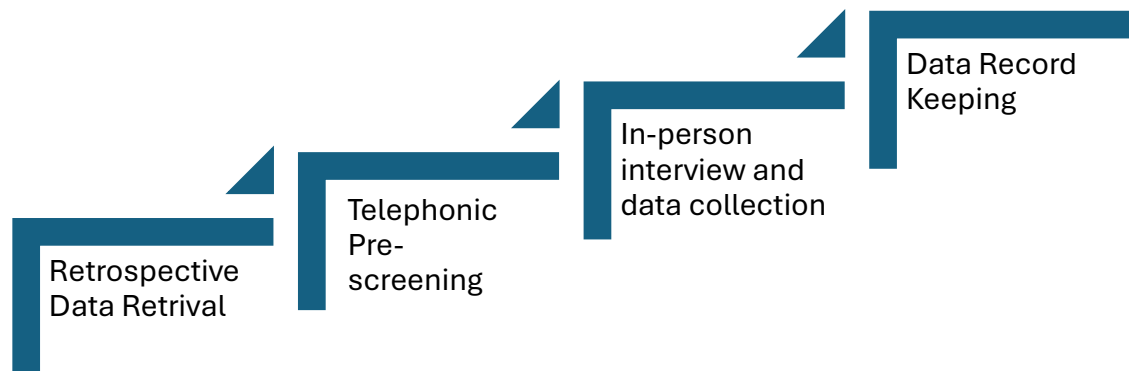


Figure 4: Data Collection Method

3. In-Person interview and Data Collection

After the telephonic pre-screening, arrangements were made for in-person visits to either the facility or the residence of the patient based on the convenience of the family. Each selected HHC was subjected to at least two, and a maximum of three, meticulously planned visits. The scheduling of these visits was mutually agreed upon, ensuring a suitable time for both the participants and the research team. This approach optimized data collection efforts and facilitated the inclusion

of a maximal number of HHCs. For each district, interviews were conducted mostly within the premises of the PHI/clinics in an empty room. Each interview took an average time of 20 minutes. With an average

4. Data Record Keeping

A detailed account of the total number of interviews conducted, including fully completed interviews, partially completed interviews, and instances of non-consent, was maintained throughout the study. Additionally, a record of patient grievances, whether related or unrelated to the interview (such as complaints about the after-effects of the medicine, government policy-related issues, etc.) and how they were facilitated by the PI was also maintained.

Data Management and Analysis

The data management process began with initial data entry and cleaning in Microsoft Excel 2013, followed by integration into the main database in IBM SPSS Statistics Version 22. Baseline characteristics were assessed through descriptive statistics, with categorical variables analysed using frequency and percentages. For continuous variables, the mean $\pm$ SD and 95% confidence intervals (CI) were calculated for normally distributed data. To examine associations with TPT acceptability, categorical variables were analysed using the Chi-Square Test. Variables found to be significantly associated with TPT acceptability were further assessed through regression analysis, adjusting for odds ratios (OR). Statistical significance was set at a p-value of less than 0.05. Data analysis was performed using IBM SPSS Statistics Version 22 for Windows itself. Additionally, the data was securely stored, with regular backups uploaded to Google Drive weekly, and access restricted to authorized personnel with secure passwords. Detailed documentation was maintained for transparency and reproducibility, with periodic reviews conducted to incorporate improvements and address emerging issues in the data management workflow.

Table 5: Data Management Strategy

Steps	Details
Data Entry	Initial Entry: Data entered into Excel on the same day of collection. Database Integration: Merged with main database in SPSS.
Data Cleaning and Organization	Consistency Checks: Reviewed for accuracy; inconsistencies corrected. Handling Missing Data: Imputed nil values or excluded non-completions
Data Storage and Security	Regular Backups: Cleaned data uploaded to Google Drive weekly. Access Control: Restricted access to authorized personnel with secure passwords
Data Analysis Preparation	Variable Coding: Coded variables in SPSS (numeric for categorical, string for open-ended). Documentation: Maintained for transparency and reproducibility.
Monitoring and Review	Periodic Reviews: Routine updates to incorporate improvements and address issues.

Ethical Considerations

The research proposal underwent rigorous scrutiny by the Institutional Review Board (IRB) approval and was approved from the IIHMR University IRB Board for the Protection of Human Subjects, IORG0007355, OMB No. 0990-0299, IRB 00008833 on June 18, 2024 (Appendix 3). Concurrently, the study protocol was also submitted to the Operations Research Committee of Delhi for TB and was approved by the Members of the OR Committee as well as State Program Officer (SPO) via mail on June 12, 2024 (Appendix 4).

Furthermore, a comprehensive written consent process was also instituted in local language, wherein all prospective research participants were provided with detailed information about the study's objectives, procedures, and potential implications. The informed consent document explicitly explained the voluntary nature of participation, the assurance of confidentiality, and the right to withdraw from the study at any juncture

without repercussion. Each participant was offered an opportunity to pose questions and seek clarifications before expressing their voluntary consent to partake in the research.

Moreover, identity of each participant was hidden, and unique serial number was allocated to the participant to protect their identity. A unique identification system was instituted to each participant, representing a distinct Health Care Center (HCC) of PTB and assigned a unique identifier based on the NIKSHAY ID of the Index Patient (for instance- if the ID of the index patient is 12345678 then the unique number allocated was 5678”001” where first fourth digits were of the ID of the index patient, while the last three were created for the participant and so forth.

Results

The results have been systematically presented in alignment with the methodological framework of the study. The analysis began with Stakeholder Mapping and Analysis, providing a foundational understanding of the key actors involved in the implementation of TPT. Following this, Statistical Analysis was conducted in three stages:

1. **Univariate Analysis:** This phase involved the derivation of baseline demographic and clinical characteristics of the study participants, providing an overview of the population under study.
2. **Bivariate Analysis:** A Chi-Square Test was employed to explore associations between key variables, including sociodemographic factors, socioeconomic status, disease stigma, accessibility to TPT, and participants' knowledge about TB and TPT, with the acceptability of TPT. This analysis was crucial for identifying potential relationships between these variables and TPT acceptability.

Following the Statistical Analysis, an overview of the patients' perspectives was also explored using data collected from open-ended questions. Repetitive responses were identified, quoted, and discussed, with these insights presented in a subsequent table for a more in-depth understanding of the participants' views and experiences. This qualitative analysis complemented the statistical findings, providing a richer, more nuanced perspective on the acceptability of TPT.

Primary Outcome

The primary outcomes examined include whether individuals remained on TPT, initiated but dropped TPT, or completed TPT.

A. Stakeholder mapping and analysis

Identification of Stakeholders (internal and external)

Key stakeholders, including members from the MoHFW, Central TB Division, NGOs, and community members, were identified based on their relevance and influence on TPT initiatives. Regular communication was established through meetings, workshops, and feedback sessions to ensure stakeholders are informed and involved in the study process. Stakeholder feedback was also regularly assessed to ensure alignment with project goals.

Table 6: Stakeholder Identification and Analysis

Stakeholder Name	Contact Details	Interest/ expectations	Influence and Power	Impact	Attitudes & relationships
MoHFW and NTEP program members	Room No. 348 Nirman Bhawan	Improvement in the health outcomes achieved due to preventive measures High interest	High influence and power over the project	High impact on the project given the UNHLM set SDG targets to achieve elimination by 2030 and GoI's approach to achieve it by 2025	Neutral attitude towards the project
Central TB Division (Consultants working on TPT)	2 nd Floor Jeevan Vihar Building, Sansad marg	Improvement in the health outcomes achieved due to preventive measures High interest	High influence and power in terms of policy formation and decision making	High impact on the project	Positive approach towards the project
NGOs and International Organizations working on TPT (such as The Union, Jeet, WHO, etc)	-	Improvement in the health outcomes achieved due to preventive measures High interest	Low influence and power	Low impact on the project	Positive approach towards the project
State TB Demonstration Center (all the members of Operations Research Committee of Delhi)	LNJP Hospital, Delhi Gate	State focused goals to reduce burden of disease Low Interest	High influence and power	High impact on the project	Positive approach towards the project

State TB Cell (State TB officer and national consultants)	DGHS Dispensary, Gulabi Bagh	State focused goals to reduce burden of the disease High interest	High influence and power	High impact on the project	Positive approach towards the project
District TB Cell (District TB officers at Parparganj Chest Clinic, Shahdara chest clinic, DDU Hospital, Jhandevalan Chest clinic, BJRM Hospital, NITRD)	Multiple locations	District focused goals to improve notification and to start HHCs on TPT Low Interest	High influence and power	Low impact on the project	Positive approach
Community workers and volunteers (STS, TBHV and TB Champions)	Placed at every chest clinic and TU/PHIs	Low interest	Low influence and power	Low impact on the project	Sceptical approach towards TPT due to burnout and extreme weather conditions
Community members (PTB patients and HHCs)	-	Low interest	Low influence and power	High impact on the project	-

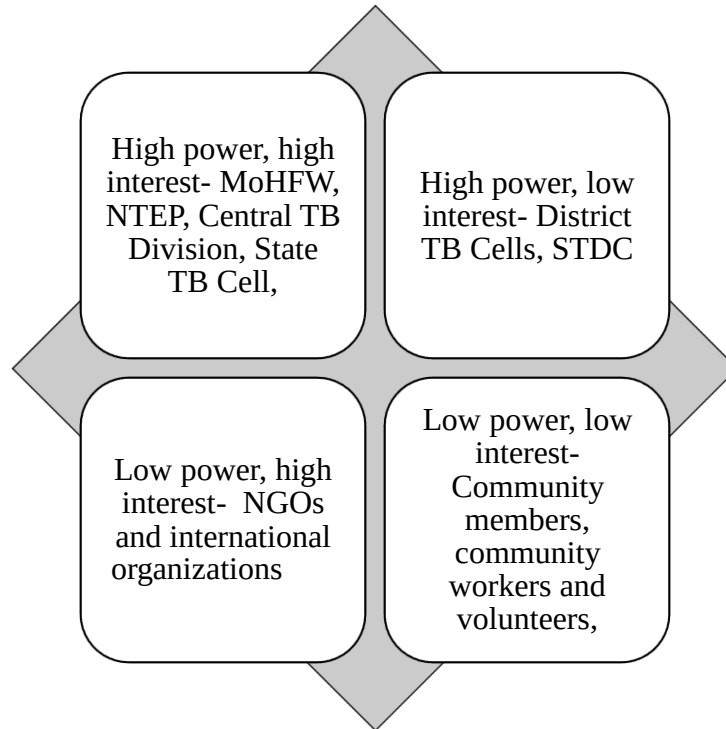


Figure 5: Stakeholder Mapping

B. Demographic and Clinical Characteristics of Study Participants

Demographic Characteristics

A total of 450 individuals were enrolled from six NTEP districts who met the inclusion criteria (Figure 4). The net response rate was 87% (390) with most of the non-response attributable to either inability to get in touch or denying consent, leaving the interview in the middle, wrong entries.

Table 7: Demographic characteristics of the HHC of the DS TB patients (n = 390)

Characteristics	N (%)	Confidence Interval (95%)
Age of the participant		
1. 18-24 years	88 (22.6)	18.6-26.75
2. 25-34 years	78 (20.0)	16.3-23.97
3. 35-44 years	115 (29.5)	24.97-34.03
4. 45-54 years	75 (19.2)	15.29-23.11
5. 55-64 years	23 (5.9)	3.56-8.24
6. 65-74 years	11 (2.8)	1.16-4.44
Gender		
1. Male	188 (48.2)	43.24-53.16
2. Female	202 (51.8)	46.84-56.76
Marital Status		
1. Single	123 (31.5)	26.89-36.11
2. Married	247 (63.3)	58.52-68.08
3. Widowed	15 (3.8)	1.90-5.70
4. Separated	5 (1.3)	0.01-1.99
Education Level		
1. Illiterate	138 (35.4)	30.65-40.15
2. Primary School	60 (15.4)	11.82-18.98
3. Middle School	77 (19.7)	15.75-23.65
4. High School	56 (14.4)	10.92-17.88
5. Intermediate/diploma	11 (2.8)	1.16-4.44
6. Graduate	37 (9.5)	0.06-0.12
7. Professional Degree	11 (2.8)	1.16-4.44
Relation with the PTB Patient		
1. Parents	96 (24.9)	20.61-29.19
2. Grandparents	1 (0.3)	-0.24-0.84
3. Siblings	49 (12.7)	9.40-16.00
4. Spouse	92 (23.9)	19.67-28.13
5. Children	122 (31.7)	27.08-36.32
6. Others	25 (6.5)	4.05-8.95

The study population had a mean age of the participants was 37 years (range: 18-72 years, SD±12.6 years), comprising of participants predominantly belonging to the age group of 18-44 years, with 22.6% aged 18-24 years (95% CI: 18.6%-26.75%), 20.0% aged 25-34 years (95% CI: 16.3%-23.97%), and 29.5% aged 35-44 years (95% CI: 24.97%-34.03%).

Gender distribution was nearly equal, with 48.2% male (95% CI: 43.24%-53.16%) and 51.8% female (95% CI: 46.84%-56.76%). Most participants were married (63.3%, 95% CI: 58.52%-68.08%), and a significant portion had some level of education, including 35.4% who were illiterate (95% CI: 30.65%-40.15%) and 19.7% who completed middle school (95% CI: 15.75%-23.65%).

Clinical Characteristics

Table 8: Clinical Characteristics of the HHC of the DS TB patients (n = 390)

Clinical characteristics	N (%)	CI (95%)
1. BMI		
• Underweight	58 (14.9)	11.37-18.43
2. Co-morbidities		
• Diabetes	23 (6.0)	3.64-8.36
• Rheumatoid Arthritis	5 (1.3)	0.18-2.42
• Tobacco consumers	16 (4.2)	2.21-6.19
• Other immune deficient diseases	10 (2.6)	1.02-4.18
3. No. of Household Contacts		
• 0-5	299 (76.6)	72.40-80.80
• 5-9	79 (20.2)	16.22-24.18
• 10 and above	12 (3.1)	1.38-4.82
4. No. of Bedrooms in a house		
• 0-3	372 (95.4)	93.32-97.48
• 4-7	17 (4.4)	2.36-6.44
5. Separate Bedroom of the PTB	210 (53.8)	48.85-58.75
6. Total Number of weeks PTB patient took the treatment for		
• <8 weeks	100 (25.6)	21.27-29.93
• >8 weeks	290 (74.4)	70.07-78.73

High-risk factors included 14.9% underweight participants (95% CI: 11.37%-18.43%) and 6.0% participants with diabetes (95% CI: 3.64%-8.36%) and 4.2% who were tobacco users (95% CI: 2.21% - 6.19%). Only 53.8% participants had PTB patients in their houses with separate bedrooms (CI: 48.85%-58.75%). The majority had 0-5 HHCs (76.6%, 95% CI: 72.40%-80.80%), with most households having 0-3 bedrooms (95.4%, 95% CI: 93.32%-97.48%). Notably, 25.6% of PTB patients (95% CI: 21.27%-29.93%) took treatment for less than eight weeks, whereas 74.4% of PTB patients (95% CI: 70.07%-78.73%) admitted of completing treatment for more than eight weeks.

Regarding their relationship with PTB patients, 31.7% were children of the patients (95% CI: 27.08% - 36.32%), 24.9% were parents (95% CI: 20.61% - 29.19%), and 23.9% were spouses (95% CI: 19.67% - 28.13%) (Table 5 [b]).

C. Association between socio demographic, socioeconomic, disease stigma, accessibility to treatment, knowledge about TB and TPT and acceptability of TPT

A chi square test was conducted to determine the association between socio demographic, socioeconomic, disease stigma, accessibility to treatment, knowledge about TB and TPT and acceptability of TPT. It is worth mentioning that TPT Acceptability was gauged using following Behavioural Measures:

1. Adoption and Adherence Rates: The percentage of people who choose TPT to indicate higher or lower acceptability both- Currently on TPT (Initiated and on Treatment)
2. Completion Rate: High rates of complete use or adherence to a treatment regimen to indicate higher acceptability- Completed the regimen (Completed TPT)
3. Dropout Rate: Higher dropouts to a treatment regimen to indicate low acceptability- Started but dropped (Initiated and Dropped) (n=390)

The association between various background characteristics and the acceptability of TPT, measured by initiation, dropout, and completion rates was calculated using Chi Square.

Sociodemographic Factors and Acceptability of TPT

Age and Acceptability of TPT

Table 9: Association between age and Acceptability of TPT (n=390)

Background characteristics	TPT Initiated and on Continued, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Age	0.884	0.198	0.677
18-44	171 (43.8)	69 (17.7)	135 (34.6)
45-74	68 (17.4)	21 (5.4)	57 (14.6)

The chi square analysis shows no statistically significant differences in TPT acceptability between the two age groups (18-44 and 45-74). In the 18-44 age group, 43.8% continued TPT, 17.7% dropped, and 34.6% completed it, with a p-value of 0.884. Similarly, in the

45-74 age group, 17.4% continued, 5.4% dropped, and 14.6% completed, with a p-value of 0.198.

Gender and Acceptability of TPT

The chi square analysis of TPT acceptability outcomes by gender reveals no statistically significant differences (adoption and adherence, $p = 0.71$; dropout $p = 0.739$; and completion $p = 0.928$) between males and females. Among males, 30% continued TPT, 10.8% dropped, and 23.8% completed it, while among females, 31.3% continued, 12.3% dropped, and 25.4% completed TPT.

Table 10: Association between gender and Acceptability of TPT (n=390)

Background characteristics	TPT Initiated and on Continued, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Gender	0.71	0.739	0.928
Male	117 (30)	42 (10.8)	93 (23.8)
Female	122 (31.3)	48 (12.3)	99 (25.4)

Religion and Acceptability of TPT

The chi-square analysis of TPT acceptability outcomes by religion indicates significant differences in some outcomes. Among Hindus, 20.6% continued TPT, 4.9% dropped, and 11.3% completed it, whereas among other religions, 40.6% continued, 18.3% dropped, and 37.8% completed TPT. The p-values show no significant difference in continuation rates (0.518), but there are significant differences in dropout ($p = 0.009$) and completion ($p = 0.000$) rates.

Table 11: Association between religion and Acceptability of TPT (n=390)

Background characteristic	TPT Initiated and on Continued, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Religion	0.518	0.009**	0.000***
Hindu	80 (20.6)	18 (4.9)	44 (11.3)
Others	158 (40.6)	71 (18.3)	147 (37.8)
***p value < 0.01; **p value < 0.05;			

Place of birth and Acceptability of TPT

The analysis of TPT acceptability outcomes by place of birth shows some differences between those born in Delhi and those born elsewhere. Among individuals born in Delhi, 38.2% continued TPT, 14.4% dropped, and 27.9% completed it, while among those born outside Delhi, 23.1% continued, 8.7% dropped, and 21.3% completed TPT. The p-value of 0.067 for continuation suggests a marginally significant difference, indicating that place of birth may slightly influence the likelihood of continuing TPT. However, the p-values for dropout (0.441) and completion (0.442) are not significant.

Table 12: Association between place of birth and Acceptability of TPT (n=390)

Background characteristics	TPT Initiated and on Continued, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Place of birth			
Delhi	149 (38.2)	56 (14.4)	109 (27.9)
Others	90 (23.1)	34 (8.7)	83 (21.3)
	0.067*	0.441	0.442
*p value < 0.10			

Marital Status and Acceptability of TPT

The analysis of TPT acceptability outcomes by marital status shows no significant differences between married individuals and others. Among married participants, 39% continued TPT, 13.8% dropped, and 30.3% completed it, while among others, 22.3% continued, 9.2% dropped, and 19% completed TPT. The p-values for continuation (0.891), dropout (0.454), and completion (0.449) indicate no statistically significant differences based on marital status.

Table 13: Association between marital status and Acceptability of TPT (n=390)

Background characteristics	TPT Initiated and on Continued, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Marital Status			
Married	152 (39)	54 (13.8)	118 (30.3)
Others	87 (22.3)	36 (9.2)	74 (19)
	0.891	0.454	0.449

Duration of Stay at the Current Address and Acceptability of TPT

Based on the duration of stay at the current address, significant differences in some outcomes were observed. Among those who have stayed at their current address for more than 5 years, 1.8% continued TPT, 2.6% dropped, and 2.8% completed it. For those with less than 5 years of residence, 36.9% continued, 74.4% dropped, and 46.4% completed TPT. The p-value of 0.028 for dropout indicates a statistically significant difference, suggesting that a longer duration of stay at the current address is associated with a higher dropout rate. However, the continuation ($p = 0.988$) and completion ($p = 0.302$) rates do not show significant differences based on the duration of residence.

Table 14: Association between duration of stay and Acceptability of TPT (n=390)

Background characteristics	TPT Initiated and on Continued, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Duration of Stay at Current Address	0.988	0.028*	0.302
Less than 5 years	7 (1.8)	290 (74.4)	11 (2.8)
More than 5 years	144 (36.9)	10 (2.6)	181 (46.4)
*p value < 0.10			

Type of residence and Acceptability of TPT

The analysis of TPT acceptability based on the type of residence shows significant differences between rural and urban populations. In rural areas, 11% continued TPT, 10.5% dropped, and 8.5% completed it, whereas in urban areas, 50.3% continued, 12.6%

dropped, and 40.8% completed TPT. The p-values (0.000 for both continuation and dropout, and 0.018 for completion).

Table 15: Association between type of residence and Acceptability of TPT (n=390)

Background characteristics	TPT Initiated and on Continued, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Type of residence	0.000***	0.000***	0.018**
Rural	43 (11)	41 (10.5)	33 (8.5)
Urban	196 (50.3)	49 (12.6)	159 (40.8)
***p value < 0.01; **p value < 0.05;			

Type of Family and Acceptability of TPT

Similarly, the chi square analysis between acceptability outcomes of TPT by type of family reveals significant differences. For living arrangements, those in nuclear families had a higher continuation rate (53.1%) compared to those in joint families (8.2%), with a significant p-value of 0.013. However, dropout and completion rates showed no significant differences (p-values of 0.433 and 0.594, respectively).

Table 16: Association between type of family and Acceptability of TPT (n=390)

Background characteristics	TPT Initiated and on Continued, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Type of Living arrangement	0.013**	0.433	0.594
Nuclear Family	207 (53.1)	77 (19.7)	161 (41.3)
Joint Family	32 (8.2%)	13 (3.3)	31 (7.9)
Family Size	0.011**	0.895	0.62
0-8 Members	234 (60.2)	86 (22.1)	186 (47.8)
9-17 Members	4 (1)	3 (0.8)	6 (1.5)
**p value < 0.05			

Regarding family size, smaller families (0-8 members) had significantly higher continuation rates (60.2%) compared to larger families (9-17 members) with only 1% continuation, as indicated by a p-value of 0.011. However, family size did not significantly impact dropout ($p = 0.895$) or completion ($p = 0.62$) rates.

Socioeconomic Status and Acceptability of TPT

Education Level of Respondents and Acceptability of TPT

Table 5(k) presents the association between education level of the participant and acceptability of TPT. The analysis reveals no statistically significant differences across educational categories (p-values of 0.233, 0.197, and 0.375, respectively). Among illiterate participants, 20.3% continued TPT, 9.2% dropped, and 18.2% completed it. For those with primary education, 9.7% continued, 2.6% dropped, and 5.9% completed TPT. Participants with secondary education had 11% continuation, 3.1% dropout, and 9.5% completion rates. Those with a high school education showed 9.2% continuation, 4.1% dropout, and 7.2% completion. Finally, participants with graduation and above education had 11% continuation, 4.1% dropout, and 8.5% completion rates.

Table 17: Association between education level of respondents and acceptability of TPT (n = 390)

Background Characteristics	Initiated and continued TPT, n (%)	Initiated on TPT and dropped, n (%)	TPT completed, n (%)
Education of the Participant	0.233	0.197	0.375
Illiterate	79 (20.3)	36 (9.2)	71 (18.2)
Primary	38 (9.7)	10 (2.6)	23 (5.9)
Secondary	43 (11)	12 (3.1)	37 (9.5)
High School	36 (9.2)	16 (4.1)	28 (7.2)
Graduation and above	43 (11)	16 (4.1)	33 (8.5)

Occupation of the Respondent and Acceptability of TPT

On the other hand, the analysis between occupation of the respondent and acceptability outcomes of TPT revealed significant associations. For participants in low-skilled occupations, 52.3% initiated and continued TPT, but 20% initiated and then dropped out,

and 41.3% completed the therapy. In contrast, only 9% of those in high-skilled occupations initiated and continued TPT, 3.1% dropped out, and 7.9% completed it. The statistical analysis shows a significant difference in TPT completion rates between low-skilled and high-skilled occupations ($p = 0.023$). Moreover, the differences in initiating and continuing TPT ($p = 0.077$) and dropping out ($p = 0.736$) are not statistically significant.

Table 18: Association between occupation of the respondents and Acceptability of TPT (n=390)

Background Characteristics	Initiated and continued TPT, n (%)	Initiated on TPT and dropped, n (%)	TPT completed, n (%)
Occupation of the participant	0.077	0.736	0.023**
Low skilled Occupation	204 (52.3)	78 (20)	161 (41.3)
High Skilled Occupation	35 (9)	12 (3.1)	31 (7.9)
** p value < 0.05;			

Household Income and Acceptability of TPT

Similarly, income of the household showed a statistically significant relationship with, TPT initiation and continuation ($p = 0.002$), TPT dropout ($p = 0.000$) as well as completion ($p = 0.012$). Participants with incomes below the poverty level had 23.6% initiating and continuing TPT, with 19% dropping out and 25.1% completing it. In contrast, those with incomes above the poverty level had higher rates of initiation and continuation at 37.7%, lower dropout rates at 4.1%, and a similar completion rate of 24.1%.

Table 19: Association between household income and acceptability of TPT (n = 390)

Background Characteristics	Initiated and continued TPT, n (%)	Initiated on TPT and dropped, n (%)	TPT completed, n (%)
Household income	0.002**	0.000***	0.012**
Below Poverty Levels	92 (23.6)	74 (19)	98 (25.1)
Above Poverty Levels	147 (37.7)	16 (4.1)	94 (24.1)
*** p value < 0.01; ** p value < 0.05;			

Stigma of the Disease and Acceptability of TPT

Table 5 (n) presents the association between background characteristics of disease related stigma and the acceptability of TPT.

There was a statistically significant relationship between TPT initiation and dropout and awareness of neighbours of the TB patient in the house ($p = 0.000$). Participants with neighbours aware of their TB status had higher rates of initiating and continuing TPT (36.2%) compared to those not aware (25.1%). However, the rate of dropping out was significantly higher among the aware group (17.7% vs. 5.4%), leading to a significant p-value of 0.001 for dropping out.

Table 20: Association between Neighbour Awareness of TB Patient and Acceptability of TPT (n=390)

Background Characteristics	Initiated and on TPT, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Neighbour Awareness of TB Patient	0.118	0.001**	0.221
Not Aware	98 (25.1)	21 (5.4)	67 (17.2)
Aware	141 (36.2)	69 (17.7)	125 (32.1)
**p value < 0.05			

Stigma from Neighbours and Acceptability of TPT

Table 21: Association between Stigma from Neighbours and Acceptability of TPT (n=390)

Background Characteristics	Initiated and on TPT, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Stigma from Neighbours	0.3	0.000***	0.13
No	25 (6.4)	22 (5.7)	22 (5.7)
Yes	214 (55)	68 (17.5)	169 (43.4)
***p value < 0.01			

Similarly, a strong association was found between Stigma from neighbours and dropouts. The presence of stigma from neighbours was associated with significantly higher rates of initiating and continuing TPT (6.4% vs. 55%) and completion (5.7% vs. 43.4%). The p-value for initiating and continuing TPT is 0.3, for dropping out is 0.00, and for completion is 0.13.

Hesitation to Tell Neighbours and Acceptability of TPT

The p-value of 0.015 shows a significant association between hesitation to tell neighbours and TPT initiation and continuation. Participants who hesitated to inform neighbours had significantly lower initiation and continuation rates (51.3% vs. 10%) and completion rates (38.5% vs. 10.8%). The p-values for initiation were 0.015 and continuation and for completion was 0.006, both statistically significant.

Table 22: Association between hesitancy to tell neighbours and acceptability of TPT (n = 390)

Background Characteristics	Initiated and on TPT, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Hesitation to Tell Neighbours	0.015**	0.434	0.006**
No	39 (10)	22 (5.6)	42 (10.8)
Yes	200 (51.3)	68 (17.4)	150 (38.5)
Reason for Hesitation	0.006**	0.083	0.129
Fear of Discrimination	39 (10)	22 (5.6)	42 (10.8)
Feel it is unnecessary to discuss	182 (46.7)	67 (17.2)	144 (36.9)
Others	18 (4.6)	1 (0.3)	6 (1.5)
**p value < 0.05			

Similarly, the reasons for hesitation, such as fear of discrimination, feeling it is unnecessary to discuss, or other reasons, show varied impacts. The reasons of hesitation were also statistically significantly associated with TPT initiation and continuation. Fear of discrimination and feeling it is unnecessary both have significant p-values for initiation and continuation (0.006 and 0.083) and for completion (0.129), reflecting the influence of these concerns on TPT participation.

Knowledge about TB and TPT and acceptability of TPT

A chi-square test was conducted to examine the association between participants' knowledge regarding and the acceptability of TPT, as presented in Table 5(0).

Participants' responses were recorded as open-ended and categorized into "correct," "partially correct," or "incorrect." Due to the limited number of responses in the "partially correct" category, this category was combined with the "correct" category for the analysis. The assessment of knowledge concerning TB symptoms was based on the four-symptom screening criteria proposed by the WHO. The responses were classified as follows:

1. Correct: All four symptoms (persistent cough with phlegm for more than 15 days, haemoptysis, weight loss, and night sweats) were identified.
2. Partially Correct: Two to three of the four symptoms were correctly identified.
3. Incorrect: Fewer than two of the symptoms were correctly identified.

Table 23: Association between knowledge about TB and TPT and acceptability of TPT (n=390)

Variables	Initiated and on TPT, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Symptoms of TB	0.030**	0.029**	0.003**
Incorrect	162 (41.5)	66 (16.9)	108 (27.7)
Correct	77 (19.7)	24 (6.2)	84 (21.5)
Transmission of TB	0.023**	0.042**	0.000***
Incorrect	42 (10.8)	7 (1.8)	12 (3.1)
Correct	197 (50.5)	83 (21.3)	180 (46.2)
Cost of TB and TPT Services	0.025**	0.44	0.524
Incorrect	7 (1.8)	3 (0.8)	8 (2.1)
Correct	232 (59.5)	87 (22.3)	184 (47.2)
Duration of TPT Regimen	0.014**	0.348	0.000***
Incorrect	152 (39)	49 (12.6)	76 (19.5)
Correct	87 (22.3)	41 (10.5)	116 (29.7)
Advantages of TPT	0.005**	0.054	0.206
Incorrect	41 (10.5)	13 (3.3)	47 (12.1)
Correct	198 (50.8)	77 (19.7)	145 (37.2)
***p value < 0.01; **p value < 0.05			

The analysis of TPT acceptability outcomes in relation to knowledge about TB reveals significant associations. Participants with correct knowledge of TB symptoms, transmission, and the duration of TPT regimen showed higher rates of initiating and continuing TPT. Specifically, those with correct knowledge of TB symptoms had a higher initiation rate (19.7% vs. 41.5%) and lower dropout (6.2% vs. 16.9%) and completion

rates (21.5% vs. 27.7%), with p-values indicating statistical significance (0.030 for initiation and continuation, 0.003 for completion).

Correct knowledge of TB transmission was associated with higher initiation (50.5%) and completion rates (46.2%) and lower dropout rates (21.3%), with significant p-values (0.023 for initiation, 0.042 for dropout, 0.000 for completion).

Knowledge of the cost of TB and TPT services did not significantly impact TPT outcomes ($p > 0.05$), while correct understanding of the duration of the TPT regimen was significantly associated with higher initiation (22.3% vs. 39%) and completion rates (29.7% vs. 19.5%), though dropout rates were not significantly affected ($p = 0.014$ for initiation and continuation, 0.000 for completion).

Understanding the advantages of TPT also showed significant influence on initiation (50.8% vs. 10.5%, $p = 0.005^{**}$) but had less impact on completion rates.

Accessibility to treatment and Acceptability of TPT

Table 5 (P) series investigate various association between accessibility to TPT and acceptability of TPT. The factors are categorized under Geographical Accessibility, Financial Accessibility, Organizational Accessibility, and Informational Accessibility.

Geographical Accessibility and Acceptability of TPT

The analysis revealed no statistically significant association between the distance from the DOTS center and the acceptability status of TPT whereas the mode of transport showed a significant impact on TPT completion ($p = 0.004$). Those who preferred walking to DOTS centre (22.8%) had a higher completion rate while others who chose either private (5.9%) or public (20.5%) mode of transport had comparatively low completion rate.

Table 24: Association between Geographic Accessibility and Acceptability of TPT (n = 390)

Background Characteristics	Initiated and on TPT, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Distance from the DOTS Centre	0.065	0.062	0.918
Less than 1km	110 (28.2)	37 (9.5)	95 (24.4)
More than 1km	129 (33.1)	53 (13.6)	97 (24.9)
Mode of Transport	0.502	0.104	0.004**
Walking	112 (28.7)	34 (8.7)	89 (22.8)
Private	46 (11.8)	16 (4.1)	23 (5.9)
Public	81 (20.8)	40 (10.3)	80 (20.5)
Time taken to reach DOTS Centre	0.551	0.020**	0.344
Less than 10 minutes	105 (26.9)	31 (7.9)	82 (21)
More than 10 minutes	134 (34.4)	59 (15.1)	110 (28.2)
**p value < 0.05;			

Furthermore, time taken to reach the DOTS center was found to be significantly associated with whether individuals initiated but later dropped TPT ($p = 0.020$). In comparison with those who took less than 10 minutes (7.9%), those who took more than 10 minutes (15.1%) had a higher dropout of TPT.

Financial Accessibility and Acceptability of TPT

Cost of services was also found to be statistically significantly associated with TPT initiation and continuation ($p = 0.025$). Participants who received services free of cost had higher initiation and continuation rates (59.5%) and completion rates (47.2%) compared to those for whom services were not free (1.8% for initiation and 2.1% for completion).

Table 25: Association between Financial Accessibility and Acceptability of TPT (n = 390)

Background Characteristics	Initiated and on TPT, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Cost of Services	0.025**	0.44	0.524
Not Free of Cost	7 (1.8)	3 (0.8)	8 (2.1)
Free of Cost	232 (59.5)	87 (22.3)	184 (47.2)
***p value < 0.01; **p value < 0.05; *p value < 0.10			

The p-value for initiation (0.025) suggests a significant effect, while the p-values for dropout (0.44) and completion (0.524) show no significant impact on dropout and completion rates.

Organizational Accessibility and Acceptability of TPT

A highly significant association was observed between the number of times individuals met with a physician during treatment and their likelihood of dropping TPT ($p = 0.000$). Those who met with the physician only 1-2 times had a higher dropout rate (9.7%) in comparison with those who met for either 3-4 times (7.9%) or more than 5 times (5.4%). No significant association could be determined between a satisfactory response to grievances and TPT acceptability.

Table 26: Association between Organizational Accessibility and Acceptability of TPT, (n = 390)

Background Characteristics	Initiated and on TPT, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
No. of times met the Physician	0.088	0.000***	0.605
1-2 times	146 (37.4)	38 (9.7)	120 (30.8)
3-4 times	67 (17.2)	31 (7.9)	53 (13.6)
More than 5 times	26 (6.7)	21 (5.4)	19 (4.9)
Satisfactory Response to Grievances\$	0.421	0.935	0.806
No	17 (23.3)	12 (16.4)	12 (16.4)
Yes	30 (41.1)	25 (34.2)	26 (35.6)
***p value < 0.01;			

Informational Accessibility and Acceptability of TPT

Health literacy, as imparted by healthcare workers, showed significant associations with TPT outcomes across multiple dimensions. Understanding TBI was significantly associated with adherence to TPT ($p = 0.012$) and completing TPT ($p = 0.000$). Participants who were given complete health literacy on TPT had a higher adherence rate (34.4%) in comparison to the participants who were given partial (17.4%) to no literacy (5.1%). Similarly, these participants had higher completion rate as well (35.4%), in comparison with those who were given little (9%) to no literacy (4.9%).

Furthermore, knowledge about the potential risks of TB was also strongly associated with adhering to TPT ($p = 0.000$), dropping out TPT ($p = 0.000$), as well as completing the TPT regimen ($p = 0.000$). Those who were provided with full knowledge (28.5%) had higher adherence in comparison with those who were given partial (8.7%) or no knowledge (24.1%). On the other hand, those who were provided with full knowledge had a higher dropout rate (16.7%) as well, in comparison with those who were given partial (3.1%) to no knowledge (3.3%). However, strong association was found between knowledge on potential risk and TPT completion where proper literacy (35.6%) had higher rates of completion of TPT in comparison to those who had partial (3.1%) to no literacy on risks (10.5%).

Table 27: Association between Informational Accessibility and Acceptability of TPT (n = 390)

Background Characteristics	Initiated and on TPT, n (%)	TPT Initiated and Dropped, n (%)	TPT Completed, n (%)
Health Literacy by Healthcare Workers			
On TBI	0.012**	0.228	0.000***
No	37 (5.1)	9 (2.3)	19 (4.9)
Yes	134 (34.4)	55 (14.1)	138 (35.4)
Partially	68 (17.4)	26 (6.7)	35 (9)
On Potential Risk of TB	0.000***	0.000***	0.000***
No	94 (24.1)	13 (3.3)	41 (10.5)
Yes	111 (28.5)	65 (16.7)	139 (35.6)
Partially	34 (8.7)	12 (3.1)	12 (3.1)
On Preventive Measures	0.204	0.575	0.000***
No	37 (9.5)	12 (3.1)	25 (6.4)
Yes	150 (38.5)	63 (16.2)	145 (37.2)
Partially	52 (13.3)	15 (3.8)	22 (5.6)
On Importance of TPT	0.001**	0.069	0.000***
No	58 (14.9)	17 (4.4)	30 (23.1)
Yes	101 (26)	54 (13.9)	126 (32.4)
Partially	79 (20.3)	19 (4.9)	35 (9)
*** p value < 0.01; ** p value < 0.05;			

Moreover, health literacy on preventive measures showed a strong statistically significant relationship with TPT completion ($p = 0.000$). Participants who were provided complete literacy had a higher completion rate (39.5%) compared to those who were given incomplete (13.8%) to no knowledge (7.9%).

In addition, awareness of the importance of TPT significantly influenced treatment adherence and completion ($p = 0.000$). Those with complete awareness of importance of TPT had a higher adherence (39.5%) and completion rate (42.6%), in comparison with those who had incomplete (adherence-11%, completion- 11.3%) to no knowledge (adherence -10.8%, completion- 6.7%).

D. Key Enabling and Hindering Factors Affecting Acceptability of TPT

A chi square test was run to identify potential barriers and enablers to acceptability of TPT. The table 28-34 provide statistical information on the impact of various factors on the initiation, continuation, and completion TPT. The factors are grouped under different constructs of Acceptability such as Affective Attitude, Burden, Ethicality, Intervention Coherence, Opportunity Cost, Perceived Effectiveness, and Self-Efficacy.

1. *Affective Attitude*

A statistically significant association was found between the perception of TPT as advantageous and both the initiation and continuation of TPT. Specifically, 57.2% of participants who perceived TPT as preventing TB started and continued treatment, while only 13.3% started but later dropped the therapy ($p = 0.000$). However, the perception of advantage did not significantly impact the completion of TPT ($p = 0.94$).

On the other hand, factors such as finding TPT of no use, experiencing side effects, or contracting TB despite taking TPT were strongly associated with starting and then dropping TPT ($p < 0.001$). These negative perceptions also significantly hindered the completion of TPT ($p < 0.001$).

Table 28: Affective Attitude and Acceptability of TPT

Construct	Background Characteristics	Started and continued TPT, n (%)	Started and dropped, n (%)	Completed TPT, n (%)
Affective Attitude	Motivating Factors			
	Perceived Advantage (n = 250)	0.041**	0.000***	0.94

Prevention from TB	143 (57.2)	33 (13.3)	136 (54.4)
Free of charge services	17 (6.8)	16 (6.5)	12 (4.8)
Demotivating Factors			
Perceived Disadvantage (n = 107)	0.053**	0.000***	0.000***
Found it of no use	41 (44.1)	12 (13.3)	21 (22.6)
Side effects	2 (2.2)	6 (6.7)	1 (1.1)
Got TB even after taking TPT	4 (4.3)	5 (5.6)	3 (3.2)
Other Miscellaneous Factors	9 (2.3)	3 (0.8)	1 (0.3)
***p value < 0.01; **p value < 0.05;			

2. Burden

Motivating factors such as the perceived severity of the disease and advice from doctors were significantly associated with TPT initiation and continuation ($p = 0.144$ and $p = 0.000$, respectively). The severity of the disease also positively influenced TPT completion ($p = 0.002$). On the other hand, experiencing side effects during TPT was a significant barrier to both continuation ($p = 0.000$) and completion ($p = 0.024$).

Table 29: Burden and Acceptability of TPT

Construct	Background Characteristics	Started and continued TPT, n (%)	Started and dropped, n (%)	Completed TPT, n (%)
Burden	Motivating Factors			
	Perceived drivers of the TPT (n = 193)	0.144	0.000***	0.002**
	Severity of the Disease	69 (35.8)	46 (24)	73 (37.8)
	Counselling/Doctors Advice	46 (23.8)	8 (4.2)	38 (19.7)
	Perceived Benefits	4 (2.1)	4 (1.8)	3 (1.6)
	Perceived Susceptibilities	1 (0.5)	0 (0)	1 (0.5)
	Other People's Experiences	4 (2.1)	4 (2.1)	5 (2.6)

	Demotivating Factors			
	Side effects (n = 70)	0.765	0.000***	0.024**
	Experienced side effects	44 (11.3)	35 (9.1)	43 (11)
***p value < 0.01; **p value < 0.05;				

3. Ethicality

Knowledge imparted by healthcare workers about the benefits of TPT was significantly associated with the initiation and continuation of TPT ($p = 0.001$ and $p = 0.000$, respectively). However, the completion rate was not significantly affected ($p = 0.069$). In contrast, feeling forced to take medicine negatively impacted the initiation and continuation of TPT but had no significant effect on completion.

Table 30: Ethicality and Acceptability of TPT

Construct	Background Characteristics	Started and continued TPT, n (%)	Started and dropped, n (%)	Completed TPT, n (%)
Ethicality	Motivating Factors			
	Healthcare literacy by HCW (n = 390)	0.001*	0.000*	0.069
	On Importance of TPT	134 (34.4)	55 (14.1)	138 (35.4)
	Demotivating Factors			
	Negative Reinforcement	0.326	0.352	0.578
	Felt forced to take medicine	197 (50.5)	79 (20.5)	162 (41.5)
*p value < 0.10				

4. Intervention Coherence

Active patient involvement, such as addressing queries and doubts, was crucial for the continuation of TPT ($p = 0.000$) but did not significantly impact the completion rates ($p = 0.89$ and $p = 0.052$, respectively). The lack of knowledge about whom to ask for guidance also contributed to higher dropout rates.

Table 31: Intervention Coherence and Acceptability of TPT

Construct	Background Characteristics	Started and continued TPT, n (%)	Started and dropped, n (%)	Completed TPT, n (%)
Intervention Coherence	Motivating Factors			
	Patient involvement (n = 64)	0.732	0.000***	0.89
	Had Queries	38 (9.7)	31 (8.1)	31 (7.9)
	Patient participation (n = 64)	0.714	0.000***	0.052
	Asked doubts	21 (5.4)	14 (3.7)	12 (3.1)
	Demotivating Factors			
	Didn't know whom to ask (n- 64)	11 (2.8)	9 (2.3)	11 (2.8)
***p value < 0.01;				

5. Opportunity Cost

The frequency of visits to a physician during treatment played a significant role in the continuation of TPT, with fewer visits associated with higher dropout rates ($p = 0.000$). However, this factor did not significantly affect the completion of TPT ($p = 0.605$).

Table 32: Opportunity Cost and Acceptability of TPT

Construct	Background Characteristics	Started and continued TPT, n (%)	Started and dropped, n (%)	Completed TPT
Opportunity Cost	Numbers of times met physician during treatment (n - 390)	0.088	0.000*	0.605
	1-2 times	146 (37.4)	38 (9.7)	120 (30.8)
	3-4 times	67 (17.2)	31 (7.9)	53 (13.6)
	More than 5 times	26 (6.7)	21 (5.4)	19 (4.9)
	*p value < 0.10			

6. Perceived Effectiveness

A strong association was found between the perceived benefits of the intervention and the initiation and completion of TPT ($p = 0.000$ for both). This suggests that patients who recognize the effectiveness of TPT are more likely to adhere to and complete the therapy.

Table 33: Perceived Effectiveness and Acceptability of TPT

Construct	Background Characteristics	Started and continued TPT, n (%)	Started and dropped, n (%)	Completed TPT, n (%)
Perceived Effectiveness	Motivating Factors			
		0.000***	0.201	0.000***
	Felt benefits of the intervention	184 (47.2)	59 (15.3)	158 (40.5)
*** <i>p</i> value < 0.01;				

7. Self-Efficacy

While breaks in TPT were associated with a higher likelihood of dropping out ($p = 0.000$), certain actions, such as taking a vaccine or restarting TPT post-counselling, were positively associated with the completion of TPT ($p = 0.031$).

Table 34: Self Efficacy and Acceptability of TPT

Construct	Background Characteristics	Started and continued TPT, n (%)	Started and dropped, n (%)	Completed TPT, n (%)
Self-Efficacy	Demotivating Factors			
	Break in TPT (n = 390)	0.679	0.000***	0.031**
		45 (11.5)	44 (11.4)	29 (7.4)
	How did you overcome that (n = 32)	0.852	0.792	0.446
	Dropped it	4 (12.5)	3 (9.4)	1 (3.1)
	Motivating Factors			
	Took vaccine	2 (6.3)	1 (3.1)	8 (25)
	Restarted post counselling	2 (6.3)	1 (3.1)	1 (3.1)
	Restarted without counselling	4 (12.5)	1 (3.1)	5 (15.6)
	*** <i>p</i> value < 0.01; ** <i>p</i> value < 0.05;			

Discussion

This study is first of its kind and the topic has not been explored before. It aimed to evaluate the factors influencing the acceptability of TPT among HHCs of PTB patients. It specifically focuses on socio-demographic, socioeconomic, knowledge-related, stigma-related, and accessibility factors that impact the behavioural measures of TPT acceptability (initiation, continuation, dropout, and completion of TPT). The findings also illuminate the multifaceted nature of TPT acceptability, revealing both barriers and enablers that significantly influence patient behaviours and treatment outcomes.

Key Findings

Socio-demographic Factors

The study highlights the considerable impact of socio-demographic factors on TPT acceptability. Religion emerged as a significant determinant, with non-Hindus exhibiting higher dropout rates (18.3%, $n = 390$) but also higher completion rates compared to Hindus (37.8%, $n = 390$). This suggests the presence of cultural or community-specific barriers and facilitators that may influence adherence, necessitating further investigation. Unlike other studies where age, gender, and marital status were associated with TPT completion rates, this study did not find these factors to be significant (29,34,48). However, the duration of stay at the current address and the type of residence were found to significantly influence TPT initiation and continuation, with urban residents and those with shorter stays at their current address more likely to adhere to TPT. Additionally, nuclear family structures and smaller family sizes were associated with higher TPT initiation and continuation rates, likely due to differences in decision-making processes and resource availability within these family dynamics.

Socioeconomic Factors

Socioeconomic status, particularly income and occupation, played a significant role in TPT acceptability. Among socioeconomic factors, occupation and income were significantly associated with TPT completion, closely aligning with the previous research findings where acceptability was linked with household income level (49,50). Participants

with low-skilled occupations and those above the poverty line were more likely to complete TPT. However, BPL participants had higher completion rates than APL participants. This counterintuitive result might reflect the greater perceived necessity and motivation for treatment among lower-income individuals, despite facing more significant financial barriers.

Disease-Related Stigma

The study corroborates previous research findings that stigma related to TB significantly impacts TPT acceptability. Consistent with studies from Bangladesh and elsewhere, participants who experienced stigma from neighbours exhibited higher dropout rates, while those hesitant to disclose their TB status to neighbours showed higher initiation and continuation rates (51,52).

Knowledge about TB and TPT

A study conducted among PLHIVs in Zimbabwe identified limited knowledge of TPT as a significant barrier to its acceptance (53). Similarly, another study found that the level of TB knowledge significantly influenced the willingness to accept TPT (50). These findings align with the present study, which demonstrated a robust association between TB and TPT knowledge and treatment adherence and completion. Participants with accurate knowledge of TB symptoms and transmission were more likely to initiate, continue, and complete TPT. Interestingly, even those with incorrect knowledge showed higher initiation and continuation rates, suggesting that other factors, such as perceived necessity or external influences, may also play a role in treatment adherence, warranting further investigation.

Accessibility Factors

A study conducted in Maharashtra identified healthcare accessibility challenges—including time, distance, transport, wage loss, and limited human resources—as key factors contributing to dropout before TPT initiation (27). In line with these findings, this study also highlighted the significant impact of accessibility factors, particularly geographical and financial accessibility, on TPT adherence. Participants who had to travel longer distances to DOTS centres were more likely to drop out, emphasizing the critical

role of proximity to healthcare facilities in promoting adherence. Solutions such as mobile clinics or transportation subsidies could address this barrier. Organizational accessibility, including the frequency of physician visits, was also crucial for TPT continuation. Additionally, financial accessibility played a pivotal role, with free services being associated with higher adherence rates. This underscores the importance of minimizing financial barriers and implementing financial support mechanisms in TB programs to enhance TPT adherence.

Barriers and Enablers to Acceptability

The analysis revealed key barriers and enablers to acceptability of TPT. The constructs of acceptability, such as affective attitude, burden, ethicality, intervention coherence, opportunity cost, perceived effectiveness, and self-efficacy, were all found to be significantly associated with TPT outcomes.

Enablers

In this research, several enabling factors were identified for better adherence and outcomes in TPT. Patients' recognition of TPT's advantage in preventing TB led to improved initiation and continuation rates, echoing previous findings that emphasized perceived efficacy as a key enabler (54). Disease severity and healthcare professionals' advice were significant motivators for TPT adherence, both in this study and prior research (50). Healthcare literacy provided by healthcare workers significantly improved patient knowledge and adherence, reinforcing earlier studies that showed the positive impact of health education on treatment success (53). Additionally, active patient involvement in decision-making was associated with higher initiation and completion rates, consistent with findings from various studies that revealed active patient involvement in decision-making processes improves treatment adherence (49).

Further, access to physicians and regular follow-ups were crucial for maintaining patient confidence in continuing TPT, supporting earlier research on the importance of healthcare accessibility (27). Perceived effectiveness of TPT was linked to better adherence and completion rates, while patients who restarted TPT after breaks exhibited higher self-efficacy, paralleling earlier studies that highlighted the role of self-management confidence in adherence (49,54). Lastly, access to free healthcare services facilitated

higher adherence rates, aligning with previous findings that transportation and healthcare accessibility are significant enablers (27).

Barriers

In comparison to previous studies, this research reveals various insights into the factors influencing TPT acceptance. Prior studies indicated that higher household income and occupation were positively correlated with treatment adherence (49,50). Similarly, this study found that participants with higher income and low-skilled occupations had better completion rates. However, a novel finding was that BPL (Below Poverty Line) participants demonstrated higher adherence than APL (Above Poverty Line) individuals, possibly due to a stronger perceived necessity for the treatment, contrasting with the general assumption that higher income equates to better adherence(49,50).

Stigma related to TB has consistently been reported as a key factor in higher dropout rates, especially in highly stigmatized communities (51,52). This study corroborates these findings but adds that participants who concealed their TB status from neighbours had better initiation and continuation rates, highlighting the complex interplay between stigma and treatment acceptance.

Regarding perceived disadvantages of TPT, previous studies noted concerns over side effects and doubts about efficacy as major barriers (36). Similarly, in this study, participants who perceived TPT as ineffective or harmful were more likely to drop out. Negative reinforcement, particularly feeling coerced into treatment, was also found to reduce acceptance in both prior research and this study (36).

Poor self-efficacy, another hindering factor, has been widely reported to affect adherence to chronic illness treatments (36). This study reinforces that patients who could not manage doubts or treatment breaks were less likely to complete TPT. Cultural and religious factors also played a significant role, aligning with findings from Bangladesh and other regions (51,52). In this study, non-Hindus showed higher dropout rates, suggesting that religious influences on health behaviour are a critical factor to consider in improving TPT adherence.

Conclusion

This study provides valuable insights into the factors that influence the acceptability of TPT among HHCs of pulmonary TB patients. By examining socio-demographic, socioeconomic, stigma-related, knowledge-related, and accessibility factors, the research provides a comprehensive understanding of the enablers and barriers to acceptability of by gauging behavioural outcomes (TPT initiation, continuation, dropout and completion) among different subgroups.

The findings demonstrate that socio-demographic factors, such as religion and family structure, and socioeconomic factors, including income and occupation, significantly impact TPT initiation, continuation, and completion. Disease-related stigma emerged as a substantial barrier, while knowledge about TB and TPT was strongly associated with better adherence. Accessibility factors, particularly geographical and financial barriers, also played a critical role in influencing TPT outcomes.

The study highlights the importance of context-specific interventions to address these diverse factors, offering evidence-based recommendations to improve TPT uptake and adherence, thereby contributing to more effective TB prevention strategies.

Recommendations

Based on the findings of the study, the following recommendations as been curated:

1. *Culturally Tailored Health Education and Stigma Reduction:* To enhance TPT adherence, it is essential to develop context-specific programs that address cultural beliefs, religious practices as well as stigma. These tailored interventions should focus on creating awareness, dispelling myths, and integrating cultural and religious sensitivities to reduce dropout rates and improve treatment completion. Promoting open conversations facilitated by TBHVs can help address cultural beliefs and reduce the social stigma associated with TB and TPT, fostering a supportive environment for patients. It is highly recommended to have a local TBHV. Moreover, as the knowledge base on TB and TPT evolves, it is crucial to revise health education efforts, ensuring that healthcare workers are trained to deliver clear, culturally appropriate messages. By addressing cultural beliefs, reducing stigma, and improving health education, these interventions can significantly enhance TPT adherence and treatment outcomes.

2. *Targeted Support for Rural and Mobile Populations:* Given the lower adherence rates among rural population, TPT programs should focus on improving healthcare access and awareness in rural areas. To mitigate the challenges of accessibility, which is closely linked to higher dropout rates, the introduction of mobile clinics is recommended. These mobile units can significantly reduce the travel burden for patients in remote regions, providing direct access to healthcare services and ensuring consistent treatment delivery. Additionally, enhancing health education through targeted outreach initiatives in rural communities can address knowledge gaps and further support adherence. Implementing these measures would likely improve treatment outcomes by addressing the specific barriers faced by rural and mobile populations.
3. *Family-Centric Approaches:* As perceived through the study finding, nuclear families and smaller households may have different needs and decision-making dynamics compared to joint families. Thus, tailoring TPT support to different family structures can be considered as an alternative intervention. Family counselling could help improve acceptability of TPT.
4. *Financial Support Mechanisms:* It was highly noticed among the patients that mostly adhered to treatment because of free of charge services (free ration was also a motivator). To further address socioeconomic barriers, it is crucial to offer assisted support such as providing rations to HHCs as well, particularly for individuals below the poverty line and those in low-skilled occupations. Additionally, implementing door-to-door interventions could be an effective strategy to reduce the opportunity costs associated with TPT. By bringing healthcare services directly to patients, this approach can minimize the need for frequent hospital visits, reduce wage loss, and improve access to treatment.
5. *Increase Follow-Up Frequency:* The study identified that some participants intermittently interrupted their TPT regimen, restarting it with or without medical consultation. This highlights a critical gap in treatment adherence, underscoring the need for structured and regular follow-up visits with HCWs to reinforce adherence and provide continuous support. Currently, follow-up for HHCs is limited to initial testing and treatment initiation, with medication often dispensed

for at least two weeks or more or provided via the index patient. To address this bottleneck, it is recommended that a standardized schedule for follow-up visits be established, ensuring consistent monitoring and timely intervention. This approach would enhance adherence by addressing challenges early, providing education, and reinforcing the importance of uninterrupted therapy. Regular follow-up visits could be tailored based on patient risk factors and integrated into the existing TB control programs to optimize treatment outcomes for HHCs.

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Appendix

IRB Approval



Institutional Review Board (IRB) for the Protection of Human Subjects

IORG0007355 OMB No. 0990-0279 IRB 00008833

Approved for use through June 30, 2025

Date: June 18, 2024

Institutional Review Board

Chairperson

Dr M L Jain
Retd Director, Directorate of
Medical and Health,
Swasthya Bhawan
Jaipur, India

Members

Dr Suresh Joshi
Professor, IIHMR, Jaipur

Dr Nutan Prabha Jain
Professor, IIHMR, Jaipur

Dr Anoop Khanna
Professor, IIHMR, Jaipur

Dr SV, Vinod Kumar
Professor, IIHMR, Jaipur

Mr Umesh Sarawat
Advocate, Jaipur

Dr Seema Mehta
Associate Professor, IIHMR,
Jaipur

Ms Kamaljeet Yadav,
Principal, Subodh Public
School, Sanganer, Jaipur

Alternative Members

Dr D K Mangal
Dean Research
Indian Institute of Health
Management Research,
Jaipur

Dr Rajeshwari Gupta
Retd Professor (Ob&G)

Serial No. of Institutional Review Board		June 2024	01
1	Project Title Factors Associated with Acceptability of Tuberculosis Pre-ventive Therapy Among Household Contacts of Pulmonary TB patients: A Study in Shahdara District		
2	Name of Researcher Dr Aditi Bakshi		
3	Date of Submission to the IRB	0	7
4	Date of Submission to the Agency	0	4
5	Review Category of the Proposal	2	0
	Expedited Review	2	4
	Full Review		
	Exemption from Review		
6	Date of Review	2	2
7	Reviewer's Name	0	4
	Dr M L Jain, Dr Anoop Khanna, Dr Vinod S V, Mr Umesh Sarawat, Ms Kamaljeet Yadav, Dr Seema Mehta	2	0
8	Reviewer's Feedback (Please tick the following, if you are satisfied)		2
8.1	Respect for person		4
8.2	Fair subject selection		
8.3	Informed consent		
8.4	Maintaining privacy		
8.5	Maintaining confidentiality		
9	Final Comment		
	Approved without suggestions		
	Approved with suggestions		
	Sent back for revision and re-submission		
	Not approved		
10	Suggestions	Signature	
	The suggestions are incorporated in close supervision and guidance of the Central TB Division / State and District TB officers team	 18/6/24	

Letter of Support, Central TB Division

No. Z-28015/32/2024-TB
Central TB Division
Ministry of Health and Family Welfare

Date: 12/03/2024

To,
The State TB Officer,
Delhi

Subject: Letter for support to Dr. Aditi Bakshi for conducting the study on "Factors associated with acceptability of TPT among Household contacts of pulmonary TB patients in Shahdara, Delhi".

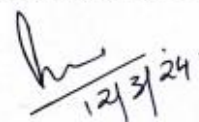
Dear Dr. Vashishat,

Dr. Aditi Bakshi is an Intern at Central TB Division, pursuing her Master of Public Health from IIHMR university, Jaipur, Rajasthan. Dr. Bakshi is mandated to conduct primary research during her internship and the subject for research is "Factors Associated with Acceptability of Tuberculosis Preventive Therapy Among Household Contacts of Pulmonary TB Patients in Shahdara district of Delhi".

Her study protocol, information note, and study tool have been thoroughly reviewed and refined, and finalized in consultation with the programme division. She would be approaching you to brief you on the project before initiating the visit to the district for data collection.

You are kindly requested to instruct the district officers to provide the necessary support in data collection and conducting the research activity.

Warm regards,



Dr. Veena Dhawan
Additional Commissioner
CVAC & CTD, Ministry of Health & Family Welfare

Copy to

1. Deputy Director General (TB), CTD
2. Dr Aditi Bakshi