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A HEALTH WORKERS' PERSPECTIVE ON TB PREVENTIVE THERAPY FOR CONTACTS OF TB PATIENTS: A CROSS-SECTIONAL STUDY FROM SOUTH WESTERN UGANDA

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Abstract

Background

Tuberculosis Preventive Therapy is the key, cost-effective Tuberculosis (TB) prevention strategy but its coverage remains sub-optimal, globally. The objective of the study was to establish factors associated with TPT prescription among PBC TB patients.

Methods

A cross-sectional study was conducted. Data was collected using a data abstraction tool and a self-administered, semi-structured questionnaire from the 17 TB diagnostic and treatment health facilities in Bushenyi district, South Western Uganda. Abstract data was analyzed in Excel for descriptive statistics. Factor analysis was done on the data collected using the questionnaire using. R Core Team, 2023 was used for the analysis.

Results

Of the 781 contacts line-listed for contact tracing, only 442 (77.1%) were prescribed TPT, which is below the 90% target. Factor analysis revealed six factors affecting TPT prescription and these are Latent TB testing, TPT service delivery, TPT financing, human resources for TPT, Monitoring, and evaluation for TPT, and health workers' attitude towards TPT. In the bivariate logistic regression analysis, perception of patient as being uncomfortable with TPT (OR 4.42 95% CI:1.87-11.7; p=0.001), low healthcare worker's knowledge of TB and TPT (OR 3.94 95% CI: 1.61-11.1; p=0.005), and negative healthcare worker's attitude towards TPT prescription (OR 4.56 95% CI: 1.28-29.2; p = 0.045) were significantly associated with low TB prescription. In multivariate logistic regression, the perception of the patient is uncomfortable with TPT (aOR 5.58 95% CI: 2.18-16.0; p = <0.001). Gaps in knowledge among healthcare workers about TB and TPT (aOR 5.97 95% CI: 2.08-19.6; p=0.002) were significantly associated with less likelihood of TPT prescription by a healthcare worker.

Conclusions

Whereas TPT is an efficient intervention for the prevention of TB, health system factors remain impediments to its implementation.

Recommendation

Studies be conducted to evaluate the impact of TPT on reducing TB incidence among contacts of PBC TB patients.

Keywords: *Tuberculosis, TB Preventive Therapy, Health worker, Perception, Attitude, Knowledge, contact tracing.*
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Introduction

Tuberculosis (TB) is an ongoing significant public health problem throughout the whole world. It is believed that a quarter of the people alive in the world have Mycobacterium tuberculosis in their bodies (WHO, 2023), which makes TB such a big burden to the world population (Bunyasi et al., 2017)). World Health Organization (WHO) reported that in 2022 alone, TB was the second killer infectious disease after coronavirus disease (COVID-19) and it killed almost twice the number of patients who died of Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome (HIV/AIDS) (WHO, 2023). Uganda is one of the high-burden TB countries with a TB incidence of 200 per 100000 population each year.

Contacts of Pulmonary bacteriologically confirmed TB (PBC) patients have a higher risk of becoming infected with TB and progressing to TB disease. In 2020, Otero et al., (2020) established that in developing countries, up to 4.4% of the contacts of PBC TB patients develop TB disease. A Ugandan implementation study by (Esther et al., 2018) reported a higher yield of TB at 6.1%, among contacts of PBC TB patients.

To prevent the infected TB contacts from progressing to TB disease, antibiotics known as Tuberculosis Preventive Therapy (TPT) are used to treat the latent TB infection. These medicines are taken as either a single medicine or

in combination for a specified duration. In the absence of effective vaccines against TB, TPT remains the single most effective, low-cost intervention used in the prevention of TB disease (WHO, 2021a).

Although TPT is a cost-effective, high-impact intervention, implementation of TPT guidelines is still low in high-burden TB countries (WHO, 2023). Globally, only two million (10%) of the targeted 20 million TB contacts were initiated on TPT between 2018 and 2020 (WHO, 2023). Uganda's National TB and Leprosy Programme (NTLP) adopted WHO consolidated guidelines for TB prevention and rolled out a TPT program for all contacts of TB patients in 2021 (MOH, 2021). The TPT is provided free of charge at all public and Private Not-For-Profit (PNFP) Diagnostic and Treatment Units (DTUs) across the country (MOH, 2021). However, the proportion of TB contacts initiated on TPT in Uganda remains very low at 6% of 2018-2021 United Nations High-Level Targets (UNHLT) (WHO, 2021a). The reasons for this low TPT prescription for TB contacts in Uganda are not well established in the available literature.

Whereas several studies have been done on TPT for PLHIV, limited studies have focused on TPT for contacts for TB patients. Additionally, the accessed literature on TPT studies done in Uganda for the reviewed period of 2014-2022 focused on patient-level factors (Ayele et al., 2015; Busari et al., 2021; Churchyard et al., 2014; Karanja et al., 2020; MOH, 2021; Teklay et al., 2016; WHO, 2020a). None focused on health workers and the health system. Therefore, this study sought to establish the factors associated with TPT prescription for contacts of PBC TB patients in Bushenyi District, South Western Uganda.

Methods

Study design and setting

This was a cross-sectional research study among healthcare workers and health facility in-charges in Bushenyi District. The study was done at all the 17 diagnostic and treatment health units of Bushenyi district, South Western Uganda. These facilities included lower-level health facilities and general district hospitals. They were also a mixture of urban and rural health facilities and public and private not-for-profit health facilities. Retrospective contact tracing cascade data on TPT for contacts was collected, targeting a complete year, July 2022 to June 2023.

Sampling and size estimation

The study targeted abstract contact tracing cascade data for the period July 2022 to June 2023 from all 17 DTUs in the Bushenyi district. For the questionnaires, we targeted all health workers at all DTUs involved in TB care and utilized a non-probability sampling method in which the respondents were conveniently accessed. With permission from the district health office, contact was made with the health workers at each facility through the health facility charge. The questionnaires were then distributed to the consenting health workers there and then. To avoid disrupting work and rushed responses, we left the questionnaires with the health workers to be responded to at their convenience time. Weekly reminders were made to health facility in-charges and the filled questionnaires were collected after four (4) weeks from the date of distribution.

Data collection and management

This research took a quantitative approach in which data was collected using two different tools; a) using a retrospective data abstraction tool and b) a self-administered, semi-structured questionnaire. All the data was collected between August and September 2023. We abstracted data for a full year, August 2022 to July 2023. We entered the data collected using the self-administered semi-structured questionnaire in Excel and cleaned it, the questionnaire responses were figuratively coded and converted into CSV format and then imported to R, a statistical software for analysis.

Data analysis

The abstracted data was entered into a Microsoft Excel sheet. The data was analyzed still in MS Excel for descriptive statistics (sums and percentages) of contacts of PBC TB patients traced at a particular health facility, contacts screened, contacts presumed with TB, contacts eligible for TPT, and finally contacts Prescribed TPT. This guide in establishing the proportions of eligible contacts of PBC TB patients prescribed with TPT in Bushenyi District, as a precursor for establishing whether there is low TPT prescription. We analyzed the data collected using the self-administered semi-structured questionnaire using R statistical software. Factor analysis was employed.

Section one of the semi-structured questionnaire was descriptively analyzed for ownership of the health facilities; gender of the respondent – male or female; training on TPT guidelines and duration elapsed since the last training was undertaken; and department where the respondents were engaged – from where they handled TB care. Section two was inferentially analyzed to assess the factors that affected TPT prescription in the Bushenyi district. Section three of the semi-structured questionnaire was also inferentially analyzed for assessing the knowledge, attitudes, and perceptions of the health workers about TPT prescription for PBC TB patients in the Bushenyi district. Both bivariate and multivariate analyses were undertaken to identify individual and a combination of predictor variables.

Managing bias

To address the potential sources of bias, data was collected from all the TB diagnostic and treatment units. The study did not set out to exclude respondents from the target group. Data was collected from all the willing respondents. A sufficient time of four weeks was given for the respondents to fill out the questionnaires at their

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convenience time. Even in data analysis, all the reported complete data was considered during the analysis.

Ethical considerations

The research was approved by the Mount Kenya University Ethics Review Committee (Approval number 1960) and the Bishop Stuart University Research Ethics Committee, (approval number BSU-REC-2013-160). An introductory letter for data collection was obtained from Mount Kenya University and the authorization letter for data collection was obtained from the Bushenyi district health office.

For confidentiality purposes, respondents' names were not collected. The data collected was not shared with any third party and was only used for academic purposes. To ensure anonymity, no respondent identification information was collected and special identifiers only were used in the final report.

The study participants were informed of their freedom to voluntarily participate in the study and of their freedom to withdraw from the study at any stage without any penalty. Further to this, respondents were informed of the importance of completing the study and that they could decline to answer any questions and/or the entire questionnaire if they objected to the contents. They were also allowed time to fill out the questionnaire at their most convenient time and place. Participants were informed that no direct benefits were to be given to those participating or denied to those who declined to participate.

Results

Data was abstracted from 15 DTUs that, at the time of access, had data on contacts of PBC TB patients for the selected period of interest. Seven hundred and eighty-one (781) contacts of confirmed PBC TB patients were elicited for contact tracing at the 15 DTUs. Figure 1. shows the contact tracing cascade for the 15 DTUs in Bushenyi District by health facility level.

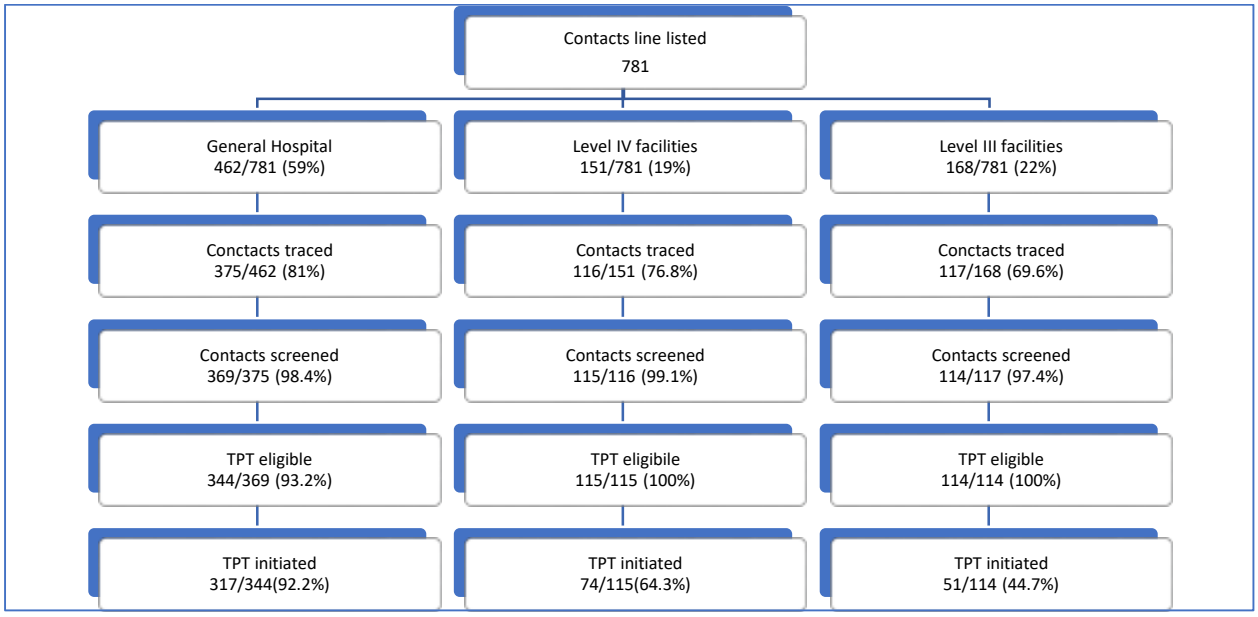

Figure 1: Contact tracing cascades for Bushenyi DTUs

Of the 781 contacts, 608 (77.8%), were done contact tracing and of those contact traced, 598 (98.4%) were screened for TB. Of those screened 573 (95.8%) were identified as eligible for TPT initiation. Of all the contacts eligible for TPT initiation, only 442 (77.1%) were prescribed TPT. Table 1 gives details of abstraction from each DTU.

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Table 1: Contact tracing cascade for Bushenyi DTUs

Health facility	Health facility level	Ownership	Contacts Traced	Contacts screened	Contacts Presumed with TB	Contacts with no signs and symptoms of TB	Contacts eligible for TPT	Contacts Prescribed TPT
Ankole Tea Health Centre (HC) III	Level III	PNFP	8	8	0	8	8	6
Bitooma HC III	Level III	PNFP	8	8	0	8	8	0
Bushenyi HC IV	Level IV	Public	84	83	0	83	83	42
Bushenyi Medical Centre HC III	Level III	PNFP	32	32	0	32	32	2
Comboni Hospital	General Hospital	PNFP	222	216	5	211	211	191
Ishaka Adventist Hospital	General Hospital	PNFP	125	125	20	105	105	100
Kampala International, University (KIU) Teaching Hospital	General hospital	PFP	28	28	0	28	28	26
Kabushaho HC III	Level III	Public	5	5	0	5	5	5
Kakanju HC III	Level III	Public	10	10	0	10	10	1
Kyabugimbi HC IV	Level IV	Public	32	32	0	32	32	32
Kyamuhunga HC III	Level III	Public	7	7	0	7	7	7
Kyeizooba HC III	Level III	Public	14	11	0	11	11	11
Nyabubare HC III	Level III	Public	7	7	0	7	7	1
Ruhumuro HC III	Level III	Public	8	8	0	8	8	0
Ryeishe HC III	Level III	Public	18	18	0	18	18	18
Totals			**608**	**598**	**25**	**573**	**573**	**442**
% Age performance				98.4%	4.2%	95.8%	95.8%	77.1%

Assessing for health system factors affecting TPT

From the 17 DTUs, out of the 220-sample population, 200 respondents were accessed as the study participants. Out of those, only 173 returned completed questionnaires and these are the questionnaires that were used in the analysis, marking an overall 87% response rate.

Of the 173 healthcare workers who returned completed questionnaires, 88 (51%) were female while 85 (49%) were male. A total of 92 (53%) worked at PNFP facilities,80 (46%) worked at public health facilities and 1 (1%) of the respondents were from a private-for-profit facility. We observed that the majority of the respondents trained in TPT were 142/173 (82%); of these, 61 (43%) had been trained in the last six months. The details of the

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baseline sociodemographic characteristics are shown in Table 2.

Table 2: Socio-demographic characteristics of the respondents and baseline characteristics of the DTUs

Baseline characteristics	Frequency (n)	Proportion (%)
Ownership		
Private-for-Profit facility	1	1%
Private-not-for-Profit	92	53%
Public health facility	80	46%
Sex		
Female	88	51%
Male	85	49%
Trained in TPT Guidelines	142	82%
Timing of TPT Guidelines training		
Within the last 6 months	61	35%
6-12 months ago,	21	12%
1-2 years	60	35%
TB prescriber status		
Direct TPT prescriber	124	72%
Indirect TPT prescriber	49	28%
Facility Level		
General hospitals	70	40%
Level IV facilities	13	8%
Level III facilities	87	50%
Level II facilities	3	2%

From the analysis, 142 (82%) participants were direct prescribers of TPT such as doctors, nurses, and midwives while 31(18%) were indirect prescribers of TPT such as counselors and auxiliary staff. Of the direct prescribers, 72 (52%) worked at a public health facility, 69(49%) worked at a private not for profit while one worked at a private-for-profit facility. 71 (50%) were male and 71 (50%). Of the direct prescribers, 120 (85%) were trained in TPT. 48 (40%) had been trained in the last six months, 20 (17%) in the past 6-12 months, and 52 (43%) in the past 1-2 years. The analysis summary is shown in Table 3.

Table 3: Showing analysis of health facilities by level and ownership, and characteristics of participants involved in TPT-related work

Baseline characteristics	Prescribed TPT, N = 142 (82%)[1]	TPT Not prescribed, N = 31 (18%)[1]	p-value[2]
Ownership			0.025
Private-for-Profit facility	1 (0.7%)	0 (0%)	
Private-not-for-Profit	69 (49%)	23 (74%)	
Public health facility	72 (51%)	8 (26%)	
Sex			0.6
Female	71 (50%)	17 (55%)	
Male	71 (50%)	14 (45%)	
Trained in TPT Guideline	120 / 142 (85%)	22 / 31 (71%)	0.075
Timing of TPT Guideline training			0.2
Within the last 6 months	48 (40%)	13 (59%)	
6-12 months ago,	20 (17%)	1 (4.5%)	
1-2 years ago,	52 (43%)	8 (36%)	
TB prescriber status			0.3

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Table 3: Showing analysis of health facilities by level and ownership, and characteristics of participants involved in TPT-related work

Baseline characteristics	**Prescribed TPT**, N = 142 (82%)[1]	**TPT Not prescribed**, N = 31 (18%)[1]	**p-value**[2]
Direct TPT prescriber	104 (73%)	20 (65%)	
Indirect TPT prescriber	38 (27%)	11 (35%)	
Facility Level			0.6
General hospitals	56 (39%)	14 (45%)	
Level IV facilities	12 (8.5%)	1 (3.2%)	
Level III facilities	72 (51%)	15 (48%)	
Level II facilities	2 (1.4%)	1 (3.2%)	

[1]n (%); n / N (%)
[2]Fisher's exact test; Pearson's Chi-squared test

The questionnaire responses were assessed for reliability and internal consistency using the Cronbach alpha and a score of 0.74 was obtained, which was above the threshold of 0.70. The details are shown in table 4.

Table 4: Showing reliability and internal consistency of the questionnaire

95% confidence boundaries

	lower	Alpha	Upper
Feldt	0.68	0.74	0.8
Duhachek	0.69	0.74	0.8

Variable	raw_alpha	std. alpha	G6(SMC)	average_r	S/N	ase	mean	sd	median_r
	Overall reliability								
	0.74	0.78	0.85	0.14	3.5	0.028	3.6	0.42	0.14
	Reliability if an item is dropped								
	raw_alpha	std. alpha	G6(SMC)	average_r	S/N	alpha se	Var. r	median_r	
X1	0.72	0.75	0.83	0.13	3.0	0.030	0.025	0.13	
X2	0.73	0.76	0.84	0.14	3.1	0.029	0.026	0.13	
X3	0.73	0.76	0.84	0.14	3.1	0.029	0.026	0.13	
X4	0.74	0.77	0.84	0.14	3.3	0.028	0.027	0.14	
X5	0.74	0.77	0.84	0.14	3.3	0.028	0.027	0.14	
X6	0.75	0.78	0.85	0.15	3.5	0.027	0.027	0.14	
X7	0.74	0.77	0.85	0.15	3.4	0.028	0.027	0.14	
X8	0.72	0.76	0.84	0.14	3.2	0.030	0.026	0.13	
X9	0.74	0.77	0.84	0.14	3.4	0.028	0.026	0.13	
X10	0.73	0.77	0.85	0.14	3.4	0.029	0.026	0.14	
X11	0.72	0.76	0.84	0.14	3.2	0.030	0.028	0.13	
X12	0.73	0.77	0.85	0.14	3.4	0.029	0.028	0.14	
X13	0.73	0.76	0.84	0.14	3.2	0.029	0.028	0.13	
X14	0.77	0.79	0.86	0.16	3.8	0.024	0.024	0.15	
X15	0.73	0.77	0.84	0.14	3.3	0.030	0.024	0.14	
X16	0.73	0.77	0.84	0.14	3.3	0.029	0.025	0.14	
X17	0.73	0.77	0.85	0.14	3.4	0.029	0.026	0.14	
X18	0.71	0.76	0.84	0.13	3.1	0.031	0.028	0.13	
X19	0.74	0.77	0.85	0.14	3.3	0.029	0.028	0.14	
X20	0.73	0.76	0.84	0.14	3.2	0.029	0.028	0.13	
X21	0.74	0.77	0.85	0.14	3.4	0.028	0.027	0.14	

Multicollinearity among the variables was assessed and the highest score was 0.74. This was below the 0.8 scores indicating no multicollinearity, thus no variable was removed. The details of the Pearson correlation analysis are shown in Figure 2.

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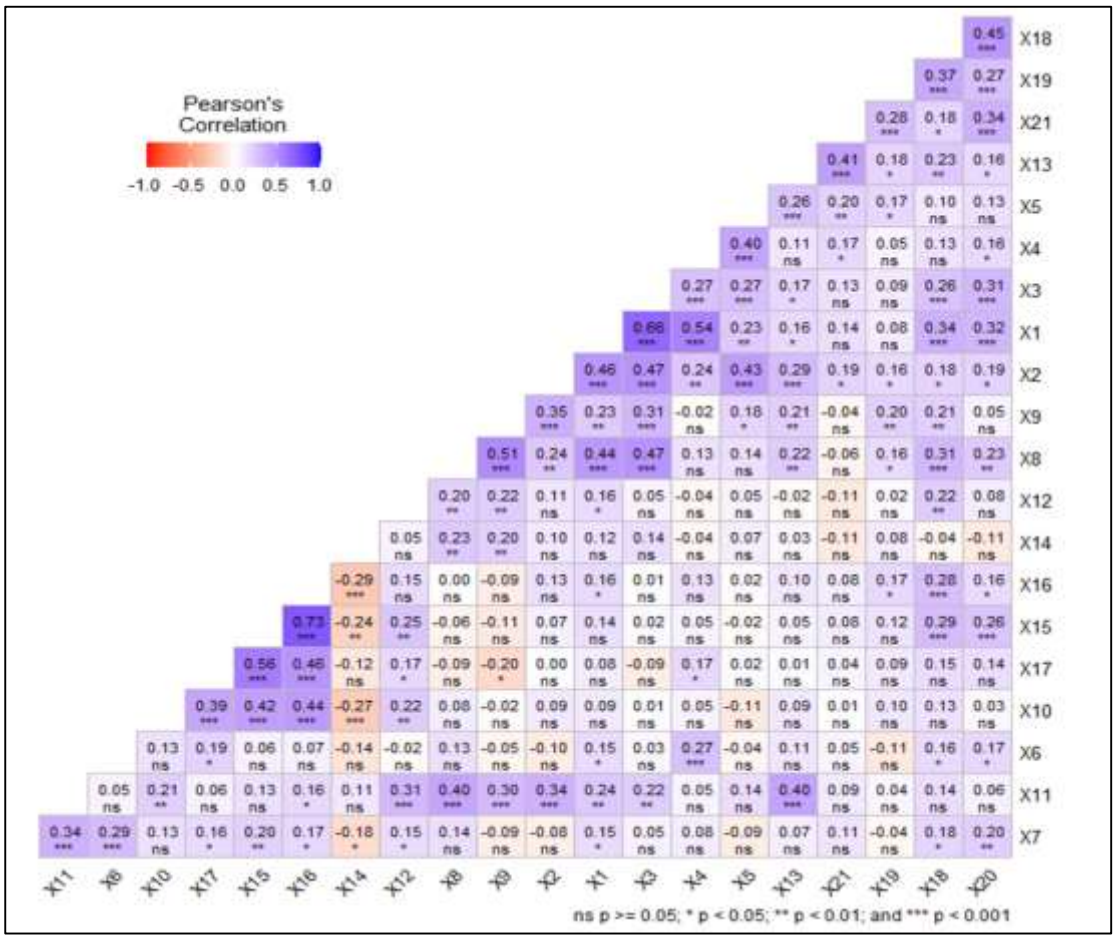

Figure 2: Showing Pearson correlation analysis

Positive Correlations: Variables indicated in purple exhibit a positive correlation coefficient ranging from 0.26 to 0.73 and bearing an asterisk (***) indicating the strength of the relationship, and suggesting a moderate positive relationship between them.

Negative Correlations: Variables X16 and X14 show a negative correlation coefficient of -0.29, indicating a moderate negative relationship (bearing asterisk ***).

No Correlation: Variables bearing an "ns" alongside the coefficients demonstrate ranges between 0.15 and -0.14, indicating a weak association.

The appropriateness of the data for factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity methods. KMO threshold is 0.6 and for Bartlett's test, a p-value of <0.05 is significant enough for factor analysis. For our study, the KMO score was 0.73, and Bartlett's test of sphericity of 2.2×10^{-16}, greenlighting for use of factor analysis. The details of the KMO analysis are shown in Table 5.

Table 5: Showing Kaiser-Meyer-Olkin and Bartlett's Test Results

Kaiser – Meyer – Olkin (KMO) Measure of Sampling Adequacy		0.73
Bartlett's test of Sphericity	Approx. Chi-Square	726.11
	Degrees of freedom	20
	Sig.(p-value)	0.000 (2.2×10^{-16})

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We then estimated the eigenvalues using the Principal Components Analysis (PCA) method for each of the 21 variables of the dataset and extracted eigenvalues that are greater than 1 (Kaiser's criterion) to represent the number of feasible factors expected in the dataset. The principal component analysis, used for extraction of factors, identified six factors with eigenvalues exceeding 1, explaining 63% of the variance. The details of the Principal Component Analysis are shown in table 6.

Table 6: Showing variables' original and extracted eigenvalues

	Initial Eigenvalues			Extracted Eigenvalues		
Component	**Total**	**%ge of variance**	**Cum %ge**	**Total**	**%ge of variance**	**Cum %ge**
1	4.242	20.2	20.2	4.242	20.2	20.2
2	2.921	13.9	34.1	2.921	13.9	34.1
3	1.769	8.4	42.5	1.769	8.4	42.5
4	1.549	7.4	49.9	1.549	7.4	49.9
5	1.403	6.7	56.6	1.403	6.7	56.6
6	**1.271**	**6.1**	**62.7**	**1.271**	**6.1**	**62.7**
7	0.937	4.5	67.2			
8	0.898	4.3	71.5			
9	0.821	3.9	75.4			
10	0.678	3.2	78.6			
11	0.660	3.1	81.7			
12	0.576	2.7	84.4			
13	0.503	2.4	86.8			
14	0.490	2.3	89.1			
15	0.430	2.0	91.1			
16	0.422	2.0	93.1			
17	0.356	1.7	94.7			
18	0.339	1.6	96.4			
19	0.314	1.5	97.9			
20	0.218	1.0	98.9			
21	0.204	1.0	99.9(100)			

A parallel analysis scree plot was done, and it showed that 6 factors were feasible as the latent possible factors. We further undertook a rotation of the variables using the oblique-promax method. Parallel analysis indicated that six factors surpassed the obtained eigenvalue. The details of the parallel scree plot are shown in Figure 3.

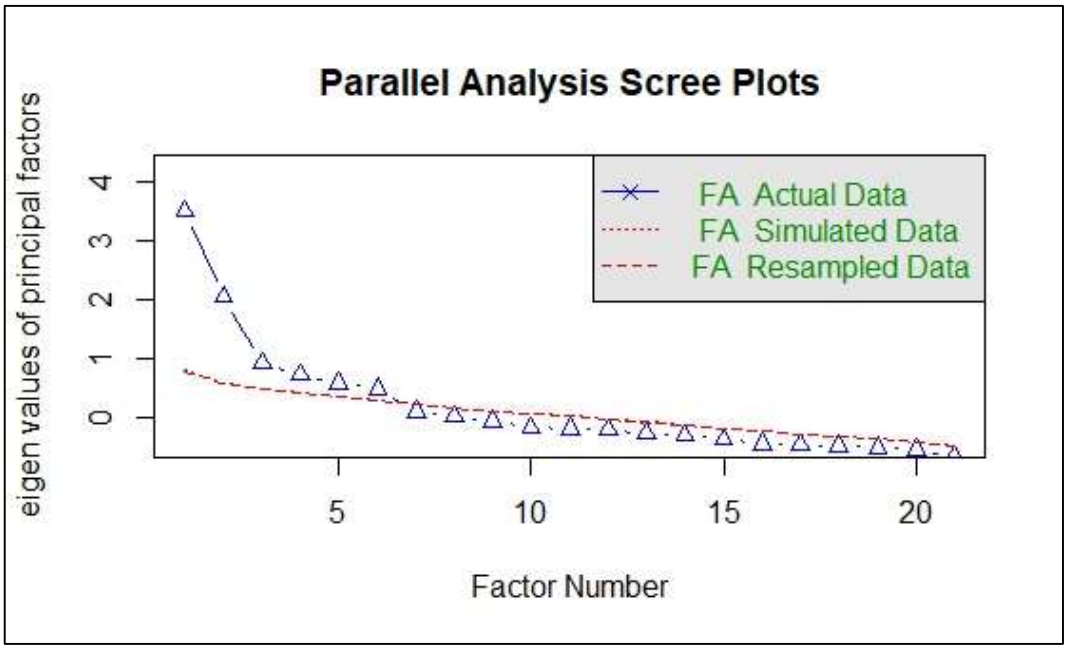

Figure 3:Parallel analysis scree plots

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Therefore, from this study, six health system factors affecting TPT prescription for contacts of PBC TB patients in the Bushenyi district were identified and these are; latent TB testing, TPT service delivery, TPT financing, human resources for TPT, Monitoring and evaluation for TPT, Health workers' attitude towards TPT.

Establishing the knowledge, perceptions, and attitude factors among healthcare workers affecting TPT prescription in Bushenyi district, South Western Uganda

Both bivariate and multivariate analyses were undertaken to identify individual and a combination of predictor variables. The odds ratio (OR) was preferred. In assessing the knowledge, attitudes, and perceptions, we considered 8 variables: sex of the respondent, insufficient training in TPT guidelines, perception of a patient, gaps in knowledge of the usefulness of TPT, stigma towards prescription, negative attitudes towards TPT, facility level, and indirectness of a health worker in TPT prescription. A notion conceived that given a particular variable considered, would a health worker prescribe TPT for an eligible client? Thus, the Odds ratio seemed the best choice. For example, having the guidelines in place, and the relevant training about TPT, it would be assumed that a trained healthcare worker would undertake TPT prescriptions for all eligible clients. However, TPT prescription has consistently remained below the recommended level of at least 90% of all the eligible contacts (WHO, 2023). Therefore, determining the factors affecting TPT prescription alone might not fully expose the intricate nature of the problem at hand. Due to the nature of the study – cross-sectional, and focused more on the quantitative determination, the odds ratio was used, to estimate the likelihood of having a TPT prescription occurring considering several variables. Both for the bivariate and multivariate analyses, the 95 CI and the p-values were determined, and the p-values of the variable, ORs were considered for the significance of the variables. A combination of Likert-type questions (5-level scale) and close-ended questions was used to assess the knowledge, attitudes, and perceptions of the healthcare workers about TPT prescription.

In the bivariate logistic regression analysis, perception of patient as being uncomfortable with TPT (OR 4.42 95% CI:1.87-11.7; p=0.001), low healthcare worker's knowledge of TB and TPT (OR 3.94 95% CI: 1.61-11.1; p=0.005), and negative healthcare worker's attitude towards TPT prescription (OR 4.56 95% CI: 1.28-29.2; p = 0.045) were significantly associated with low TB prescription (see table 4).

Table 4 Showing Bivariate logistic regression analysis for Low TPT prescription among health workers in Bushenyi district

	Bivariate			
Predictor	N	OR[1,2]	95% CI[2]	p-value
Sex	173			
Female		—	—	
Male		0.82	0.37, 1.79	0.6
Insufficient training in TPT Guideline	173	2.23	0.88, 5.39	0.080
Perception of patient	173	4.42**	1.87, 11.7	0.001
Gaps in knowledge of HCW	173	3.94**	1.61, 11.1	0.005
Stigma towards TPT prescription	173	1.56	0.26, 29.6	0.7
Negative attitudes towards TPT	173	4.56*	1.28, 29.2	0.045
Level II/III facilities	173	0.98	0.45, 2.15	>0.9
Indirect TPT prescriber	173	1.51	0.64, 3.39	0.3

[1]*p<0.05; **p<0.01; ***p<0.001
[2]OR = Odds Ratio, CI = Confidence Interval

However, in the multivariate logistic regression, the perception of the patient is uncomfortable with TPT (aOR 5.58 95% CI: 2.18-16.0; p = <0.001). Gaps in knowledge among healthcare workers about TB and TPT (aOR 5.97 95% CI: 2.08-19.6; p=0.002) were significantly associated with less likelihood of TPT prescription by a healthcare worker (see Table 5).

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Table 5 Showing Multivariate logistic regression analysis for Low TPT prescription among health workers in Bushenyi district

Predictor	p-value	Multivariable OR	95% CI[2]	p-value
Sex				
Female		—	—	
Male	0.6	1.17	0.45, 3.08	0.7
Insufficient training in TPT Guideline	0.080	1.16	0.39, 3.27	0.8
Perception of patient	0.001	5.58***	2.18, 16.0	<0.001
Gaps in knowledge of HCW	0.005	5.97**	2.08, 19.6	0.002
Stigma towards TPT prescription	0.7	3.22	0.40, 70.3	0.3
Negative attitudes towards TPT	0.045	4.16	1.07, 27.9	0.073
Level II/III facilities	>0.9	1.05	0.43, 2.61	>0.9
Indirect TPT prescriber	0.3	1.45	0.55, 3.73	0.4

Discussion

In this study, it was established that TPT prescription for eligible contacts among the 781 line-listed contacts of PBC TB patients was low at 77.1% compared with the WHO target of 90%. In Uganda, the guidelines for programmatic management of latent TB infections were rolled out in March 2021 (MOH, 2021). These guidelines guide healthcare workers on TPT service delivery. Therefore, the 77.1% TPT coverage in the study area, arising out of a contact tracing coverage of 77.8%, was an unexpected result. However, this is not surprising because in a similar Ugandan setting, though in an urban location, contact tracing was relatively low at 58.5% (Baluku et al., 2021). Contact tracing is an important first step of the TPT care cascade and any low levels imply missed opportunities for treatment of latent TB infection (Szkwarko et al., 2017a). This implies increased missed opportunities for the prevention of the progression of TB infection to TB disease and thus increased risk of the spread of TB disease. Reichler et.al, in a prospective study in the United States of America and Canada found that 9.8% of the contacts who were not treated with TPT progressed to TB disease, 1.8% of the contacts that were partially treated with TPT progressed to TB disease while only 0.2% of those who completed TPT progressed to TB disease (Reichler et al., 2020).

Six factors affecting TPT prescription for contacts of PBC TB patients were revealed, and these are, in their order of significance: TPT service delivery, Latent TB testing, TPT financing, human resources for TPT, Monitoring and evaluation for TPT, and health workers attitude towards TPT.

In this study, healthcare worker attitudes towards TPT came out as the least significant factor contributing to the presence of low TPT prescription. However, all the six building blocks of a health system (World Health Organization., 2010) are represented in these revealed factors as barriers to low TPT prescription in the study area. These results are not surprising for this study setting, Uganda being one of the 30 highly-burdened TB/HIV countries globally (WHO, 2020b, 2021a, 2021b, 2023). The barriers constraining TPT implementation are exacerbated by the lack of adequate financing prompting diversion from concentrating on TB and TPT to other health priorities (Oxlade et al., 2021; Wynne et al., 2014)

In this study, the knowledge gap on TB and TPT among healthcare workers (aOR 5.97 95% CI 2.08–19.6; p = 0.002) and perception of patients being uncomfortable with TPT (aOR 5.58 95% CI: 2.18–16; p <0.001) were realized as significant among other tested variables. Furthermore, negative healthcare workers' attitudes towards TPT prescription (OR 4.56 95% CI: 1.28-29.2; p = 0.045) were also significantly associated with low TB prescription. Knowledge gap and the negative perception of healthcare workers came out strongly significant for both analyses indicating a high likelihood of these barriers happening among the respondents in the study area. Negative attitudes, while appearing only in the bivariate analysis, had a strong odds ratio and equally a high likelihood of being present among the study respondents. This suggests that healthcare workers who are not well trained in TB and TPT guidelines, and who have negative attitudes towards TPT are less likely to prescribe TPT to eligible clients. It is imperative, therefore, that all healthcare workers involved in TB care and TPT prescription, have full knowledge of the current guidelines, and have had adequate training and education on the TB and TPT guidelines, to carry out TPT implementation adequately.

The knowledge gap is related to healthcare workers' perceptions and attitudes toward service provision (Baloyi et al., 2022; Falzon et al., 2022; Singh et al., 2017; Szkwarko et al., 2017a, 2017b). This is true with TPT prescription in this study.

This finding agrees with the South African cross-sectional study on factors affecting TPT prescription for HIV patients which established that perception among health workers of poor patient comfort with TPT disclosure (p = 0.01), insufficient TPT training (p = 0.04), and inadequate isoniazid supplies (p = 0.04) were significantly associated with lower prescription rates (Ahmed et al., 2021)

Generalizability

As this study focused only on selected health facilities using non-probability sampling techniques, results may not be generalized. However, the selected facilities covered all levels of primary health care facilities in Bushenyi district, South Western Uganda, including district hospitals, health centers, and not-for-profit health facilities.

Conclusion

This study found that the proportion of contacts of PBC TB patients that were prescribed TPT in the Bushenyi district was very low at 77.1% when compared with the MOH-NTLP and WHO target of 90%. Six health system factors affecting TPT prescription for contacts of PBC TB patients were revealed, and these are Latent TB testing, TPT service delivery, TPT financing, human resources for TPT, Monitoring and evaluation for TPT, and healthcare workers' attitude towards TPT. Furthermore, knowledge gap on TB and TPT among healthcare workers (aOR 5.97 95% CI 2.08–19.6; p = 0.002), perception of patient being uncomfortable with TPT (aOR 5.58 95% CI: 2.18–16; p <0.001) and negative healthcare workers' attitude towards TPT prescription (OR 4.56 95% CI: 1.28-29.2; p = 0.045) were significantly associated with low TB prescription during this study.

Limitations

In the retrospective review of records of contact tracing, the contact tracing register did not have a provision for documenting reasons for not prescribing TPT for the eligible contacts of PBC TB patients. Additionally, this research focused on healthcare workers (both trained health workers and health system managers) and TPT commodities, as essential pillars of a health system. The study participants and sample size in the study area are limitations since the district has a finite number of health workers. Not all the targeted respondents were available, reachable, and willing to participate at the time of collecting data. This may limit the generalization of findings from this study.

This research focused on TPT for contacts. Whereas TPT among PLHIV is widely studied, not much attention has been given to TPT for contacts. The absence of many studies on the TPT for contacts in Uganda affected the comparability of the findings from this study.

Recommendations

It is recommended that studies be conducted to evaluate factors that affect TPT uptake, adherence to TPT, and the impact of TPT on reducing TB incidence among contacts of PBC TB patients in Bushenyi. Further studies should also be conducted among the patients to understand the acceptability of TPT among patients as well as the perceptions of patients regarding TPT.

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LIST OF ABBREVIATIONS AND ACRONYMS

COVID-19: Corona Virus Disease
DTU: Diagnostic and Treatment Units
DHO: District Health Officer
HC: Health Centre
HSD: Health Sub-District
HCW: Healthcare workers
HIV/AIDS: Human Immunodeficiency Virus /Acquired Immunodeficiency Syndrome
KMO: Kaiser-Meyer-Olkin
KIU: Kampala International, University
MoH: Ministry of Health
M&E: Monitoring and Evaluation
NTLP: National TB and Leprosy Programme
OR: Odds Ratio
OPD: Outpatient Department
PLHIV: People living with HIV
PCA: Principal Components Analysis
PNFP: Private Not-For-Profit
PFP: Private-for Profit
PBC: Pulmonary Bacteriologically Confirmed
3HP: Rifapentine Isoniazid
TPT: Tuberculosis Preventive Therapy
UNHLT: United Nations High-Level Targets
WHO: World Health Organization

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Conflict of interest

The authors had no conflict of interest to declare.

References

1) Ahmed, A. A., Grammatico, M., Moll, A. P., Malinga, S., Makhunga, P., Charalambous, S., Ladines-Lim, J. B., Jones, J., Choi, K., & Shenoi, S. V. (2021). Factors associated with low tuberculosis preventive therapy prescription rates among health care workers in rural South Africa. *Global Health Action*, *14*(1). https://doi.org/10.1080/16549716.2021.1979281
2) Ayele, H. T., Van Mourik, M. S. M., Debray, T. P. A., & Bonten, M. J. M. (2015). Isoniazid prophylactic therapy for the prevention of tuberculosis in HIV infected adults: A systematic review and meta-analysis of randomized trials. *PLoS ONE*, *10*(11), 1–16. https://doi.org/10.1371/journal.pone.0142290
3) Baloyi, D. P., Anthony, M. G., Meyerson, K. A., Mazibuko, S., Wademan, D., Viljoen, L., Myburgh, H., du Preez, K., Osman, M., Hirsch-Moverman, Y., Charalambous, S., Hausler, H., Hesseling, A. C., & Hoddinott, G. (2022). Reasons for poor uptake of TB preventive

therapy in South Africa. *Public Health Action*, *12*(4), 159–164. https://doi.org/10.5588/pha.22.0030

4) Baluku, J. B., Kabamooli, R. A., Kajumba, N., Nabwana, M., Kateete, D., Kiguli, S., & Andia-Biraro, I. (2021). Contact tracing is associated with the treatment success of index tuberculosis cases in Uganda. *International Journal of Infectious Diseases*, *109*, 129–136. https://doi.org/10.1016/j.ijid.2021.06.049
5) Bunyasi, E. W., Schmidt, B. M., Abdullahi, L. H., Mulenga, H., Tameris, M., Luabeya, A., Shenje, J., Scriba, T., Geldenhuys, H., Wood, R., & Hatherill, M. (2017). Prevalence of latent TB infection and TB disease among adolescents in high TB burden countries in Africa: A systematic review protocol. *BMJ Open*, *7*(3). https://doi.org/10.1136/bmjopen-2016-014609
6) Busari, A. A., Oshikoya, K. A., Adejumo, I. A., Olanrewaju, O. A., Usman, S. O., Badru, W. A., Oreagba, I. A., & Olayemi, S. O. (2021). Low prevalence of isoniazid preventive therapy uptake among HIV-infected patients attending tertiary health facility in Lagos, southwest Nigeria. *Pan African Medical Journal*, *39*(123), 1–11. https://doi.org/10.11604/pamj.2021.39.123.28095
7) Churchyard, G. J., Chaisson, R. E., Maartens, G., & Getahun, H. (2014). Tuberculosis preventive therapy: An underutilized strategy to reduce individual risk of TB and contribute to TB control. *South African Medical Journal*, *104*(5), 339–343. https://doi.org/10.7196/SAMJ.8290
8) Esther, K., Sensalire, S., Muhire, M., Kisamba, H., Byabagambi, J., Rahimzai, R. M., Mugabe, F., Upentho, G., Calnan, J., Seyoum, D., & Birabwa, E. (2018). Improving TB case notification in northern Uganda: evidence of a quality improvement-guided active case finding intervention. *BMC Health Services Research*, *2*, 1–12.
9) Falzon, D., den Boon, S., Kanchar, A., Zignol, M., Migliori, G. B., & Kasaeva, T. (2022). Global reporting on tuberculosis preventive treatment among contacts. In *European Respiratory Journal* (Vol. 59, Issue 3). European Respiratory Society. https://doi.org/10.1183/13993003.02753-2021
10) Karanja, M., Kingwara, L., Owiti, P., Kirui, E., Ngari, F., Kiplimo, R., Maina, M., Masini, E., Onyango, E., & Ngugi, C. (2020). Outcomes of isoniazid preventive therapy among people living with HIV in Kenya: A retrospective study of routine health care data. *PLoS ONE*, *15*(12 December), 1–14. https://doi.org/10.1371/journal.pone.0234588
11) MOH. (2021). *Programmatic Management of Latent TB Infection in Uganda "Closing the TB Tap" A Health Worker Guide*. *March*, 11. www.health.go.ug
12) Otero, L., Battaglioli, T., Ríos, J., De la Torre, Z., Trocones, N., Ordoñez, C., Seas, C., & Van der Stuyft, P. (2020). Contact evaluation and isoniazid preventive therapy among close and household contacts of tuberculosis patients in Lima, Peru: an analysis of routine data. *Tropical Medicine and International Health*, *25*(3), 346–356. https://doi.org/10.1111/tmi.13350
13) Oxlade, O., den Boon, S., Menzies, D., Falzon, D., Lane, M. Y., Kanchar, A., Zignol, M., & Matteelli, A. (2021). TB preventive treatment in high- And intermediate-incidence countries: Research needs for scale-up. *International Journal of Tuberculosis and Lung Disease*, *25*(10), 823–831. https://doi.org/10.5588/ijtld.21.0293
14) Reichler, M. R., Khan, A., Sterling, T. R., Zhao, H., Chen, B., Yuan, Y., Moran, J., McAuley, J., & Mangura, B. (2020). Risk factors for tuberculosis and effect of preventive therapy among close contacts of persons with infectious tuberculosis. *Clinical Infectious Diseases*, *70*(8), 1562–1572. https://doi.org/10.1093/cid/ciz438
15) Singh, A. R., Kharate, A., Bhat, P., Kokane, A. M., Bali, S., Sahu, S., Verma, M., Nagar, M., & Kumar, A. M. V. (2017). Isoniazid preventive therapy among children living with tuberculosis patients: Is it working? A mixed-method study from Bhopal, India. *Journal of Tropical Pediatrics*, *63*(4), 274–285. https://doi.org/10.1093/tropej/fmw086
16) Szkwarko, D., Hirsch-Moverman, Y., Du Plessis, L., Du Preez, K., Carr, C., & Mandalakas, A. M. (2017a). Child contact management in high tuberculosis burden countries: A mixed-methods systematic review. *PLoS ONE*,*12*(8), 4. https://doi.org/10.1371/journal.pone.0182185
17) Szkwarko, D., Hirsch-Moverman, Y., Du Plessis, L., Du Preez, K., Carr, C., & Mandalakas, A. M. (2017b). Child contact management in high tuberculosis burden countries: A mixed-methods systematic review. *PLoS ONE*,*12*(8), 1–23. https://doi.org/10.1371/journal.pone.0182185
18) Teklay, G., Teklu, T., Legesse, B., Tedla, K., & Klinkenberg, E. (2016). Barriers in the implementation of isoniazid preventive therapy for people living with HIV in Northern Ethiopia: A mixed quantitative and qualitative study. *BMC Public Health*, *16*(1), 1–9. https://doi.org/10.1186/s12889-016-3525-8
19) WHO. (2020a). Consolidated Guidelines on Tuberculosis Treatment. In *Who*.
20) WHO. (2020b). WHO report on TB 2020. In *Who* (Vol. 1, Issue 1).

21) WHO. (2021a). WHO consolidated guidelines on tuberculosis. Module 1: Prevention. Tuberculosis preventive treatment. In *Tuberculosis, Lung Diseases, HIV Infection* (Issue 2). https://doi.org/10.30978/tb2021-2-86
22) WHO. (2021b). *WHO global lists of high-burden countries for tuberculosis (TB), TB / HIV, and TB (MDR / RR-TB)*. 2021–2025. http://apps.who.int/bookorders.%0Ahttps://cdn.who.int/media/docs/default-source/hq-tuberculosis/who_globalhbcliststb_2021-2025_backgrounddocument.pdf
23) WHO. (2023). *WHO Global TB Report 2023*.
24) World Health Organization. (2010). *Monitoring the building blocks of health systems : a handbook of indicators and their measurement strategies*. 92.
25) Wynne, A., Richter, S., Banura, L., & Kipp, W. (2014). Challenges in tuberculosis care in Western Uganda: Health care worker and patient perspectives. *International Journal of Africa Nursing Sciences*, *1*, 6–10. https://doi.org/10.1016/j.ijans.2014.05.001

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