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FACILITY-RELATED FACTORS CONTRIBUTING TO THE PREVALENCE OF TB CO-INFECTION AMONG HIV PATIENTS IN SOROTI REGIONAL REFERRAL HOSPITAL IN SOROTI DISTRICT. A CROSS-SECTIONAL STUDY.

Mercy Akello, Sharipher Nabukenya*
Kampala School of Health Sciences.

Abstract

Background

Tuberculosis infection is a chronic infectious disease caused by Mycobacterium tuberculosis. Facility-related factors play a crucial role in the transmission and management of tuberculosis (TB). Therefore, this study aimed at accessing the facility-related factors contributing to the prevalence of TB co-infection among HIV patients in Soroti Regional Referral Hospital in Soroti district.

Methodology

A cross-sectional study design, then a simple random technique as the sampling technique. Data was collected from a sample size of 50 respondents using a semi-structured questionnaire and analyzed using Excel, presented in tables and figures with narratives.

Results

50 respondents participated in the study**,** 56% were females, and 44% were males. 40% were aged 48-57 whereas the least 60% were aged 18-27 years. 60% had ever missed an ART appointment in the past three months, (58%) had tested for TB infection twice in a period of one year, (64%) reported that after the onset symptoms of TB, they self-medicated and (72%) reported > 10 KM as the distance from their homes to the health facility.

Conclusion

The prevalence of TB co-infection among HIV/AIDS patients was due to poor health-seeking behaviors, multi-drug resistance, self-medication, and long distances to the facility.

Recommendation

Soroti Regional Referral Hospital administration should intensively continue to emphasize HIV/AIDS patients to seek timely diagnosis and treatment to reduce the reduction of co-infection and drug resistance during ART services.

Keywords; *Tuberculosis co-infection,,Soroti Regional Referral Hospital, Soroti District.*
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Corresponding Author: Sharipher Nabukenya
Email: sshipher@gmail.com
Kampala School of Health Sciences.

Background of the study

Tuberculosis infection is a chronic infectious disease caused by Mycobacterium tuberculosis. An estimated global total of 10.6million people fell ill with TB in 2022 equivalent to 133 incident cases per 100,000 populations. Among all incident cases, 6.3% were among people living with HIV. Most cases in 2022 were in WHO regions of South East Asia(46%), Africa(23%) and the Western Pacific(18%), with smaller shares in the Eastern Mediterranean(8.1%), the Americas(3.1%) and Europe(2.2%) (WHO, 2023).

In 2022, 2.5 million people in Africa became ill with TB, which was a quarter of all new TB cases globally. An estimated 424,000 people died from TB in Africa in 2022. Between 2010 and 2022, 10 million lives were saved in Africa through TB diagnosis and treatment. From 2015 - 2022, TB incidence in Africa fell by 8.7%, while globally it fell by 23% (UNAIDS, 2023).

Overall, the pooled prevalence of TB/HIV co-infection in Nigeria was 25.8%. The highest co- infection prevalence of 34.3% was recorded among the North Central States of Nigeria, while the least prevalence of 19.3% was recorded among the Southeastern states of Nigeria. There was a paucity of published articles from the Northeastern states of Nigeria (Eleazar et al., 2021).

In East Africa, the United Republic of Tanzania is one of the 30 highest tuberculosis burden countries in the world. In 2021, the estimated TB incidence was 208 per 100,000 populations which

corresponded to an estimated number of TB cases of 132,000. TB mortality was established at 29 per 100 000 population in HIV-negative people and 12 per 100 000 population in HIV-positive people (the United Republic of Tanzania Ministry of Health National Tuberculosis and Leprosy program, 2023).

Uganda is one of the world's thirty high-burden countries for TB/HIV co-infection. Each year, approximately 91,000 people in Uganda get sick of TB with 32% of them being HIV-infected. In 2019, the estimated incidence rate for TB was 200 per 100,000 population occurred accounting for
1.4 million in Uganda (UNAIDS, 2022). Therefore, this study aimed at accessing the facility-related factors contributing to the prevalence of TB co-infection among HIV patients in Soroti Regional Referral Hospital in Soroti district.

Methodology

Study design

This study employed a descriptive cross-sectional design to generate possible ideas to formulate a realistic and testable hypothesis on quantitative data. The design was preferred for this study because the design produces statistical outcomes, it can also be used as secondary data for another research study.

Study area

Soroti Regional Referral Hospital, popularly known as Soroti Hospital, is a public health facility located in the heart of Soroti city in Eastern Uganda. Established in the mid-1920s as a treatment center for syphilis, the hospital has grown into a major referral hospital serving the districts of Amuria, Bukedea, Kaberamaido, Kapelebyong, Katakwi, Kumi, Ngora, Serere, and Soroti. With a bed capacity of 274, Soroti Hospital offers free general care to patients and is one of the 13 Regional Referral Hospitals in Uganda Soroti Regional Referral Hospital (RRH) is located 320 kilometers northeast of Kampala.

Study population

This comprised of HIV patients with TB seeking medical services in ART Clinic, Soroti Regional Referral Hospital, Soroti district present during the period of data collection.

Sample size determination

Sample size determination was defined as the number of items to be selected from the universe to constitute a sample. The sample size was calculated using Burton's formula (1905).
S=2(QR) O: Where
S=required sample size
Number of days the researcher spent collecting data
]R=maximum number of people per day
Maximum time the interviewer spent on each participant.
2*5*5*1hr =50
Therefore, the researcher used 50 respondents.

Sampling technique

A simple random technique was used to select the study participants from the source population. The rationale for choosing this technique was to avoid bias and its findings were generated for the study population since each respondent had an equal chance of being selected for the sample.

Sampling procedure

During the simple random sampling technique, the qualifying participants were first selected. Then 10 equally sized pieces of paper were cut, 5 pieces of paper had 'yes' and 5 pieces were written 'no'. The pieces of paper were folded uniformly and put in a container, and then each participant one at a time was invited to pick a paper. Those who picked NO were thanked and released and those who picked YES were congratulated and allowed to participate in the study. The study took one month to make 50 respondents.

Data collection method

The method for collecting data was questionnaire. This was used for the purpose of collecting primary quantitative data. This study used structured questionnaire with both open ended and closed ended questions developed on the basis of literature review.

Data collection tools

The questionnaire was divided into main areas of investigation, sub-sections organized according to the research objectives. The respondents were advised to tick the appropriate response as a way to express their views and opinions.

Data collection procedure

The researcher sought approval from the supervisor of the institution, then further sought approval from Hospital administration. The researcher then proceeded to the ART unit to seek consent of the respondents. The questionnaire was given directly to those who agreed to take part in the exercise and collected back for analysis.

Study variables

Dependent variable

The dependent variable was Tuberculosis co-infection among HIV patients.

Independent variables

Independent variables were the health facility-related factors contributing to the prevalence of TB co-infection among HIV patients.

Quality control

The researcher carried out a pre-test using a questionnaire that was done on 15 respondents in Soroti Regional Referral Hospital, Soroti District. The researcher trained research assistants to
ensure no bias and clear explanation and interpretation of questions during data collection. The researcher had clear inclusion and exclusion criteria.

Inclusion criteria

All HIV/AIDS patients with TB co-infection 18 -67 years at the ART clinic who were ready to consent were given a consent form.

https://doi.org/10.71020/jwhr.v2i2.17
Original Article

Exclusion criteria
All HIV/AIDS patients with TB co-infection who were 18 -67 years old receiving ART at Soroti Regional Referral Hospital who didn't appear on the for-data collection were excluded.

Data analysis and presentation

The data was processed and analyzed using excel and the findings were presented in logical, statistical forms such as frequency table figures and pie-charts after confirming accuracy, consistency, legibility of data.

Ethical consideration
The permission to carry out research was sought from the principal of Kampala School of Health sciences and supervisor. Permission was sought from the administrator Soroti Regional Referral Hospital. Confidentiality and privacy of the respondents was ensured by requesting them not to indicate their names or any identity on the questionnaire. Consent of the sampled respondents was sought before the interview using standard consent forms.

Informed consent
All the participants consented to the study.

Results

Table 1 shows the distribution of respondents according to demographic data (N=50)

Variables	Frequency (f)	Percentage (%)
Gender		
Female	28	56
Male	22	44
Total	**50**	**100**
Age (years)		
18-27	03	6
28-37	09	18
38-47	10	20
48-57	20	40
58-67	08	16
Total	**50**	**100**
Religion		
Anglican	15	30
Catholic	18	36
Muslim	5	10
Pentecostal	10	20
Others	2	4
Total	**50**	**100**
Marital status		
Single	8	16
Married	29	58
Divorced	7	14
Widowed	6	12
Total	**50**	**100**
Education level		
Never went to school	10	20
Primary	15	30
Secondary	16	32
Institution/ university	9	18
Total	**50**	**100**
Type of TB infection		
Pulmonary TB	31	62
Extra Pulmonary	18	36
I don't know	01	2
Total	**50**	**100**

N=50, Primary data (2024)

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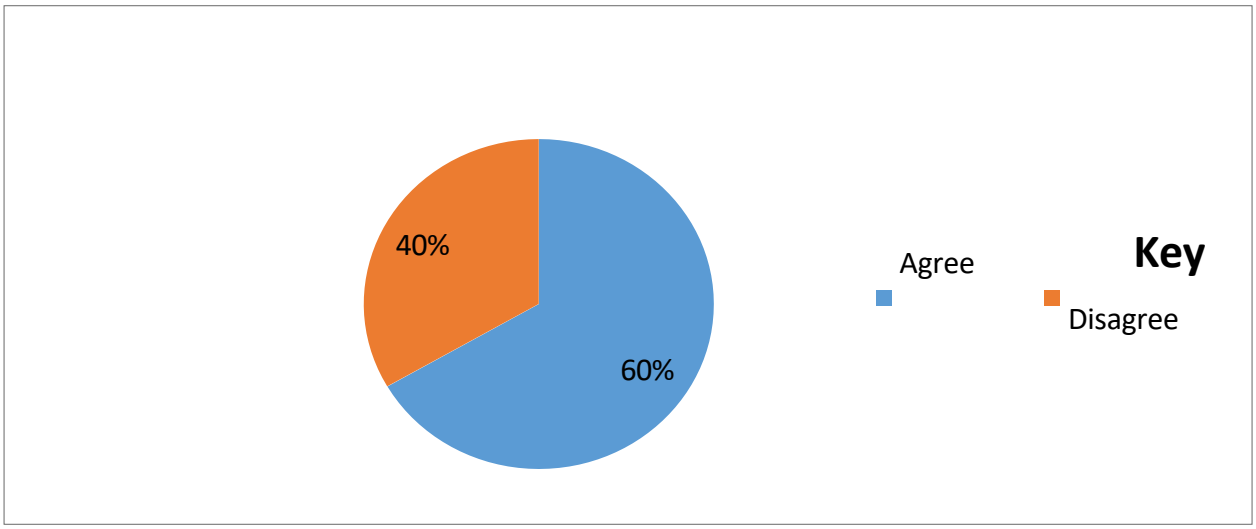
From the study findings, more than of the respondents (56%) were females whereas the least (44%) were males by sex.
Study results from respondent's years of age revealed that most of the respondents (40%) were within the age bracket of aged 48-57 years whereas the least (6%) were aged 18-27 years.
The study discovered that most of the respondents (36%) were Catholics by religion whereas the least (4%) were from other religions such as Adventists.
The study further revealed that more than a half (58%) of the respondents were married whereas the least (2%) were widowed.
In regards to education levels, the study findings revealed that most of the respondents (32%) attained secondary level of education whereas the least had (18%) had attained institutional/ university level of education.
The study findings showed that the majority of the respondents (62%) had pulmonary TB whereas the minority (2%) didn't know the type of TB they had.

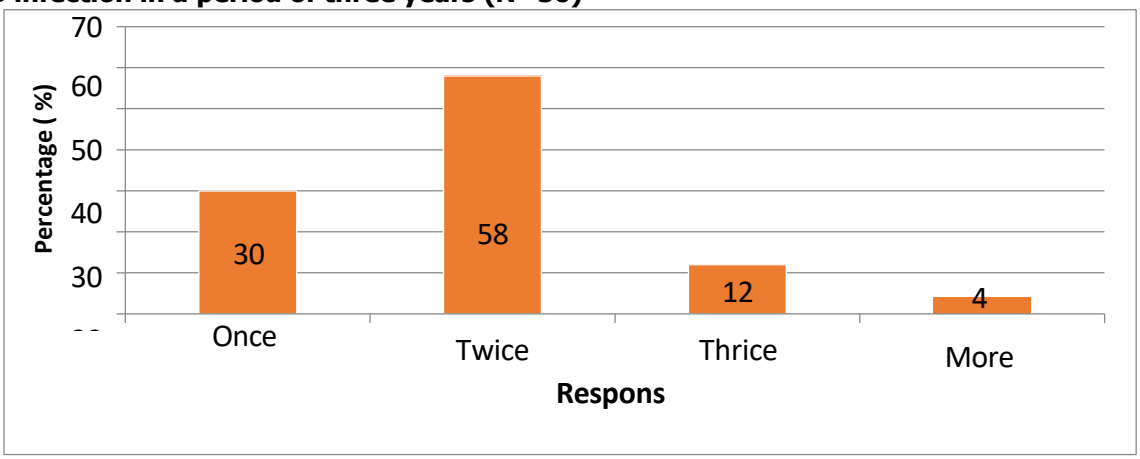
FACILITY RELATED FACTORS CONTRIBUTING TO THE PREVALENCE OF TB CO-INFECTION AMONG HIV PATIENTS

Figure 1 shows the distribution of respondents according to whether they had ever missed an ART appointment in the past three months. (N=50)



From the figure, more than half of the respondents (60%) had ever missed ART appointment in the past three months whereas the least (40%) had never missed ART appointment in the past three months.

Figure 2 shows the distribution of respondents according to how often have they tested for TB infection in a period of three years (N=50)



From the table, majority of the respondents (58%) they had tested for TB infection twice in a period of three years whereas the minority (4%) they had tested for TB several times.

Table 2 shows the distribution of respondents according to what they did after onset TB symptoms (N=50)

Response	Frequency(f)	Percentage (%)
Self-medicate	32	64
Seek medical aid	08	16
Used herbal medicine	09	18
Nothing	01	2
Total	**50**	**100**

N=50, Primary data (2024)

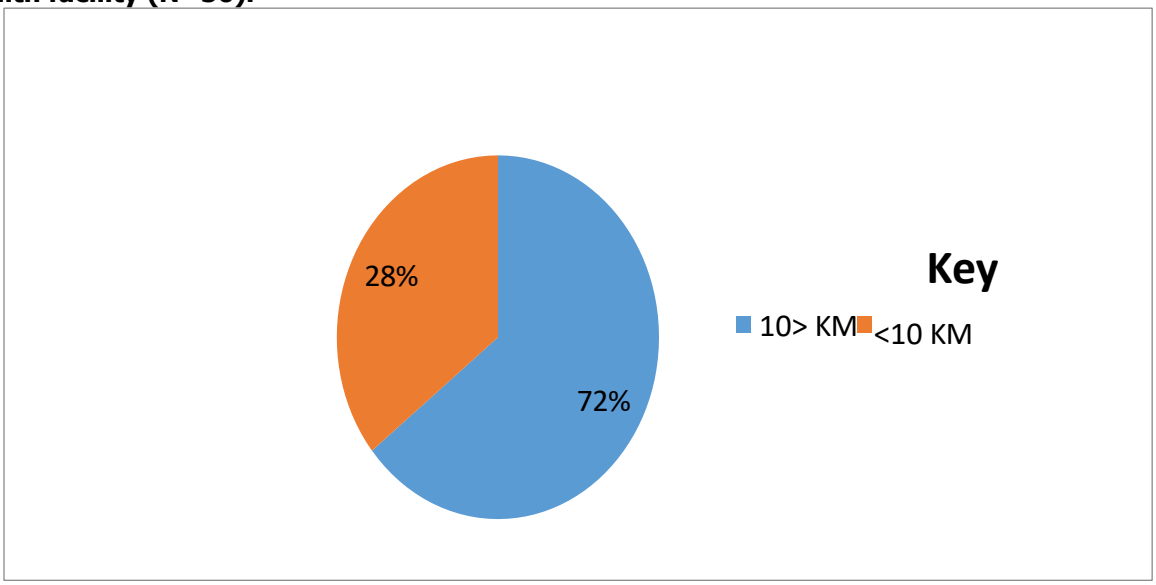
According to table 2, the majority of the respondents (64%) reported that after onset symptoms of TB they self- medicated whereas the minority (2%) did nothing after onset symptoms of TB infections.

Table 3 shows the distribution of respondents according to when they last had intensive counseling services from health workers in regards TB infection. (N=50)

Response	Frequency(f)	Percentage (%)
I have never	03	06
Two months back	08	16
Long time	25	50
Just of recent	14	28
Total	**50**	**100**

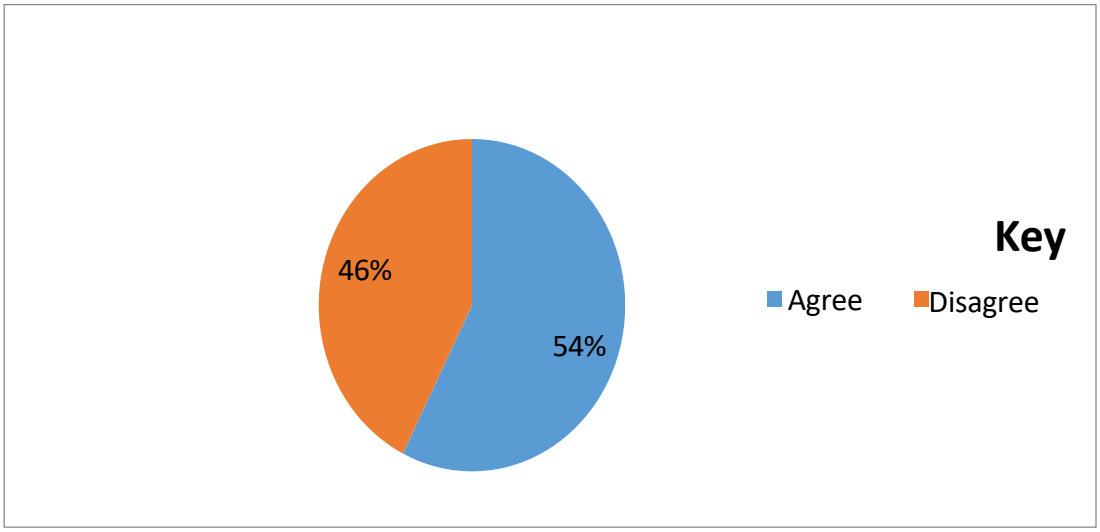
According to table 3, half of the respondents (50%) reported that last received intensive counselling services from health workers in regards to TB infection long time back whereas the least (6%) reported that they had never received intensive counselling services from health workers in regards to TB infection.

Figure 3 shows the distribution of respondents according to the distance from their homes to the health facility (N=50).



From figure 3, majority of the respondents (72%) reported > 10 KM as the distance from their homes to the health facility whereas the least (28%) reported <10 KM as the distance from their homes to the health facility

Figure 4 shows the distribution of respondents according to whether they get enough access to medicines at this facility (N=50).



From figure 4, most of the respondents (54%) reported that they get enough access to medicines at this facility whereas the least (44%) disagreed.

Discussion

Health facility contributing to the prevalence of TB co-infection among HIV patients.

The study results revealed that more than half of the respondents (60%) had ever missed an ART appointment in the past three months. Therefore, this truly confirms that most of the study participants had poor health-seeking behaviors. Therefore, increasing their chances of getting infected since they missed out on chances of receiving isoniazid preventive therapy. The study results were in line with Osei et al. (2023), where three-quarters (75%) of the participants with TB–HIV co-infection defaulted seeking ART.

However, the majority of the respondents (58%) had tested for TB infection twice in a period of one year. This could be attributed to the fact that participants were not seeking timely medication hence increasing the chances of being predisposing

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Original Article

themselves to multi-drug resistance. This was in disagreement with findings from North-East Ethiopia done by Ausman et al. (2018), where results showed that out of the participants who developed TB, (34.5%) had previously tested for TB once. Interestingly, half of the respondents (50%) reported that they last received intensive counseling services from health workers regarding TB infection a long time back. This signifies that participants were not equitably sensitized since most of them had poor health-seeking behaviors which could have been a predisposing factor to TB co-morbidly. This was in contrast with Setognal et al. (2023), where results showed that all the patients treated for TB had received adequate HIV counseling and testing (HCT). The study exposed that the majority of the respondents (72%) reported > 10 KM as the distance from their homes to the health facility. Therefore, such long distances had a significant relationship towards timely access to healthcare services since most of them were peasant farmers who could not afford transportation fees. Hence making them to be reluctant to seek preventive therapy for TB infection. This was consistent with Neha et al. (2022), where participants who had poor health-seeking behaviors (60%) complained about long distances to the facility.

Conclusion

Health facility-related factors contributing to the prevalence of TB co-infection among HIV/AIDS patients were poor health-seeking behaviors as (60%) had never missed an ART appointment in the past three months, multi-drug resistance as (58%) had tested for TB infection twice in a period of one year, self - medication as (64%) reported that after onset symptoms of TB they self- medicated and long distances to the facility as (72%) reported > 10 KM as the distance from their homes to the health facility.

Generally, the researcher concluded that low current cell count level, poor diet intake, substance use, poor medication behaviors, history of co-morbidity conditions apart from HIV, family size as opening up windows at home, inadequate family support in regards to timely medication, poor health-seeking behaviors, multi-drug resistance, self - medication and long distances to the facility were the main factors the prevalence of TB co-infection among HIV/AIDS patients.

Recommendation

To contribute to reaching the goal set in the global Sustainable Development Goal 3 which is to promote healthy lives and well-being for all by 2030, there is a need for serious investments into

combating TB–HIV co-infections in the municipality and even beyond. Therefore, the Ministry of Health should develop more strategies or intensify public education messages on TB–HIV co-infections and encourage voluntary testing.

Soroti Regional Referral Hospital administration should intensively continue to emphasize HIV/AIDS patients to seek timely diagnosis and treatment to reduce the reduction of co-infection and drug resistance during ART services.

Soroti Regional Referral Hospital administration should continue to carry out community outreach in different areas to enable HIV patients to receive sensitization on timely medical services, self-medication, and implications of substance use.

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List of Abbreviations

AIDS: Acquired Immune Deficiency Syndrome
ART: Anti-Retroviral Therapy
ATT: Anti-TB Therapy
BMI: Body Mass Index
CDC: Centre for Disease Control
CD4: Cluster of Differentiation 4
HAART: Highly Active Anti-Retroviral Therapy
HIV: Human Immunodeficiency Virus
HMIS: Health Management Information System
IPT: Isoniazid Preventive Therapy
KSHS: Kampala School of Health Sciences
MDR: Multi-Drug Resistance
MoH: Ministry of Health
MRDR: Modified Relative Dose Response
NGO: Non-Government Organization
NTL: National Tuberculosis Laboratory
TDF: Tenofovir Disproxil Fumarate
RR-TB: Rifampicin Resistant Tuberculosis
UNAIDS: United Nations Program for HIV/AIDS
USAID: United States Agency for International Development
WHO: World Health Organization

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Conflict of interest

The author declares no conflict of interest.

Author contributions

Mercy Akello was the principal investigator for this research study.
Sharifah Nabukenya supervised the research study.

Data availability
Data is available upon request.

Author Biography
Mercy Akello is a diploma student of pharmacy at Kampala School of Health Sciences.
Sharifah Nabukenya is a Tutor at Kampala School of Health Sciences.

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Contact: +256 702 986 663
Email: info@phafrica.org/worldhealthresearch2024@gmail.com
Website: https://whr.phafrica.org
Address: Scholar's Summit Nakigalala, P. O. Box 166256, Entebbe Uganda, East Africa