

Knowledge, attitude, and practices towards prevention of Tuberculosis among HIV-positive patients at Kibagabaga District Hospital, Rwanda, 2021

Emile Sebera^{1,2,*}, Frank Kiiza^{1,3}, Janvier Irankunda¹, Consilie Mukarwego¹, Emile Twagirumukiza^{1,2}, Valens Bubanje^{1,2}

¹University of Rwanda, Bachelor of Clinical Medicine and Community Health, Kigali City, Rwanda

²Mount Kenya University, Master's of Public Health/Epidemiology and Disease Control Option, Kigali City, Rwanda.

³Akademia Nauk Stosowanych Wyższa Szkoła Zarządzania i Administracji w Opolu, Master's in Management, Poland

ABSTRACT

INTRODUCTION: Globally, an estimated 10.3 million people fell ill with TB in 2021, especially for people living with HIV. This study was conducted to assess the knowledge, attitudes, and practices (KAP) of TB prevention among HIV patients at Kibagabaga District Hospital (KDH). This study on TB prevention knowledge, attitudes, and practices among HIV-positive patients at Kibagabaga District Hospital aims to improve public health practices and the lives of people living with HIV by identifying knowledge gaps, tailoring prevention strategies, encouraging early TB detection, and informing policy development

METHODS: An analytical cross-sectional study was conducted at Kibagabaga District Hospital (KDH) from November 2019 to February 2021. A sample size of 237 Participants was calculated using Epi-info software and selected through a stratified simple random sampling method. Data collection employed self-administered questionnaires, and analysis was performed using SPSS software version 23.

RESULTS: Among the 237 Participants, the demographics revealed a majority of females (60.3%), with nearly half (45.1%) being married. The private sector employed over half (52.5%) of the Participants. Primary education was the most common educational attainment (51.1%), and the 39-48 age group represented the largest portion (35.4%). Encouragingly, a significant majority demonstrated positive knowledge (86.9%), attitude (86.1%), and practices (91.6%) towards tuberculosis prevention.

CONCLUSION: While the study revealed positive overall knowledge, practices, and attitudes towards tuberculosis prevention among Participants, a potential knowledge gap regarding the specific cause of the disease was identified. This suggests that future health education efforts for HIV patients could benefit from further emphasis on understanding the causative agent of tuberculosis for even more comprehensive knowledge and ongoing positive behaviour towards prevention.

*Corresponding author:

Emile Sebera
University of Rwanda, Kigali, Rwanda
Email: emilesebera12@gmail.com

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INTRODUCTION

Tuberculosis (TB) is a disease of major public health concern and the leading cause of death in people living with HIV/AIDS [1]. It is the most opportunistic infection among HIV-infected persons [1,2]. People living with HIV are 20 times more likely to develop active tuberculosis disease than people without HIV [3]. TB is the most common cause of HIV/AIDS-related death (4). TB/HIV co-infection is a significant global public health problem. In 2014, 1.2 million new cases of TB/HIV co-infection were estimated worldwide, and more prevalent in Africa [4]. In 2018, an estimated 10 million people fell ill with tuberculosis. Among them, 5.7 million were men, 3.2 million were women, and 1.1 million were children [5]. However, TB is curable and preventable. Rwanda faces a significant public health challenge with tuberculosis, particularly in Kigali city, due to its proximity to high-burden countries like DRC Congo, Tanzania, and Kenya [3]. According to the WHO 2018 report, Rwanda's TB incidence of 59/100,000 and TB/HIV co-infection rate of 12/100,000 exceed the global target of less than 10 cases/100,000 by 2035, highlighting the need for continued efforts [9].

An estimated 58 million lives were saved through TB diagnosis and treatment between 2000 and 2018 [4]. In 2005, Rwanda initiated a program for community diagnosis of TB. Community health workers played a crucial role by raising awareness about TB identification and encouraging people with coughs and their household contacts to seek diagnosis and treatment at health centres [9]. According to the DHS in 2012, 75% of participants did not seek care when experiencing symptoms suggestive of tuberculosis (TB). Inadequate knowledge about TB for people living with HIV results in increased transmission of TB and delay in health-seeking behaviour.

Studies showed that good knowledge about TB (definition of TB, causes, signs and symptoms, treatment and methods of prevention) influences positive behaviour by preventing a delay in health-seeking behaviour [3]. Negative attitudes such as feeling that HIV patients should not be concerned about TB were positively associated with TB transmission. Regarding practices, good practices in TB prevention such as covering the nose when

coughing or sneezing, going to the health facility when he/she experiences TB-related symptoms, and being screened for TB help in the reduction of the transmission of TB infection [11].

Furthermore, certain behaviours, such as not undergoing TB testing, seeking treatment for general health conditions from traditional healers instead of healthcare facilities, and failing to complete preventive isoniazid therapy (IPT) among HIV-positive individuals, have been linked to increased TB transmission and the development of multidrug-resistant tuberculosis (MDR-TB) [11]. This study aims to assess knowledge, attitudes, and practices (KAP) regarding tuberculosis (TB) prevention and control among HIV-positive patients at Kibagabaga District Hospital in Rwanda. By addressing identified knowledge gaps and analyzing KAP, the study seeks to inform targeted interventions and educational programs to improve TB prevention and control measures for this vulnerable population, ultimately contributing to reducing the TB burden and enhancing public health outcomes in Rwanda.

METHODS

Study design: This study employed a cross-sectional quantitative design to assess knowledge, attitudes, and practices (KAP) regarding TB prevention and control among HIV-positive patients in Rwanda. Data was collected from 237 participants aged 18 and above attending the Antiretroviral Therapy (ARV) department at (KDH).

To ensure participant privacy, this study implemented the following measures: all data collection instruments were anonymized, meaning no names or other personally identifiable information (PII) were linked to the data. Data was stored securely on a password-protected server accessible only to authorized personnel. All research staff involved in the study signed confidentiality agreements.

Participants: Before participation, all individuals provided written informed consent in a language they understood. The consent form explained the study's purpose, procedures, potential risks and benefits, and participants' right to withdraw from the study at any time. The research protocol and informed consent process were reviewed and

approved by the University of Rwanda Research Board which ensured research adhered to ethical principles.

Sampling Technique: To ensure participant representation, stratified random sampling was employed. This technique involved dividing the study population into subgroups based on relevant characteristics and then randomly selecting Participants from each subgroup.

Daily attendees in the ARV department were first divided into two groups by sex (male and female). Within each sex group, Participants were further categorized into three age groups: 18-40 years, 41-62 years, and above 62 years. This ensures representation across different age demographics. Using a random sampling technique, eight Participants were selected daily, maintaining a balance of three males and five females. This approach aimed to achieve a sample size sufficient for robust statistical analysis.

Sample size: The sample size of 237 was determined using Epi-info software, considering the total study population, a 95% confidence interval, and a 0.005 margin of error.

Data collection: A structured, self-administered questionnaire was the primary tool for data collection. This questionnaire, consisting of four sections, was developed based on a modified and validated version of the World Health Organization (WHO) tool titled "A guide to developing knowledge, attitude and practice surveys" (World Health Organization, 2018) [16]. This ensured the questionnaire's reliability and relevance to the study objectives.

The four sections of the questionnaire addressed: Sociodemographic characteristics: This section gathered information about Participants' age, sex, marital status, education level, and employment status. Knowledge: This section assessed Participants' understanding of TB transmission, symptoms, diagnosis, and prevention measures. Attitude: This section evaluated Participants' beliefs and perceptions towards TB and its management. Practices: This section explored Participants' behaviours related to TB prevention, such as seeking healthcare for symptoms or completing preventive treatments.

Data analysis: Data collected through the

questionnaire was analyzed using the Statistical Package for the Social Sciences (SPSS) software version 23. Descriptive statistics, including frequencies and percentages, were used to summarize the findings. Results were presented in tables for clarity.

Scoring knowledge, attitude, and practices: Participants scoring above 50% on each section were categorized as having "good" knowledge, attitude, or practices, respectively. While this threshold is a common practice in KAP studies, it's important to acknowledge that other studies may use different cut-off points. Future research could explore the justification and potential implications of these varying thresholds.

RESULTS

Social-demographic characteristics of the participants (N=237)

The social demographic characteristics of the participants are presented in Table 1 below.

The study showed that the majority of participants were between 39 and 48 years old, with females slightly outnumbering males. Most participants were married and had a primary school education. Private work was the most common occupation, and most participants lived in urban areas. The majority had been receiving HIV treatment for 11-20 years.

Knowledge of participants about TB

The knowledge of all participants (237) was assessed by asking questions on the cause, transmission, signs and symptoms of TB, risk factors, and treatments of TB. Table 2 below shows the distribution of individual responses on the knowledge of participants about TB.

This study revealed positive knowledge among HIV patients regarding TB. While over 92% had heard about the disease and understood its airborne transmission, a significant gap existed in accurately identifying the bacterial cause, with many mistakenly attributing it solely to smoking. Additionally, most participants recognized common TB symptoms, risk factors for HIV-positive individuals, treatment options, and typical treatment durations.

Table 1: Sociodemographic Characteristics of HIV-Positive Study Participants at KDH, Rwanda

Socio-demographics		Frequency	Percentage
Gender of participant	Male	94	39.7
	Female	143	60.3
Marital status of a participant	Single	35	14.8
	Married	107	45.1
	Divorced/separated	51	21.5
	Widow/widower	44	18.6
	Public worker/government employee	13	5.5
Occupation of the participant	Private worker/work for others	125	52.7
	Domestic worker/self-employed	99	41.8
	Primary	121	51.1
Education level of the participant	Secondary	76	32.1
	University	15	6.3
	No formal education	25	10.5
	Ubudehe category of participant	Category 1	46
Category 2		102	43
Category 3		82	34.6
Category 4		6	2.5
Unknown		1	0.4
Residential area of the participant	Rural: Living in a small community with a low population density, typically outside of major towns or cities.	37	15.6
	Urban: Living in a densely populated area, typically characterized by a high concentration of buildings and infrastructure, often associated with cities and towns	158	66.7
	semi-urban	42	17.7
Age group of Participants	18-28 years	29	12.2
	29-38 years	59	24.9
	39-48 years	84	35.4
	49-58 years	53	22.4
	59-68 years	7	3
	69-78 years	5	2.1
Duration with HIV	1-10 years	103	43.5
	11-20 years	113	47.7
	21-30 years	18	7.6
	31-40 years	3	1.3

Table 2: Knowledge of TB Among HIV-Positive Study Participants at KDH, Rwanda

Knowledge		Frequency (n)	Percentage
Ever heard of an illness called TB	No.	17	7.2
	Yes.	220	92.8
Cause of Tuberculosis.	Bacteria.	65	27.4
	Witchcraft.	4	1.7
	Smoking.	122	51.5
	I do know.	46	19.4
Transmission of TB	Sharing hygienic materials with Tuberculosis (TB) patients.	90	38.0
	Air when a person infected with TB coughs or sneezes.	122	51.5
	I do know.	25	10.5
Signs of TB	Cough for more than 2 weeks, weight loss, persistent fever, and night sweats.	208	87.8
	Nose bleeding.	18	7.6
	Excessive urination.	4	1.7
	I do know.	7	3.0
	Risk of developing TB disease	People who were vaccinated for TB.	29
Treatments of TB	HIV patients.	197	83.1
	Sports person.	6	2.5
	I do know.	5	2.1
	TB is curable by using herbal medicine.	5	2.1
	TB is curable by using medicine under the directly observed short-course treatment (DOTS).	208	87.8
Treatment duration of TB	TB is curable by resting at home without medicines.	1	0.4
	TB IS not curable.	23	9.7
	2 months.	10	4.2
	6 months or 9 months depending on its type.	186	78.5
	I don't know.	41	17.3

Attitude of participants toward TB

The attitude of the participants toward TB was assessed by asking questions about TB prevention as shown in the table below.

Table 3 shows the attitude responses of the

participants toward TB. The majority of the participants, 94.1% believed that HIV-infected persons should be concerned about TB. The findings of our study show that 83.1% of the participants believe that TB is a serious disease. In addition, the majority of the participants,

Table 3: Distribution of Responses to Individual Items Regarding Attitudes Towards Tuberculosis (TB)

Attitude		Frequency	Percentage
HIV infected people should be concerned about TB.	No	6	2.5
	Yes	231	97.5
	I don't know	8	3.4
TB is a serious disease.	No	39	16.5
	Yes	197	83.1
	I don't know	1	0.4
Being sad and hopeless if told to have TB.	No	163	68.8
	Yes	71	30
	I don't know	3	1.3
A person with TB should be rejected by the community.	No	144	60.8
	Yes	89	37.6
	I don't know	4	1.7
Feeling of keeping family member's TB secret.	No	103	43.5
	Yes	132	55.7
	I don't know	2	0.8

68.8%, believe that they should not be sad and hopeless if they are told to have TB. The majority of Participants, 60.8%, believe that a person who has TB disease should not be rejected by the community. The survey results suggest that a significant portion of participants (55.7%) might be hesitant to disclose a family member's TB due to potential stigma, highlighting the need for interventions to address stigma and promote open communication about TB.

Practices of participants toward tuberculosis prevention

The practices of all participants (237) were assessed by asking questions about TB prevention and Table 4 shows the responses.

As shown in Table 5, the findings show that 13.1% of participants had poor knowledge of TB prevention and 86% had positive attitudes regarding TB. Results show that 8.4% had poor preventive practices toward TB.

DISCUSSION

Knowledge: This study found that the majority of participants (86.9%) demonstrated good knowledge about TB. While comparable to studies in similar settings [3], a knowledge gap

regarding the specific cause of TB was identified, with a significant portion incorrectly associating it solely with smoking. This highlights the need for healthcare providers to emphasize transmission routes and causative agents (*Mycobacterium tuberculosis*) during TB prevention education for HIV patients.

The study revealed a generally positive attitude toward TB among participants (86.1%), comparable to previous research in Rwanda [3]. This improvement is likely attributed to ongoing community-level interventions delivered by peer educators and healthcare workers. However, a minority of participants (16.5%) expressed a need for further education on the seriousness of TB prevention. Additionally, while most participants (68.8%) understood that TB is not a cause for hopelessness, a concerning number (30%) expressed potential negative emotional responses to a TB diagnosis. Addressing these concerns through counselling and emphasizing the curability of TB is crucial.

The study found that the majority of participants (91.6%) reported good TB preventive practices, exceeding findings from previous studies in Rwanda [3]. This improvement potentially stems from heightened awareness of respiratory hygiene practices due to the COVID-19 pandemic. However, several areas require further focus:

Table 4: Self-Reported Practices of Tuberculosis (TB) Prevention Among HIV-Positive Study Participants

Practice	Responses	Frequency	Percentage
Covering his/her nose and mouth when sneezing or coughing.	No	18	7.6
	Yes	217	91.6
	I don't know	2	0.8
Going to the traditional healer if he/she was sick to treat a general health problem.	No	208	87.8
	Yes	27	11.4
	I don't know	2	0.8
Going to a health facility when he/she realizes his /her symptoms are related to Tuberculosis (TB)	No	12	5.1
	Yes	224	94.5
	I don't know	1	0.4
Necessary to finish TB treatment if TB patients feel better after 2 months of treatment	No	102	43.0
	Yes	128	54.0
	I don't know	7	3.0
Ever been tested for Tuberculosis or screened for TB before	No	115	48.5
	Yes	120	50.6
	I don't know	2	0.8
TB patients spitting everywhere will spread the disease?	No	26	11.0
	Yes	203	85.7
	I don't know	8	3.4

Traditional healer reliance: While most participants (87.7%) preferred seeking medical help from professionals, a concerning number (11.4%) reported visiting traditional healers. Educational interventions can address this by emphasizing the importance of proper TB diagnosis and treatment through the healthcare system.

While over half of participants (54%) acknowledged the importance of completing TB

treatment despite feeling better, almost half (43%) displayed poor adherence practices. Educational efforts should emphasize the significance of completing the full treatment regimen to prevent drug resistance.

Although half of the participants (50.6%) recognized the importance of TB screening, nearly half (48.5%) had never been screened. Integrating routine TB screening into HIV care and promoting

Table 4: Overall distribution of Responses to Individual Items Regarding KAP scores categories Towards Tuberculosis (TB) Among HIV-Positive Study Participants

Score		Frequency	Percentage
Knowledge score	Good knowledge	206	86.9
	Poor knowledge	31	13.1
Attitude score	Positive attitude	204	86.1
	Negative attitude	33	13.9
Practice score	Good practices	217	91.6
	Poor practices	20	8.4

its benefits is essential. The majority (85.7%) understood the risks associated with improper spitting by TB patients, but almost 11% lacked this knowledge. Continued education is crucial to promote safe practices and prevent transmission. This cross-sectional study design limits causal inferences. Additionally, self-reported data may be susceptible to recall bias. Future research could explore longitudinal designs and utilize objective measures to address these limitations.

CONCLUSION

The study found that over half of the respondents demonstrated good knowledge, positive attitudes, and good practices towards TB prevention. However, a knowledge gap regarding the specific

cause of TB was identified, with a majority incorrectly associating it with smoking alone. This highlights the need for healthcare providers to strengthen educational efforts for HIV patients about TB prevention, with an emphasis on its transmission routes and causative agent (*Mycobacterium tuberculosis*).

Beyond the general findings, further research is crucial to explore the factors associated with good KAP (Knowledge, Attitude, and Practices) towards TB prevention among HIV patients. These factors may include age, marital status, duration of HIV infection, smoking history, and education level. Identifying such associations can inform targeted interventions tailored to specific patient groups, ultimately enhancing KAP and improving overall TB prevention strategies.

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