PREVALENCE AND RISK FACTORS OF TUBERCULOSIS AMONG PATIENTS ATTENDING ARUA REGIONAL REFERRAL HOSPITAL, ARUA DISTRICT. A CROSS-SECTIONAL STUDY.

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ABSTRACT
Purpose of the study
It was for the prevalence and risk factors of tuberculosis among patients attending to Arua Regional Referral Hospital, Arua district.

The specific objectives
To establish the prevalence of Tuberculosis among patients seen at Arua Regional Referral Hospital, individual risk factors of tuberculosis infection among patients attending Arua Regional Referral Hospital, and health facility-related factors for tuberculosis among patients attending Arua Regional Referral Hospital, Arua District.

Methodology
A cross-sectional study design was carried out on a sample size of 50 respondents with a simple random technique. Data was collected using semi-structured questionnaires with closed and open-ended questions; data was later analyzed using tally sheets, computed into frequency and percentages using the Microsoft Excel computer program with illustrated figures (bar and pie charts) and tables for easier interpretation.

Results
The overall results revealed that 68% had no active tuberculosis, and 76% had suffered from pulmonary tuberculosis.
In addition to that, the general results from individual risk factors associated with pulmonary tuberculosis revealed that 40% said yes to alcohol being the major risk factor of tuberculosis, majority 48% said yes to having HIV/AIDS patients are at risk of acquiring tuberculosis. However, for health facilities related to risk factors of Tuberculosis, 96% have never heard about tuberculosis. Majority 42% from radio sources, and the majority 52% preferred avoiding smoking to prevent the acquisition of tuberculosis.

Conclusion
Even though the prevalence and risk factors of tuberculosis among patients attending Arua Regional Referral Hospital, were fairly satisfactory, poor prevention methods could impose a significant impact on the development of tuberculosis.

Recommendations
It encourages proper sensitization and awareness of the community or the entire public, about TB, its effects & prevention strategies. Counseling services should be offered in health units and churches or mosques to help those affected families.

INTRODUCTION
According to World Health Organization (2022), data from the most recent national TB patients cost survey, 1 in 2 TB-affected households worldwide have expenses that exceed 20% of their household income. Individuals with weakened immune systems, including those with HIV, diabetes, malnutrition, or tobacco use, are more susceptible to illness (Muttamba et al., 2020) Worldwide in 2021, there were 2.2 million new cases of tuberculosis (TB) linked to malnutrition, 740,000 cases linked to alcohol use disorders, and 690,000 cases linked to smoking. (WHO, 2022).

Tuberculosis (TB) is a disease that can be cured, but it is still a significant worldwide health issue. Among those living with HIV, tuberculosis (TB) is the primary preventable cause of mortality and the second most common infectious disease worldwide (Grebreweld et al, 2018). An estimated

10.4 million new cases and 1.4 million fatalities from tuberculosis were reported in 2015; an additional 0.4 million deaths among HIV-positive individuals were attributed to tuberculosis (WHO, 2016). In the same year, the TB case fatality rate varied widely from under 5% in some countries to more than 20% in most countries in the WHO African Region (Mekonnen et al, 2015).

Compared to people without HIV, those living with HIV have a 20-fold increased chance of developing tuberculosis (TB), and this risk rises as the count of critical immune cells (CD4) gradually declines (Aturinde et al, 2019). HIV/TB co-infection is thus known as a „double trouble" and a public health threat especially for regions where both diseases are endemic (Davy-Mendez et al, 2019).

According to a study by Muttamba et al. (2019) on the Prevalence of Tuberculosis Risk Factors among Bacteriologically Negative and Bacteriologically Confirmed Tuberculosis Patients from Five Regional Referral Hospitals in Uganda; 978 (or 55%) of the 1,862 participants were men, and their median age (interquartile range: 27–48) was 36. Three TB tests yielded positive results in as many as 273 cases (15%). Among patients with TB who tested positive and negative for bacteria, the most common risk factors were smoking cigarettes (9.3%), smoking (24%), contact (4.2%), male gender (51.4%), alcohol usage (17.2%), diabetes (0.7%), and family history of tuberculosis (12.1%). (Muttamba et al, 2019).

The study aims to establish the prevalence and risk factors of Tuberculosis among patients attending to Arua Regional Referral Hospital, Arua district.

METHODOLOGY
Study design.
A retrospective cross-sectional study design was employed using quantitative data. Based on laboratory, general ward, and ART clinic records of Arua Regional Referral Hospital from 31st June 2022 to 1st July 2023.

Study area.
Arua Referral Hospital is located in Arua, Northern Uganda approximately 430.4km from Kampala the capital city of Uganda. The hospital receives referrals from nearby districts such as Adjumani, Koboko, Maracha, Moyo, Nebbi, Yumbe, Zombo, Madi Okolo, Obongi, Terego, Pakwach with an average of 300 patients per day. The hospital has different departments namely; OPD, Inpatient, Therapeutic Feeding Centre, Pediatric ward, ART clinic, TB ward, ICT department, Dental, Pharmacy, Laboratory, surgical, and Antenatal. The rationale for choosing the study area was that it was observed that a lot of patients were Tuberculosis cases.

The study took a period of eleven months ranging from January to November 2023.

Where data collection started in July to August 2023, the collected data from August to September 2023, and then the report was compiled from September to October and submitted in November.

Study population.
The study included all patients who attended medical services at Arua Regional Referral Hospital, Arua district.

Sample size determination.
The sample size was determined using Wong & Burton's formula (1965)

Sample size (n) = QR/O

Where,

Q- Total number of days taken for data collection

R- Maximum number of respondents who were interviewed per day O- Maximum time taken on each respondent per day.

Values: Q= 10 days R=5 respondents.

O=1 hour (Time duration was from 8 am- 1 pm each day)

Therefore, n= QR/O

N= (10x5)/1

=50 Respondents

Therefore, 50 respondents were considered for the study.

Sampling technique.
A simple random method was used to select the respondents from the source population. The technique was preferred because it ensured freedom from human bias and each member of the target population had an equal and independent chance of being included.

Sampling procedure.
The study participants were selected by simple random sampling from the TB clinic until a specified sample size was obtained from the hospital. In the simple random method, each member of the population with pulmonary TB who presented during the session was assigned a unique number, the numbers were then written on similar pieces of paper which were folded, then placed in the bowl, and thoroughly mixed. A blindfolded researcher picked one at a time without replacement until he/she got the required number of subjects in the sample.

Data collection method
The data was collected using a questionnaire and review of records with the help of guidance of the record keeper in Arua Regional Referral Hospital. The data were obtained by counting tallies on paper using pen and paper and ruler. Other information regarding the study topic was obtained through the internet and other published bodies related to the topic.

Data collection tools.

A well-organized self-administered questionnaire with both open and closed questions prepared in the English language was used to collect data from the respondents with the aid of a research assistant which helped in obtaining the data required from the respondents, especially the illiterate ones.

Data collection procedure.

A letter of introduction from the principal of Kampala School of Health Sciences was taken and delivered to the District Health Officer (DHO) and then another copy to the medical superintendent who in turn introduced the research team to the in-charge of TB clinic and the respondents at large. Consent forms were delivered to the respondents to ask them for help to participate in the study. Questionnaires were distributed to each respondent and the ways of answering the questionnaires were explained to each respondent. About a day or two were given to each respondent to answer the questions and return the questionnaires for data analysis.

Study Variables.
Dependent variable.

The dependent variable in the study was the prevalence of Tuberculosis among patients.

Independent Variable.

The independent variable in the study was the risk factors contributing to cases of Tuberculosis.

Quality control.
Training of research assistant.

An assistant was trained in conducting the study in Arabic language, Madi language, Lugbara language, Alur language, and English as well.

Pretesting of Questionnaire.

The questionnaire was pretested at Palorinya Health Center III a week before going to Arua Regional Referral Hospital for collection of data between June and July 2023 which helped to determine the validity, feasibility, and reliability of the questionnaires.

Data analysis and Presentation.

Each day of data collection was organized and kept in the file until all that was required was obtained. Then processed and analyzed using Microsoft Excel and Microsoft Word. Further interpretations of the data were done, to elaborate more on all possibilities as per the results. It was done following the specific objectives of the study and presented in the form of pie charts, tables, bar graphs, and percentages (%).

Ethical considerations.

An introductory letter was obtained to collect and obtain data from KSHS through the office of the academic registrar. It was presented to the administration of Arua Regional Referral Hospital who then showed the record department of the facility to obtain the necessary data. The data was availed and guided accordingly. All information gathered was kept confidential.

STUDY FINDINGS
Demographic characteristics.

Table 1.1: Demographic characteristics. (N=50)

RESPONSE	FREQUENCY (F)	PERCENTAGE (%)
Sex of respondents		
Male	35	70
Female	15	30
Total	**50**	**100**
Age of respondents		
18-25	01	2
26-32	03	6
33-39	07	14
40 above	39	78
Total	**50**	**100**
Religion of the respondents		
Catholic	17	34
Muslim	07	14
Protestants	10	20
Others	16	32
Total	**50**	**100**
Education level		
Never went to school	26	52
Primary	15	30
Secondary	07	14
Tertiary/university	02	04
Total	50	100

Table 1.1 shows the majority of respondents (70%) were male while the minority (30%) werefemale. Many of the while the least (14%) were Protestant. Moreover, (52%) never went to school while the least (4%) attained

| Marital status of respondents		
Single	16	32
Married	12	24
Divorced	00	00
Separated	22	44
Total	**50**	**100**
Occupation of respondents		
Employed	10	20
Self- employed	14	28
Unemployed	26	52
Total	**50**	**100**
Tribe of respondents		
Madi	08	16
Lugbara	10	20
Arabic	12	24
Others	20	40
Total	**50**	**100**

respondents (78%) were 40 years and above while the rest (2%) were in the range of 18-25 years. (34%) were Catholic tertiary/university level.

Table 1.2: Table 1: Demographic characteristics continuation. (N=50)

In Table 1.2, most of the respondents (44%) were separated while the least (24%) were married. Many (52%) were unemployed while the least (20%)were employed. In terms of their tribes (45%) were from a tribe other than Lugbara, Arabic, & Madi while the least (16%) wereMadi

Prevalence of pulmonary tuberculosis among patients attending Arua regionalreferral hospital.

Figure 1: Shows the distribution of respondents according to their pulmonary tuberculosisstatus. (N=50)
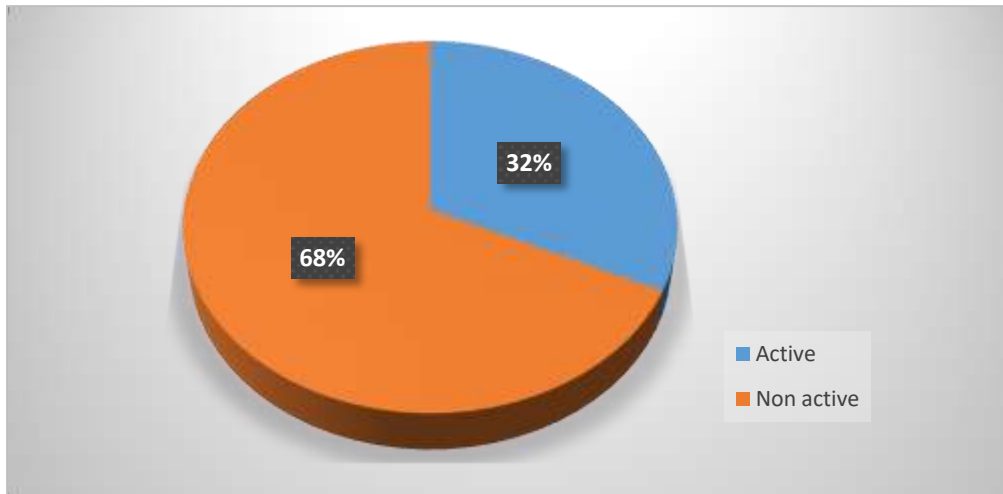
From Figure 1, t h e majority (68%) of respondents have no active pulmonary tuberculosiswhile the minority (32%) have active pulmonary tuberculosis.

Figure 2: S**hows the distribution of respondents according to whether they have ever suffered from pulmonary tuberculosis. (N=50)**
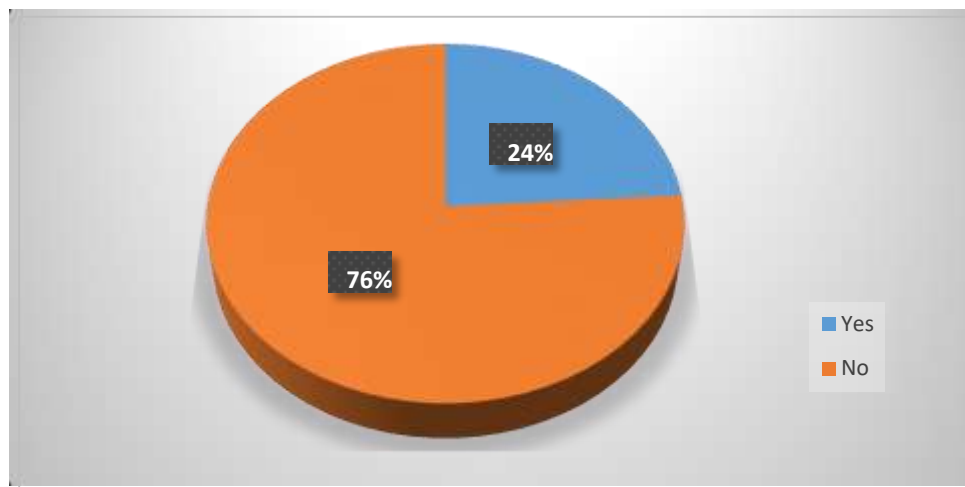

Figure 2 illustrates that the majority (76%) of the respondents had never suffered from p u l m o n a r y tuberculosis while the minority (24%) had suffered from pulmonary tuberculosis.

Individual factors for tuberculosis infection and disease.

Table 2: Shows the distribution of respondents according to the major risk factor of pulmonary tuberculosis.

Risk factor	Frequency (f)	Percentage (%)
Smoking	20	40
Old age	12	24
Alcohol	18	36
Total	50	100

Table 2 shows that most of the respondents (40%) said that smoking is the major risk factor fortuberculosis while the least (24%) of the respondents said old age.

Health facility-related risk factors for Tuberculosis.

Figure 3: Shows the distribution of respondents according to whether they have ever heardabout pulmonary tuberculosis.
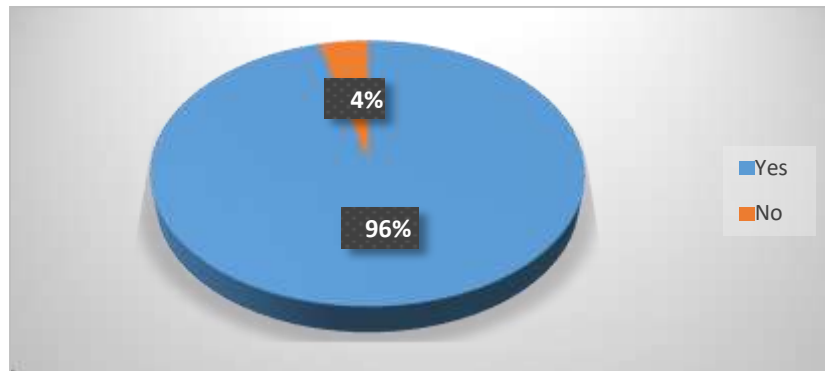

Figure 3 shows that the majority of the respondents (96%) have ever heard about tuberculosiswhile the least (4%) never heard about tuberculosis.

Figure 4: Shows the distribution of respondents according to whether having correct knowledge about tuberculosis would help to prevent it.
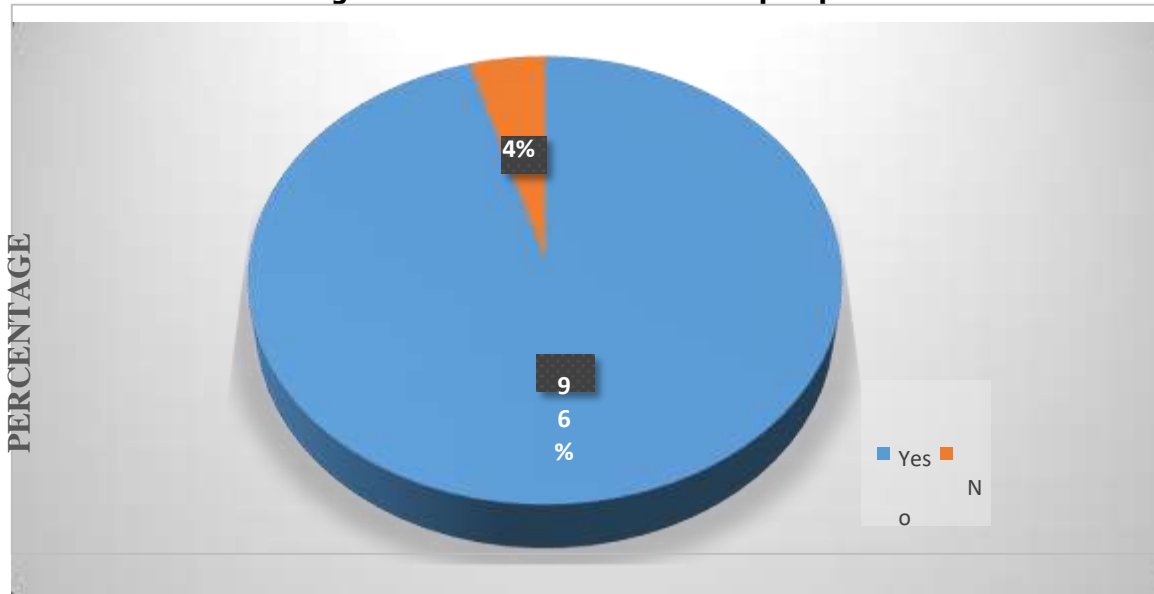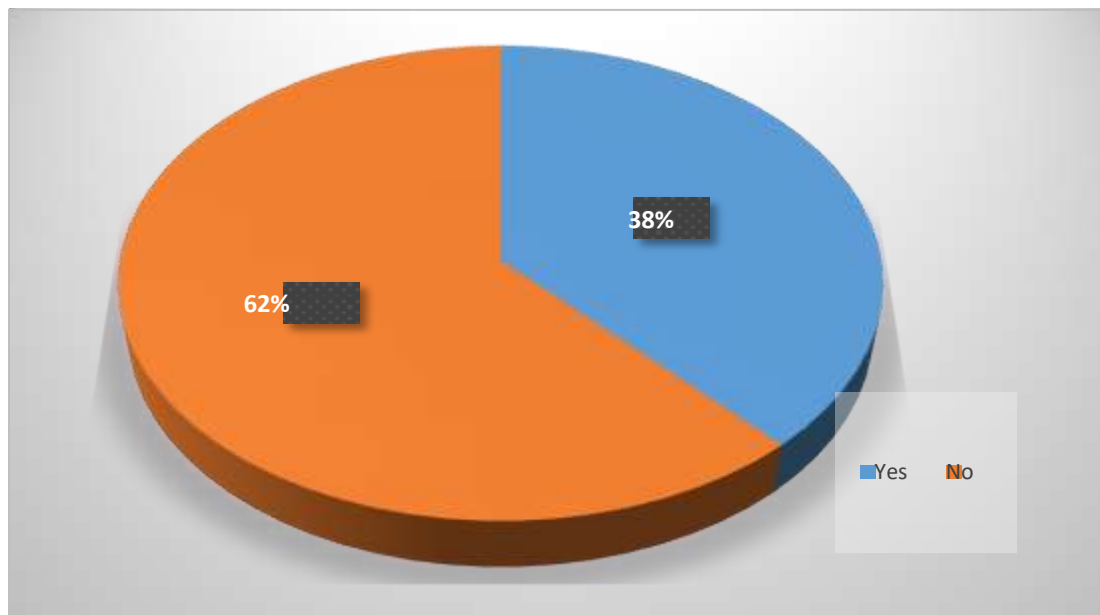

Figure 4 shows, the majority of the respondent (96%) said ' Yes' to having correct knowledgeabout tuberculosis would help to prevent it while the majority (4%) said 'No' to it.

Figure 5: Show the distribution of respondents according to whether they smoke.

From Figure 5, most (62%) of the respondents didn't smoke while the rest (38%) did smoke.

Table 3: Shows the distribution of respondents according to the method they preferred for the prevention of acquiring tuberculosis. (N=50)

Method preferred	Frequency	Percentage (%)
Avoid smoking	26	52
Avoid contact with TB patient	14	28
BCG vaccination	10	20
TOTAL	**50**	**100**

Table 3 shows most of the respondents (52%) preferred avoiding smoking to prevent acquisition of tuberculosis while the least (20%) preferred BCG vaccination.

DISCUSSION OF FINDINGS.
The prevalence of tuberculosis among general patients seen at Arua Regional Referral Hospital.
Findings obtained from a sample of 50 respondents that showed the majority (68%) of respondents had no active pulmonary tuberculosis. This was in line with the National TB prevalence survey conducted in 2015 puts the incidence of TB at 234 per 100,000 people of the population and the prevalence of TB is 253/per 100,000 population (WHO Africa,2016).

However, the finding that showed the majority (68%) of respondents had no active pulmonary tuberculosis was not in line with the study carried out. In 2017, the Uganda Ministry of Health was notified of increasing cases of multidrug-resistant tuberculosis in Arua and other West Nile districts like Moyo, and Adjumani by Medical Teams International, a non-governmental organization that operates in regions among refugees (Okethwangu et al., 2019). The report reveals increasing MDR-TB cases in West Nile including confirmed cases among refugees in settlements in Obongi, Arua, Adjumani, and Yumbe.

In regards to respondents who suffered from tuberculosis, the study showed that the majority (76%) of the sampled respondents didn't suffer from tuberculosis.

Individual risk factors associated with Tuberculosis infection among patients attending Arua Regional Referral Hospital, Arua District.
Findings of a study carried out of 50 respondents show that the majority (48%) of the respondents said yes to having HIV/AIDS would be at risk of tuberculosis and this was in line with a study done by Meda et al. (2013). Based on findings carried out by 50 respondents, the majority (40%) said alcohol is the major risk factor for tuberculosis.

However, this was in line with the study conducted by Kirenga et al. (2015), where Data showed that the following important recognized TB risk factors were prevalent: HIV infection (41.4%), alcohol usage (50.7%), poverty (39.5%), smoking (26.3%), family history of tuberculosis (17.5%), tuberculosis contacts (11.5%), and diabetes (5.4%).

Health facility-related factor of Tuberculosis at Arua Regional Referral Hospital.
The findings of a study carried out of 50 respondents show that the majority (96%) had ever heard about tuberculosis was in line with a study from CDC the recommended treatment of TB disease in adults infected with HIV (CDC, 2016).

CONCLUSIONS.
The study showed that the majority of the population is aware since 96% of the respondents had ever heard about tuberculosis, 42% of the respondents as the majority heard about tuberculosis from radio, and 76% had ever suffered from tuberculosis. In addition to that, the prevalence of tuberculosis among patients was pleasing in view that 68% of the respondents had no active tuberculosis, and 68% of respondents believed that having correct knowledge about tuberculosis would help to prevent it. However, it was noted that the study posed negative risk factors for tuberculosis since the majority 40% of the respondents said smoking was the major risk factor, 48% of respondents said yes to having HIV/AIDS are at risk of tuberculosis and the majority 62% of the respondent didn't smoke.

STUDY LIMITATIONS.
Challenges faced when conducting the study were financial constraints in feeding & transport refund of respondents.

RECOMMENDATION.
The government of Uganda through the Ministry of Health and other partner/organizations fighting against tuberculosis should increase their efforts in sensitization, enforcement, and prevention of the community from tuberculosis through

radio talks shows, television news, community sensitization programs, and awareness to prevent the infection of tuberculosis in our community.

Health workers should educate the public about the effects of tuberculosis and the importance of preventing tuberculosis in their families which leads to the development

LIST OF ABBREVIATIONS AND ACRONYMS.

ART: Antiretroviral Therapy

CDC: Centre for Disease Control & Prevention

DHO: District Health Officer

HIV/AIDS: Human Insufficiency Virus / Acquired Insufficiency Syndrome

ICT: Information Communication Technology

KSHS: Kampala school of Health Sciences

MDR-TB: Multi-drugs resistant Tuberculosis

OPD: Outpatient Department

TB: Tuberculosis

WHO: World Health Organization

CONFLICT OF INTEREST

There was no conflict of interest

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