THE PREVALENCE AND IMPACT OF TUBERCLOSIS IN HIV INFECTED PATIENTS IN BUSHENYI DISTRICT; A CASE STUDY OF HIV CLINIC AT KAMPALA INTERNATIONAL UNIVERSITY, TEACHING HOSPITAL

BY

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A RESEARCH REPORT SUBMITTED TO FACULTY OF CLINICAL MEDICINE AND DENTISTRY OF KAMPALA INTERNATIONAL UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR DEGREE IN MEDICINE AND SURGERY

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DECLARATION

I Aryamumpa Kenneth hereby declare that this research report has been done by me according to the research regulations of Kampala International University and that it has not been submitted to any other institution of learning for award of any qualification.

Signature……..... Date……

Aryamumpa Kenneth

BMS/0271/123/DU

APPROVAL

I affirm that this research report titled “the prevalence and impact of Tuberculosis among HIV infected patients in Bushenyi district” is being supervised in accordance to the plans of supervision of research report laid down by Kampala International University.

Signature: ……..…… Date ……..…..

Dr. Ekuru Simon Peter

DEDICATION

This research report is dedicated to my beloved my parents who have always backed me throughout the course of my study.

ACKNOWLEDGEMENT

I am so grateful to the almighty God for the gift of life he has endured to me and his guidance in this course.

I also acknowledge the support, guidance and pieces of advice from my beloved parents which has guided me through the course. I am also grateful to my brothers, sisters and my friends who have always encouraged me whenever I would lose hope. I am really so grateful for everyone' support. Finally, I appreciate the wisdom and guidance of my research supervisor Dr. Ekuru Simon Peter who is guiding me through this research study.

Acronyms

ART: Antiretroviral therapy

DOTS: Directly Observed Treatment, Short-Course

HIV: Human Immunodeficiency Virus

HIV/AIDS: Human immunodeficiency virus infection and acquired immune deficiency syndrome

PLHIV: People living with human immunodeficiency virus

IPT: Isoniazid Preventive Therapy

IRIS: Immune Reconstitution Inflammatory Syndrome

MDR-TB: Multi-drug-resistant tuberculosis

NACO: National AIDS Control Organisation

NAFOPHANU: National Forum for People Living with HIV/AIDS Networks in Uganda

TAFU: Towards an HIV Free generation in Uganda

TB: Tuberculosis

TST: Tuberculin Skin Test

UPHIA: Uganda Population Based INV impact Assessment

USAID: United States Agency for International Development

VLS: Viral Load Suppression

WHO: World Health Organization.

Definition of Variables

TB: Tuberculosis (also known as "TB") is a disease caused by a type of bacteria called Mycobacterium tuberculosis. TB mainly infects the lungs, although it can also affect other organs. When someone with untreated TB coughs or sneezes, the air is filled with droplets containing the bacteria.

HIV: HIV stands for human immunodeficiency virus. It is the virus that can lead to acquired immunodeficiency syndrome. HIV attacks the body's immune system, specifically the CD4 cells (T cells), which help the immune system fight off infections

Co-infection: Co-infection is the simultaneous infection of a host by multiple pathogen species.

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ABSTRACT

The aim of the study was to establish the prevalence and impact of Tuberculosis in HIV-infected patients in Bushenyi district; using a case study of HIV clinic at Kampala International University, Teaching Hospital. The specific objectives of the study were to establish the prevalence of Tuberculosis in HIV-infected patients in Bushenyi district; to assess the impact of Tuberculosis in HIV-infected patients in Bushenyi district and to find out the ways of preventing and treating Tuberculosis among HIV- infected patients in Bushenyi district. The researcher adopted a cross-sectional research design for the study; a sample of 252 respondents was studied; both primary and secondary data was used; simple random sampling methods was used to select respondents; the researcher used questionnaires and interview guides to collect the data; the data was analyzed using Excel and SPSS to generate cross tabulation tables, frequency and descriptive tables that were used to present data.

The study found out that the prevalence TB among HIV- infected clients at KIU-TH was at 7.14%; the findings suggested that TB is still a common problem among patients receiving ART and TB was identified to be one of the leading causes of death among the HIV patients. A timely health education on the control of TB could the prevent of TB; the hospital also had IPT (anti-TB drug) which helped the clients on the control of TB; KIU-TH had a Gin expert machine for testing TB suspects as one way of identifying the TB patients and isolating them from the TB free clients.

Basing on the study findings, the researcher recommended that health workers should put more effort in health education of the clients to bring down the prevalence of TB with its associated risks. The researcher also recommended that more counseling sessions on taking anti-TB should be extended to all HIV infected patients should be conducted oftenly as one of the ways to give them more knowledge on the TB and its control to reduce the mortality rate of HIV-infected clients who die due to TB

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter presents the background to the study, statement of the problem, objectives, the research questions, scope and significance of the study.

1.1 Background

HIV/AIDS is a continuing health problem globally that causes considerably high morbidity and mortality especially in resource-limited countries. It has so far caused more than 35 million deaths since its discovery, and as of 2015, there were about 37 million people who were living with HIV/AIDS (UNAIDS, 2016) Sub-Saharan Africa (SSA) is the most struck region of the world which harbors about 71% of the world's burden of HIV/AIDS (WHO, 2015) of whom more than 1.4 million people are living in Tanzania, representing 4% of all people living with HIV/AIDS globally (Martin, 2011)

The HIV virus infects CD4-positive cells as its host cells in which it replicates causing progressive lysis and reduction of the number and quality of functional immune cells (Alexaki, 2013) With time, the body fails to control the viral replication and immune paresis sets in, being marked by low CD4 counts with increased morbidity and mortality from opportunistic infections with tuberculosis being the most common opportunistic presentation at HIV diagnosis (UNAIDS, 2016). TB/HIV is the most common coinfection which still carries high mortality and morbidity worldwide. The 2016 WHO report indicates that, in 2015, there were 10.4 million new TB cases worldwide with 11% of these cases being HIV coinfected. Additionally, there were 1.8 million deaths worldwide with 0.4 million occurring among HIV-positive patients (Alexaki, 2013. Tuberculosis occurs as the first manifestation of HIV/AIDS in more than 50% of HIV-positive patients and deaths that are linked to TB are significantly high especially in sub-Saharan Africa, where in some countries, this rate is reported to be in excess of 50% (WHO, 2015)

Globally, the total number of people living with human immunodeficiency virus (HIV) reached 34.0 million (31.6 – 35.2 million) worldwide by the end of 2010 (WHO, 2016) with the majority in Sub-Saharan Africa. One-third of HIV-infected people are estimated to be co-infected with Mycobacterium tuberculosis (TB) which can activate or reactivate during the initiation of antiretroviral therapy (ART) due to immune reconstitution inflammatory syndrome (IRIS). However, TB incidence rates vary according to geography and patients' degrees of immune-suppression. The incidence proportion of active TB in HIV-infected patients with latent TB

infection is about 10% per year compared to 10% per lifetime for an HIV-uninfected individual; TB is a leading cause of HIV-related death (Mazibuko, 2013)

In India, by December 31, 2010, a total of 32,27,557 persons from high risk groups were screened for HIV antibodies by National AIDS Control Organization (NACO), from the inception of the National AIDS Control Programme in 2010, and 71,400 (2.21%) were found to be seropositive. In Delhi, 0.4% of the 3,17,103 persons similarly screened were found HIV positive. The major high risk groups included heterosexually promiscuous, intravenous drug abusers and blood donors. But, there is very little information on HIV seropositivity among tuberculosis patients in India. It has been suggested that tuberculosis and gastro-intestinal diseases might increase in seropositive individuals and vice versa. Tuberculosis often appears before other opportunistic infections occur in persons infected with HIV (Global HIV statistics, 2016).

In African developing countries, TB is the most common opportunistic infection and a leading killer of people living with HIV/AIDS (PLWHA) (Zwang, 2012). The risk of developing tuberculosis (TB) is estimated to be between 26 and 31 times greater in people living with HIV (PLHIV) than among those without HIV infection. In 2013, there were 9 million new cases of TB, of which 1.1 million were among people living with HIV in the world (Silveira, 2014). With HIV pitching in, TB incidence levels could go up close to 2.0 million or more per year in India, assuming HIV rates close to 1 percent and the incidence of TB remaining at 2000 levels. Therefore, the task of controlling the dual epidemic of TB and HIV/AIDS remains a major challenge for the country. HIV fuels the TB epidemic in several ways. HIV promotes the progression to active TB disease, both in people with recently acquired TB infection and with latent M. tuberculosis infection. HIV is the most powerful risk factor for reactivation of latent tuberculosis infection to active disease. HIV infected persons are more susceptible to becoming infected with TB when exposed to M. tuberculosis. HIV increases the rate of recurrent TB disease, which may be due to either endogenous reactivation (true relapse) or exogenous re-infection (Agizew, 2010)

TB/HIV is the most common co-infection which still carries high mortality and morbidity worldwide. The 2016 WHO report indicates that, in 2015, there were 10.4 million new TB cases worldwide with 11% of these cases being HIV co-infected. Additionally, there were 1.8 million deaths worldwide with 0.4 million occurring among HIV-positive patients (Mazibuko, 2013) Tuberculosis occurs as the first manifestation of HIV/AIDS in more than 50% of HIV-positive patients, and deaths that are linked to TB are significant high especially in sub-Saharan Africa,

where in some countries, this rate is reported to be in excess of 50% (Global HIV statistics, 2016). The advent of ART has generally improved the prognosis of PLHA (CDC, 2014) as reflected by an overall reduction of HIV/AIDS-related morbidity and mortality and improved survival among PLHA (WHO, 2016). With use of ART, occurrence of TB has been reduced by 67–80% in most study settings. Even with these advantages of ART, still a significant proportion of patients on ART develop active TB with a varying prevalence rate of 2.5–30.1% in most studies (WHO, 2016) Recent trial data have shown that early initiation of ART (within two weeks) during TB therapy can improve survival for patients with co-infection. Guidelines and policies on joint HIV/TB interventions have been developed to promote synergies between TB and HIV/AIDS prevention and care activities, aimed at reducing morbidity and mortality in co-infected patients. On the other hand, joint treatment containing ART and anti-TB drugs may be complicated by overlapping toxicity profiles, complex drug-drug interactions, and IRIS (Mazibuko, 2013).

In 2015 at the start of TAFU program, 140,000 children 0-14 years were estimated to be living with HIV (Ministry of Health, 2015) of which only 42% were on treatment. In 2016, UNAIDS estimated that 96,000 children under the age of 14 years were living with HIV in Uganda; 62% were on Anti-retroviral treatment (UNAIDS 2016). Besides, ARV coverage for HIV exposed children born to women living with HIV remains low estimated at 25%and most paediatric HIV prevention and care services were largely health facility based thus unable to reach hard-to-reach children to enroll or link them to care. The TAFU program was conceived to mobilize communities and create awareness around paediatric HIV prevention and treatment, empower families of affected children and enhance child friendly services through support to especially the lower level health facilities as well as galvanize community referral and linkage systems.

The Uganda Population-Based HIV Impact Assessment (UPHIA), a household-based national survey, was conducted from August 2016 to March 2017 to assess the progress of Uganda's national HIV response. UPHIA offered household-based HIV counseling and testing, with the return of results and referral to clinics for those who tested HIV positive, and collected information about the uptake of HIV prevention, care, and treatment services. The survey estimated HIV incidence, viral load suppression (VLS), and the prevalence of HIV, syphilis, and active hepatitis B virus infection at a population level. This survey is the first in Uganda to measure population-level VLS (UPHIA, 2017). The results provide information on national and regional progress toward control of the HIV epidemic that the prevalence of HIV among adults aged 15 to 64 in

Uganda is 6.2%: 7.6% among females and 4.7% among males. This corresponds to approximately 1.2 million people aged 15 to 64 living with HIV in Uganda. HIV prevalence is higher among women living in urban areas (9.8%) than those in rural areas (6.7%).The prevalence of HIV among children aged 0-14 is 0.5% which corresponds to approximately 95,000 children living with HIV in Uganda. The prevalence of VLS among all HIV-positive adults aged 15 to 64 in Uganda is 59.6%: 62.9% among females and 53.6% among males. The prevalence of VLS in children aged 0-14 is 39.3% (UBO, 2017).

HIV is the strongest risk factor for developing tuberculosis (TB) disease in those with latent or new Mycobacterium tuberculosis infection. The risk of developing TB disease is between 20 and 37 times greater in people living with HIV (PLHIV) than among those who do not have HIV infection. TB is the leading cause of HIV-related hospitalization and mortality-accounting for around one quarter (27%, with range of 20-34%) of deaths among hospitalized HIV-positive adults, and almost a third (30%, with range of 11-49%) of deaths among HIV-positive children (WHO HIV/TB update, 2015). At present in Uganda, an estimated 45% of TB patients are also infected with HIV. While less than 1% of HIV patients in care are diagnosed with TB- far below the expected range of 4-25%. The Uganda National TB and AIDS Control Programs work together to implement a set of collaborative TB/HIV activities to reduce the burden of TB in PLHV and reduce the burden of HIV in patients with presumptive and diagnosed TB. The Uganda MOH recommends TB and HIV services to be provided at a single facility at the same time and location (one-stop shop service). A patient receives all the services they require during one consultation. It includes TB clinic providing HIV treatment and HIV clinic providing TB treatment.

1.2 Statement of the problem

In order to achieve an AIDS-free generation, the UNAIDS has set an ambitious target code named 90-90-90, which aims to ensure that 90% of all people living with HIV will know their status, 90% of all people diagnosed will receive sustained antiretroviral therapy (ART), and 90% of all people receiving ART will have viral suppression, all by 2020 (UPHIA, 2016). To achieve this target, countries will need to review the current programs to identify the potential barriers that might hinder the achievement of these goals. In Uganda, a country historically hit hard by the epidemic, progress has been made but more is left to be done to achieve these UNAIDS targets. The adult HIV prevalence is still high at 6.2% in the general population, based on the 2017 national serosurvey (UPHIA, 2016). The Uganda National TB and AIDS Control Programs work together

to implement a set of collaborative TB/HIV activities to reduce the burden of TB in PLHV and reduce the burden of HIV in patients with presumptive and diagnosed TB. The Uganda MOH recommends TB and HIV services to be provided at a single facility at the same time and location (one-stop shop service). A patient receives all the services they require during one consultation. It includes TB clinic providing HIV treatment and HIV clinic providing TB treatment (Nakigozi, 2013).

Despite the above effort, tuberculosis remains a major public health problem in Uganda with an annual incidence of 330 cases of all forms and 136 new smear positive cases per 100,000 people per year. The expected case load per year is 102,000 (WHO, 2016). The 2010 Global WHO Report ranked Uganda 16th among the 22 TB high burden countries. Uganda like most of Sub-Saharan Africa is battling with the dual Tuberculosis and HIV/AIDS epidemic. The HIV prevalence in the general population is 6.4% (National HIV Behavioral Sero-Survey, 2011). It is estimated that about 60% of the TB patients are co-infected with HIV/AIDS. This dual epidemic has resulted in a fourfold increase in the notification numbers of TB cases in the region. Furthermore TB stands as the number one killer of HIV/AIDS patients. The clinical presentation of TB among the dually infected persons changed and this has a bearing on the clinical management and design of public health interventions to respond to the dual epidemic (UAC, 2015).

Uganda is one of the few high TB burden countries were TB figures have not improved in recent years, with an estimated TB incidence in 2015 of 552 cases per 100000 people (WHO, 2015). With 58% of all notified TB cases in the world being HIV-positive, Uganda also has one of the highest TB/HIV co-infection rates in Africa; however the Ministry of Health and other private research organisations in Uganda have not put much emphasis like what they have put on HIV/AIDS on it as in establishing its prevalence in different parts of the country, its impact and how it can be managed. If this is not done fast, the spread of TB among HIV-infected patients will not stop and more will continue to die due to TB; therefore, this study was conducted in KIU-TH, Bushenyi district to help the policy makers in filling this gap.

1.3 Purpose of the study

The purpose of the study was to establish the prevalence and impact of Tuberculosis in HIV-infected patients in Bushenyi district; using a case study of HIV clinic at Kampala International University, Teaching Hospital

1.4 Specific Objectives of the study

i. To establish the prevalence of Tuberculosis in HIV-infected patients in Bushenyi district
ii. To assess the impact of Tuberculosis in HIV-infected patients in Bushenyi district
iii. To find out the ways of preventing Tuberculosis among HIV- infected patients in Bushenyi district

1.5 Research questions

i. What is the prevalence of Tuberculosis in HIV-infected patients in Bushenyi district?
ii. What is the impact of Tuberculosis in HIV-infected patients in Bushenyi district?
iii. How can Tuberculosis among HIV- infected patients in Bushenyi district be prevented?

1.6 Scope of the study

1.6.1 Geographical scope

The study was conducted from Kampala international University-Teaching hospital in Ishaka-Bushenyi Municipality, Bushenyi district. Bushenyi district is located in the western region of Uganda, approximately 280 kilometers from Kampala the capital city of Uganda.

1.6.2 Content scope

In this study, the focus was on establishing the prevalence and impact of Tuberculosis in HIV-infected patients in Bushenyi district; using a case study of active HIV-patients attending the HIV clinic at Kampala International University, Teaching Hospital

1.6.3 Time scope

The research was carried out in a period of six months i.e. from February 2019 to July 2019.

1.7 Significances of the study

The results of this study may contribute to the existing breadth of literature available on the prevalence, impact and Prevention of TB among HIV/AIDS patient.

The findings of the study may provide adequate knowledge to the Prevention of KIU-TH and other HIV facilities to train and empower its staff the prevention and treatment of TB among HIV-infected clients.

The study finding will bring up strategies for the HIV patients on how to prevent the spread of TB among them as one way of reducing mortality in HIV clients.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This Chapter presents a review of existing literature from previous studies conducted on health seeking behavior. The aim of this review was to avail different findings on the objectives of the researcher's current study.

2.1 The prevalence of Tuberculosis among HIV-infected patients

The incidence proportion of active TB in HIV-infected patients with latent TB infection is about 10% per year compared to 10% per lifetime for an HIV-uninfected individual (WHO, 2018). National TB programmes in the high HIV burden countries are reporting increasing case fatality rates of up to 25 percent in the smear positive and 40-50 percent in smear-negative pulmonary TB patients (Hargreaves & Scano, 2013). A total of 637 TB cases aged 18–47 years were diagnosed in the district of Manchaca in 2011, of which 53.4% were male and 278 (43.6%) were confirmed by sputum smear. Bacteriological confirmation was higher among HIV-negative than HIV-positive TB cases (62.2% versus 39.4% respectively, p=0.001). The prevalence of HIV among confirmed TB cases aged 18–47 years was 77.2% (206 out of 267). Only 15.0% of patients were reported to be on antiretroviral therapy (ARVs) at TB diagnosis or during TB treatment (Burazeri & Kark, 2011).

Among PLHIV, 14.6% of confirmed TB cases died during TB treatment, compared with none among HIV uninfected adults. The estimated TB incidence rate among adults aged 18–47 years was 456 per 100000 populations. The incidence rate of confirmed TB among PLHIV aged 18–47 years was 847 per 100000 (VR 772–941), compared with 168 per 100000 (VR 158–180) among HIV-negative population. Among HIV-positive male and female adults, the highest TB incidence rate was observed in those aged 38–47 years, with 2014 and 861 cases per 100000 males and females, respectively (Kruk, 2011).

Tuberculosis (TB) remains an important public health concern and a leading cause of disease and death worldwide. Mozambique is one of the few high TB burden countries where TB figures have not improved in recent years, with an estimated TB incidence in 2013 of 552 cases per 100000 population (Global HIV statistics, 2016). With 58% of all notified TB cases being HIV-positive, Mozambique also has one of the highest TB/HIV co-infection rates. Published data on the burden

of TB or HIV disease in the country are scarce, and improving epidemiological surveillance has been identified as an urgent step to improve TB control

People living with HIV (PLHIV) are at a higher risk of developing active TB, which is the main cause of death among this population, accounting for 26% of AIDS-related deaths. It has been estimated that in the African region, 31% of new TB cases in adults were attributable to HIV infection. Most TB incidence measurements among HIV patients come from HIV cohorts, clinical trials or mathematical modeling using various strategies described elsewhere (Global HIV statistics, 2016). The study was conducted at the Manchaca Health Research Centre (CISM), located in the rural district of Manchaca, southern Mozambique (Mwinga, 2011). This retrospective, population-based epidemiological analysis used three data sources: TB notification data were obtained from the 2011 registries of the National TB Control Program for the District of Manchaca, based on passive surveillance; the population at risk was calculated from the latest official census data (2012) for the District of Manchaca, obtained through the Mozambican National Statistics Institute, and the estimated population growth for 2007–2011, using annual data from CISM's Demographic Surveillance System; and HIV prevalence in the district population was estimated using community-based HIV seroprevalence data from a survey conducted in 2010 (which only included adults aged 18–47 years.

A total of 637 TB cases aged 18–47 years were diagnosed in the district of Manchaca in 2011, of which 53.4% were male and 278 (43.6%) were confirmed by sputum smear. Bacteriological confirmation was higher among HIV-negative than HIV-positive TB cases (62.2% versus 39.4% respectively, p=0.001). The prevalence of HIV among confirmed TB cases aged 18–47 years was 77.2% (206 out of 267). Only 15.0% of patients were reported to be on antiretroviral therapy (ARVs) at TB diagnosis or during TB treatment. Among PLHIV, 14.6% of confirmed TB cases died during TB treatment, compared with none among HIV uninfected adults (Mwinga, 2011). The estimated TB incidence rate among adults aged 18–47 years was 456 per 100000 population; The incidence rate of confirmed TB among PLHIV aged 18–47 years was 847 per 100000 (VR 772–941), compared with 168 per 100000 (VR 158–180) among HIV-negative population. Figure 1 shows age and sex-specific TB incidence rates. Among HIV-positive male and female adults, the highest TB incidence rate was observed in those aged 38–47 years, with 1884 and 861 cases per 100000 males and females, respectively.

2.2 The impact of Tuberculosis in HIV-infected patients

Tuberculosis (TB) remains an important public health concern and a leading cause of disease and death worldwide. Mozambique is one of the few high TB burden countries where TB figures have not improved in recent years, with an estimated TB incidence in 2013 of 552 cases per 100000 people (WHO, 2013). With 58% of all notified TB cases being HIV-positive, Mozambique also has one of the highest TB/HIV co-infection rates in Africa. Published data on the burden of TB or HIV disease in the country are scarce, and improving epidemiological surveillance has been identified as an urgent step to improve TB control (Getahun, et al., (2010). People living with HIV (PLHIV) are at a higher risk of developing active TB, which is the main cause of death among this population, accounting for 26% of AIDS-related deaths. It has been estimated that in the African region, 31% of new TB cases in adults were attributable to HIV infection (Corbett, 2014).

TB/HIV is the most common co-infection which still carries high mortality and morbidity worldwide. The 2016 WHO report indicates that, in 2015, there were 10.4 million new TB cases worldwide with 11% of these cases being HIV co-infected. Additionally, there were 1.8 million deaths worldwide with 0.4 million occurring among HIV-positive patients (WHO, 2016). Tuberculosis occurs as the first manifestation of HIV/AIDS in more than 50% of HIV-positive patients (WHO, 2014), and deaths that are linked to TB are significant high especially in sub-Saharan Africa, where in some countries, this rate is reported to be in excess of 50% (WHO, 2011). A recent meta-analysis of cohort studies assessing the effect of TB on mortality in persons with HIV infection found that TB was associated with an overall twofold increase in mortality (Straetemans et al, 2010). However, when restricted to a subset of six studies conducted in the ART era, TB co-infection no longer had a significant impact on survival. None of the ART-era studies were conducted in an industrialized country, and authors recommended that further studies are needed to be conducted in different settings, with the inclusion of documentation of exposure and adherence to ART.

HIV/AIDS is a continuing health problem globally that causes considerably high morbidity and mortality especially in resource-limited countries. It has so far caused more than 35 million deaths since its discovery, and as of 2015, there were about 37 million people who were living with HIV/AIDS (UNAIDS, 2016). Sub-Saharan Africa (SSA) is the most struck region of the world which harbors about 71% of the world's burden of HIV/AIDS (WHO, 2015) of whom more than 1.4 million people are living in Tanzania, representing 4% of all people living with HIV/AIDS

globally (MOHSW, 2014). The HIV virus infects CD4-positive cells as its host cells in which it replicates causing progressively sis and reduction of the number and quality of function a immune cells (Martin & Sattentau, 2012). With time, the body fails to control the viral replication and immune paresis sets in, being marked by low CD4 counts with increased morbidity and mortality from opportunistic infections with tuberculosis being the most common opportunistic presentation at HIV diagnosis (Brooks et al., 2011).

2.3 Prevention Tuberculosis among HIV- infected patients

Careful counseling, clinical monitoring, and good patient education regarding when to stop treatment and seek advice can help in reducing the risk of toxicity (Mazibuko, 2013); The Stop TB Strategy of directly observed therapy short-course (DOTS)–based TB programs help prevention of TB by reducing transmission through prompt identification, diagnosis, and successful treatment of TB (Churchyard, 2012). Although strong DOTS-based TB programs are essential, prevention of HIV infection is necessary to control TB in areas impacted by HIV. Prevention of HIV infection is beyond the scope of this article but is best achieved with a carefully tailored, combined approach that considers the community and incorporates evidence-based behavioral, biomedical, and structural interventions (Piot, 2010). ART offers considerable hope for prevention of HIV infection and TB, because risk of TB approaches 10%– 20% per annum among persons with a CD4 cell count !200 cells/mL [21–25].

Perhaps most importantly for TB control, persons receiving ART are less likely to transmit HIV. Combined approaches to prevention of HIV infection can be very effective. For example, providing couples HIV counseling and testing and ART for HIV status–discordant couples in Africa has been associated with an∼98% reduction in HIV transmission. Prevention of HIV infection in TB care settings has received some attention; however, the provision of services for prevention of HIV infection in these settings is not well documented. In addition, services often do not incorporate proven interventions, such as couples counseling (WHO, 2011) or other efforts to diagnose HIV infection or prevent HIV transmission among patients, partners, and family members. This missed opportunity for prevention of HIV infection is often compounded by the persistently low case detection of HIV infection–related TB. Expansion of intensified case findings for both TB and HIV infection could ensure that many more persons know their TB and HIV status

and that persons with HIV infection with and without TB have access to appropriate and timely prevention, care, and treatment (WHO, 2015).

Despite the risk of nosocomial TB, infection control for TB is often overlooked as a TB prevention intervention. The unprecedented expansion of HIV services in areas with high prevalence of TB (WHO, 2011) may be amplifying nosocomial TB transmission among vulnerable patients and their families. Transmission of extensively drug-resistant or multidrug-resistant (MDR) TB further emphasizes the importance of infection control, because of the nearly 100% fatality seen among people living with HIV in some settings. Serious outbreaks of TB in health care settings among people living with HIV and health care workers have been reported, and health care workers infected with HIV are at elevated risk of TB. Preventing TB transmission in health care facilities (and other settings, such as prisons and the community) may play a significant role in preventing TB in patients infected with HIV, their families, and health care workers. WHO guidelines focus on implementing evidence-based managerial, administrative, environmental, and personal respiratory protection; In 2009, 127 countries had TB infection-control policies for hospitals and clinics; in sub-Saharan Africa, 20 of 46 countries report having policies covering 74% of estimated HIV infection–related TB. Opportunities exist for improved implementation of infection control for TB as part of prevention, care, and treatment of HIV infection and TB for patients, family members, and health care workers (WHO, 2010)

In 2010, the WHO and the United Nations Joint Programme on HIV/AIDS (UNAIDS) issued a new IPT policy with 6 key steps as a part of the package of care for people living with HIV (WHO, 2011); First, people living with HIV should be counseled to encourage early diagnosis and treatment of TB. Second, to avoid mono therapy, all persons infected with HIV should be screened for active TB before administration of IPT. Third, programs should target persons most likely to benefit from IPT, specifically individuals with a positive tuberculin skin test (TST) result. However, TST is not feasible in most settings, and therefore, IPT without prior TST should be considered in populations with 130% prevalence of M. tuberculosis infection, health care workers, household contacts of patients with TB, prisoners, and miners. Fourth, IPT should be given as 6 months of daily, self-administered isoniazid. The fifth and sixth key steps involve monitoring of adherence, toxicity, and outcomes; the policy recommends a chest radiograph before initiation of IPT (WHO, 2016). Studies suggest that IPT is cost effective and beneficial, further supporting these policy recommendations. The 2008 WHO/UNAIDS policy (USAID, 2008) informed

subsequent WHO guidelines, including the HIV/TB Clinical Manual, national TB program managers' guidelines for preventing and treating TB in children, and the 2004 Interim Policy on TB/HIV Collaborative Activities. The 2008 WHO Three I's Meeting for HIV/TB reemphasized the importance of IPT for people living with HIV as part of a comprehensive approach to prevention, care, and treatment of HIV infection. Forty-two countries, including Botswana, South Africa, Mozambique, Ethiopia, and the United States, use IPT for people living with HIV as part of their TB-control strategy. Globally, although access to IPT is still limited, from 2005 through 2007, IPT provision increased from 26,000 persons in 10 countries to 29,000 persons in 42 countries. To support access to IPT for people living with HIV, the WHO is working with experts to formulate new intensified case findings for TB and IPT guidelines, which should help national AIDS programs, take the lead in improving TB screening and IPT service delivery (Mazibuko, 2013).

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter comprises of methods that was used in this study. It included the study design, study population, sample size determination, sampling procedures, sources of data, data collection techniques, tools, data analysis, ethical considerations.

3.1 Study design

A cross sectional study design was used to establish the prevalence and impact of Tuberculosis in HIV-infected patients in Bushenyi district. The Cross sectional study design was used because it enables a researcher to collect data at a given period of time as reflected by the general situation in the study area.

3.2 Study population

The target population was comprised of 692 clients' active HIV-infected patients (HMIS 106 report, 2018). The researcher also involved all the 4 health workers in the HIV-clinic of KIU-TH who will be the key informants on the impact and Prevention of TB.

3.3 Sample size determination

A sample refers to the proportion of the population (Enukoha et al, 2011). The researcher used Solven's (1960) formula of sampling that states as;

$n=N/ (1+N (e^2))$

Where n= sample size

N= population

e=standard error

Therefore, $n= 696/ (1+699(0.05^2)$

$\underline{n=254}$ in this case therefore; the researcher studied a sample of 254 participants

Table 3.1: Distribution of the respondents

Category	Frequency	Sampling technique
HIV clients	252	Simple random sampling
Health workers	2	Purposive sampling
Total	**254**	

3.4 Sources of data

The researcher collected both secondary data and primary data. Secondary data was collected to find out the prevalence of TB-HIV co-infection from the registers, and primary data was collected from all the participants.

3.5 Sampling technique

The researcher used simple random sampling to select the study respondents. According to Moore et al (2006), simple random sampling provides an equal and unsystematic chance of selection of both variables. Simple random sampling helped the researcher balance representation of demographics of these respondents to get unbiased data.

3.6 Data collection tools

The researcher used a questionnaire, interview guide and an observation checklist in collecting data

3.6.1 Questionnaire

Health workers in the study area were given questionnaires to fill. The questionnaires included the questions in attempt to answer objectives two and three of the study.

3.6.2 Interview guide

An interview guide was used to collect information from the HIV-clients who participated in the study. This was used because it is fast and most of these clients do not know how to read and write.

3.6.3 Observation check list

An observation check list was used to collect secondary data that was guide the researcher in analyzing the prevalence of TB in HIV-infected clients at KIU-TH.

3.7 Data analysis

After coding, data was analyzed using Excel to generate graphs and frequency tables that aided the researcher in the discussion of the findings and generating conclusions.

3.8 Ethical Consideration

3.8.1 Consent: The researcher explained the essence of the study to the participants so as to create a rapport and trust from them; those who were willing to participate in the study will sign the consent form.

3.8.2 Confidentiality: The responses from the respondents were not shared among other participants not included in a study. This ensured confidentiality of their opinions.

3.8.3 Respect for respondents: All respondents were treated equally with utmost respect. No respondent was discriminated and victimized using the information obtained.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

The researcher presented her findings and interpretation to guide her in conclusion and recommendations. The data was presenter in relation to the study objectives and questions.

4.1 Background Information

Table 4.1: the table showing the descriptive statistics of the demographic information

Characteristic	Frequency	Percentage
Sex		
Male	103	41%
Female	149	59%
Age Group		
Less than 20 years	139	55%
20-30 years	47	19%
31-40 years	42	17%
Above 40 years	24	9%
Marital Status		
Single	48	19%
Married	107	42%
Separated	66	26%
Widow/er	33	13%
Level of Education		
None	76	30%
Certificate	134	53%
Diploma	25	10%
Bachelors	15	6%
Post graduate	3	1%

Source: Primary data, 2019

In this study;

Most of the study respondents were female (59%) and only 41% of the respondents were males.

55% of the respondents were less than 20 years of age; 19% were in the age group of 20-30years; 17% were in the age group of 31-40 years and 9% were above 40 years.

19% of the study respondents were single; 42% were married; 13% were widow/ers and finally 26% had separated.

On the level of education, 53% were of certificate level; 30% had no education qualification; 10% were of diploma level; 6% were of bachelors' level and only 1% was of post graduate level.

4.2.1 The Prevalence of TB in HIV-infected clients by sex at KIU-TH

		TB status				Total
		Not reactive (Negative)		Reactive (positive)		
		Frequency	%ge	Frequency	%ge	
HIV patients	Male	93	41%	10	37%	103
	Female	132	59%	17	63%	149
Total		**225**	**100%**	**27**	**100%**	**252**

Source: Primary data, 2019

The table above shows the preference of TB among HIV-infected clients at KIUTH.

From the table above, of the 27 respondents who had reactive (positive results); Majority (63% [17]) were female and only 37% (10) were male.

4.2.2 The Prevalence of TB in HIV-infected clients at KIU-TH

TB status	Frequency	Percentage
Negative	234	92.86%
Positive	18	7.14%
Total	**252**	**100.00%**

Source: Primary data, 2019

The table above shows that the prevalence of TB among HIV clients at Kampala International Teaching Hospital is 7.14%.

4.4 Prevention of TB among the HIV-Infected clients

4.4.1 Patients responses on TB prevention

Response	Frequency	Percentage
Attending health education on TB	164	65%
Taking the full dose of Anti TB drugs	204	81%
Seeking for medication when every I get cough and TB signs	252	100%
Separate from the suspected TB patients	134	53%

Source: Primary data, 2019

From the table, all the clients responded that they seek for medication when every they get cough and any signs of TB; 81% responded that they had take the full dose of Anti-TB drugs (IPT); 65% of the clients responded that they attend health education on TB to know how to control TB; and 53% responded that they separate themselves from suspected TB patients.

4.4.2 Responses from health workers

The TB clinic in-charge KIU-TH (Mr. Kamyuka) responded that "I always give health talks on TB to all the HIV clients, as the clinic we give IPT drugs for six months to all our HIV clients; we put on face masks when handling TB clients; we widely open all the windows for proper airation; we have a separate patient's room for TB suspects and we recommend Genexpert for all suspects" **Primary data, 2019**.

The counselor TB clinic KIU-TH (Mr. Coleb) responded that "we counsel all the HIV clients to take well their drugs including anti-TB drugs; we give IPT drugs; we have all the TB testing machines if there is any suspect; we counsel clients not to share utensils most especially cups with the TB suspects" **Primary data, 2019**.

4.3 The impact of TB among HIV-infected clients at KIU-TH

Response	**Frequency**	**Percentage**
Negative	252	100%
Positive	0	0%
None	0	0%
Total	**252**	**100%**

Source: ***Primary data, 2019***

The findings in the table above show that all of the participants (100%) responded that TB has a negative impact on the HIV-infected clients.

CHAPTER FIVE: DISCUSSION OF THE STUDY FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents discussion of the study findings with respect to the study objectives, conclusions, recommendations and the areas for further studies.

5.1 Discussion of the study findings

On the first objective which was to establish the prevalence of TB among HIV-infected patients at KIU-TH, the researcher established that the prevalence TB among HIV- infected clients at KIU-TH was at 7.14% which was almost equal the national prevalence which is 7.4% and less that the worldwide prevalence which was at 11% (WHO, 2018).

On the second objective which was to find out the impact of TB among HIV-infected patients at KIU-TH; the study found out that TB had a negative impact on the health of HIV-infected clients as the health workers further explained that in was one of the leading causes of death among the HIV-infected clients. This was with WHO (2013) which stated that Tuberculosis (TB) remains an important public health concern and a leading cause of disease and death worldwide. Mwinga (2011) added that people living with HIV (PLHIV) are at a higher risk of developing active TB, which is the main cause of death among this population, accounting for 26% of AIDS-related deaths.

On the third objective which was to find out the prevention of TB among HIV-infected patients at KIU-TH; the study found out that the patients sought for medication when every they get cough and any signs of TB; they took the full dose of Anti-TB drugs (IPT); they attended health education on TB to know how to control TB; and they separated themselves from suspected TB patients

5.2 Conclusion

The prevalence TB among HIV- infected clients at KIU-TH was at 7.14%; the findings suggested that TB is still a common problem among patients receiving ART and TB was identified to be one of the leading cause of death among the HIV patients. A timely health education on the control of TB could the prevent of TB; the hospital also had IPT (anti-TB drug) which helped the clients on

the control of TB; KIU-TH had a Genexpert machine for testing TB suspects as one way of identifying the TB patients and isolating them from the TB free clients.

5.3 Recommendation

Basing on the study findings, the researcher recommended that health workers should put more effort in health education of the clients to bring down the prevalence of TB with its associated risks.

The researcher also recommended that more counseling sessions on taking anti-TB should be extended to all HIV infected patients should be conducted oftenly as one of the ways to give them more knowledge on the TB and its control to reduce the mortality rate of HIV-infected clients who die due to TB

The researcher recommended that IPT should be availed in all facilities for easy access of all HIV positive clients to enhance its uptake and reduce the prevalence of TB

5.4 Areas for further studies

The researcher suggested that other researchers may do research on the following;

i. The prevalence of TB among adults of 65 years and above
ii. Prevalence and factors associated with pulmonary tuberculosis among children 5-15 years attending
iii. Tuberculosis risk factors among tuberculosis patients in Bushenyi district

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APPENDICES

Appendix I: Questionnaire for health workers

My name is **Aryamumpa Kenneth;** I am conducting a research about "the prevalence and impact of Tuberculosis in HIV-infected patients in Bushenyi district". The questionnaire items are about the study; and I kindly request you to participate in responding to the questions below accordingly to help me getting the information needed in my research. The information given will be treated as confidential and the results of the study will be used for academic research purposes only.

PART A*:* Bio-data

Tick the correct response:

1. Sex

Male ☐ Female ☐

2. Age group

Less than 20 ☐

20-30 ☐

31-40 ☐

Above 40 ☐

3. Marital Status

Single ☐

Married ☐

Divorced / Separated ☐

Widowed ☐

4. Position held…….

5. Level of education

None

Certificate ☐

Diploma ☐

Bachelor degree ☐

Post graduate ☐

SECTION B: prevalence of TB in HIV-infected clients at KIU-TH

1. In your own opinion, what is TB?

.....
.....

2. What are the signs of TB?

……
……
……
……

SECTION C: The impact of TB among HIV-infected clients at KIU-TH

1. Does TB have any impact on the health of an HIV-infected client?

Yes ☐

No ☐

2. Give reasons for your answer in the above question

……
……
……

SECTION D: Prevention of TB among the HIV-Infected clients

1. How can TB be prevented by the HIV- infected clients?

……
……

2. Does TB in the HIV-infected clients have treatment?

Yes

No

3. If yes, what are the treatments of TB in the HIV-infected clients?

……
……

Thank you for your responses

Appendix II: Interview guide for HIV clients

1. Name …… (Optional)

2. Sex……..

3. Age……

4. Marital status……..

5 Education level……..

3. Have you ever had about TB?

4. If yes, what is TB?

5. What are the signs of TB among the HIV-infected patients?

6. Have you ever been a TB patient?

7. Do you think TB has any impact on the people who are HIV positive? What impact does it have?

8. Do you think TB in the HIV-infected clients has treatment?

8. Do you know the treatment of TB? If yes, what treatment is it?

9. Have you ever taken any preventative measure of TB?

10. If yes, what measures have you taken?

Thank you for your time

Appendix II: Observation Check list

S/N	Item
1	HIV clients who are co-infected with TB
2	HIV clients who are not co-infected with TB
3	HIV clients who are on TB treatment
4	HIV clients who are on TB preventive drugs

Appendix III: A Gantt chart showing a work plan of activities for the research work

S/N	Planned Activities	Jan 2019	Feb 2019	Mar 2019	Apr 2019
1	Development of concepts and ideas through consultations and discussions				
2	Selection of research topics and their approval				
3	Writing of reports and their submissions				
4	Data collection				
5	Submission of drafts				
6	Submission of final dissertation				

Appendix IV: Estimated Budget

Item	**Estimated Cost (Ugshs)**
Internet	30,000=
Stationary	80,000=
Printing Phase I (Reports)	30,000=
Data collection	150,000=
Printing Phase II (Reports)	60,000=
Binding	35,000=
Transport	50,000=
Airtime	20,000=
Consultation	50,000=
Miscellaneous	50,000=
Total	**555,000=**