

DECLARATION

I hereby declare that this report is my original work and has never been submitted either in partial fulfillment or full publication in any other university, or institution for the award of a diploma or degree.

I there for present it for the award of a Diploma in clinical medicine and community health at Kampala International University western campus.

Name:

Signature

Date

Ekemu William

APPROVAL

This report has been submitted with my approval as candidate's supervisor.

Signature: _____

Date: _____

DR. ODWEE AMBROSE

ACKNOWLEDGEMENT

I would like to acknowledge Kampala international university for granting me an opportunity to pursue my studies and also my supervisor Dr Ambrose for his valuable and constructive suggestions during the planning and development of this research work. His willness to give his time so generously has been very much appreciated.

I would also like to extend my thanks to the staff of Amuria health centre IV for their help in offering me the resources necessary for my research work.

Finally, I would like to thank my family and close friends for their support and encouragement throughout my studies.

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LIST OF ABBREVIATIONS

DHO	District Health Officer
HIV	Human immunodeficiency virus
AIDS	Acquired immune deficiency syndrome
TB	Tuberculosis
DOTs	Direct Observed Therapy
MOH	Ministry of Health
UNAIDS	United Nations AIDS
UAC	Uganda AIDS Commission
WHO	World Health Organization
UCG	Uganda Clinical Guidelines
SANAC	South African National AIDS Council
MDGs	Millennium Development Goals
MTB	Mycobacteria Tuberculosis
EPTB	Extra Pulmonary Tuberculosis
PTB	Pulmonary Tuberculosis
NTLP	National Tuberculosis and Leprosy Programme
TASO	The Aids Support Organization
UBS	Uganda Bureau of Statistics

OPERATIONAL DEFINITIONS

HIV: A retrovirus that infects the CD4+ cells of the immune system, destroying or impairing its function.

Tuberculosis: The infectious disease caused by *Mycobacterium tuberculosis*. It typically affects the lungs (pulmonary tuberculosis) but can also affect other sites (Extra pulmonary tuberculosis) as well in the body (WHO, 2011).

Prevalence: The number of both old and new cases of a disease occurring in a specific period of time.

Adult: Person above 18 years of age in Uganda is considered an adult (UBS, 2010).

Factors: Contributing causes to any action

ABSTRACT

Background

The prevalence of TB is increasing in many countries and is the leading infectious cause of death worldwide. Infection with HIV likewise, has emerged as the most important predisposing factor for developing TB in people co-infected with *Mycobacterium tuberculosis*.

The objective of study was to determine the prevalence and factors associated with Tuberculosis among HIV positive adults attending ART clinic in Amuria health Centre IV in Amuria district.

Methodology

A cross sectional study design, descriptive in nature was used in which a total of 150 clients participated.

Results

Majority of participants were aged 30-40 with 36%, of this patients, 97(64.67%) were female and 53(35.3%) were males. TB incidence was 7.33% males were sputum positive and sputum positive females were 5.33% which totaled to 12.66% positive respondents. Among the social exposure characteristics, exposure characteristics, 60.67% responded yes to asked questions and 39.33% replied no to the questions with 28% in Smoking cigarettes. Environmental factors, overcrowding showed highest percentage (16%), followed by non-permanent housing (15.33%).

Discussion

TB-HIV co-infection affected more males (7.33%) than female. Prevalence rate was high with 12%. Smoking (28%), alcohol use (18.67%) showed much relation socially and environmental factors was overcrowding (16%).

Conclusion and Recommendations.

The findings highlight, occupation, age (31-50), low education level, Smoking status, alcohol intake, and overcrowding, unemployment associated with TB co infection. There recommended need for on-going educational, informational and other interventions to address the risk factors of tuberculosis in HIV Adults in order to decrease the rate of TB co-infection.

CHAPTER ONE

1.0 Introduction

This chapter consisted of background (global, sub-Saharan Africa and Ugandan TB burden).

1.1 Background

Globally, it is estimated that 9.6 million people had TB by 2014 and about 1.5 million death resulted from TB (Alejandro et al. 2016). This infection with mycobacterium is very high with about 9 million new cases of active TB(G. WHO, 2011). HIV has contributed to a significant increase in the worldwide prevalence of TB by producing a progressive decline in cell-mediated immunity, which has led to high prevalence of 14.8% of TB- HIV co infection and as many as 50-80% having HIV co infection in parts of sub-Saharan Africa(G. WHO, 2011). According to 2012 roundup, the sum of 8.6 million prevalent cases of Tuberculosis (TB) globally, and 940000 deaths worldwide in 2012 indicate burden of tuberculosis(WHO, 2013).

In sub-Saharan Africa, it is estimated that the highest burden of TB falls in 22 countries and contributes 80% of the world's TB burden and this includes Uganda with an estimate of 65,000 cases(WHO, 2013). TB cases make up 25/100,000 in HIV positive patients(WHO, 2013). These has been ranked as the leading cause of death in HIV patients with high morbidities, many of whom die before TB is confirmed by laboratory methods(Moore et al., 2010). According to research by WHO, South Africa has the third highest burden of disease in the world, after India and China, with an estimated prevalence of 450 000 cases of active TB in 2013, with an increase of 400% over the last 15 years (WHO, 2014). An estimated 60-73% of the 450 000 cases have both HIV and TB infection. Various literatures indicate that, being in bed ridden condition of the functional status among TB/HIV co-infected patients demonstrated unsuccessful TB treatment outcome (Gesese et al. 2016).

However, Uganda is ranked as 18th out of 22 tuberculosis high burdened countries in the world and is the major health problem in Uganda with an annual risk of TB infection 3% (Guwatudde et al., 2010). Uganda's TB prevalence rate was 179/100,000 in 2012 and 54% of TB patients were HIV positive(WHO, 2013).

The fight to end TB endemic is one of the main components of the global strategy to fight TB is the World Health Organizations' (WHO) DOT Short-course regimen. The five central tenants of DOTS are; political commitment with increased and sustained funding, case detection through quality assured bacteriology, standardized treatment with supervision and treatment support, a continuous drug supply and management system, monitoring and evaluation system and impact measurement(G. WHO, 2011). Uganda's National TB Control Program officially follows WHO recommendations on DOTS (Western Zone National TB/Leprosy programme Uganda-Annual TB/Leprosy report, 2009), however the high prevalence and mortality discussed above suggest that the program is not working well, likely because of underfunding leading to gaps between official TB program guidelines and implementation in the districts. This has made TB control an ongoing challenge for Uganda and the MDGs has not been reached(WHO, 2013).

Mycobacterium tuberculosis typically affects the lungs (pulmonary tuberculosis) but can also affect other sites (Extra pulmonary tuberculosis) as well in the body (WHO, 2013). TB interaction with HIV among HIV positive adults has been documented as the most public health challenges in sub-Saharan Africa(Belay et al, 2015). Studies across regions have consistently documented high TB prevalence in the first months of ART(Rajasekaran et al, 2015). By bacillus Mycobacterium tuberculosis (MTB) and Pulmonary tuberculosis (PTB) being the most common form of TB in humans occurring in over 80% of cases (SANAC, 2009). Done researches found out that even in HIV patients, PTB is still the commonest form of TB and presentation depends on the severity of immune suppression and clinical picture often resemble post primary PTB and later resemble primary PTB(NTLP., 2011). Sputum often appears positive for both early and late stages of HIV infection, chest x-ray appears early as cavities and late as infiltrations. Extra-pulmonary TB (EPTB) in HIV is usually pleural effusion, lymphnodes, pericarditis, military, meningitis and disseminated TB with mycobacteraemia and these implies severe HIV disease according to WHO classification stage 4 (NTLP., 2011).

Diagnosis of TB in HIV infected patient methods involves several methods which include sputum microscopy, Montoux skin test, and chest x-ray, culture (NTLP, 2010).And Microscopy can be used for TB diagnosis except in priority (risk) groups like; HIV positive patients, children < 14 years, pregnant and breastfeeding mothers, health workers, contacts with drug resistant TB patients, retreatment cases, patients from prisons or refugee camps, diabetics(Health, 2016).

Several studies indicate that most drug regimens for co –TB and ART are based on rifampicin during the initial and continuation phase of TB treatment. The patient is put on an efavirenz-based ART regimen if it is started during TB treatment(NTLP., 2011). And examples of regimens include; AZT+3TC+EFV **or** AZT or d4T+3TC+NVP for adults and AZT+3TC+ABC for children.

1.2 Problem Statement.

Tuberculosis (TB) infection in HIV positive adults remains a global health problem, causing morbidity and mortality which has greatly lowered life expectancy, reduced agricultural outputs and increased food insecurity (Guwatudde et al., 2010). This is indicated by a high prevalence rate with around 1.2 million cases of tuberculosis amongst people who are HIV-positive and about 400,000 people who die of HIV-associated tuberculosis(WHO, 2015). In 2010, a higher estimate of 68% (22.9 million) were HIV cases yet it's greatest predisposing co-factor to TB and among this, 5% were adults cases despite control measures(G. WHO, 2011).

In Uganda, 2.3 million people are HIV infected (Weekly Observer, 2012). TB prevalence rate which made up to 79/100,000 and 54% were TB- HIV co-infected(WHO, 2013). However, Uganda as whole has set up programmer bodies (TASO, NTLP) which distribute free ARVs medications, Condoms, TB drugs and preventive services to its citizens(Madraa, 2012).

Despite the notable progress by government in providing free drugs, immunization policies in the last decades, tuberculosis is still a public health concern in most of the countries(WHO, 2014). The target by the SDGs to end the TB epidemic by 2030 is not yet achieved(G. T. WHO, 2015). Also the drawn plan to reduce TB prevalence for the period of 2016-2020 is not yet accomplished(WHO, 2014).However, no clear documented studies have been carried out to determine TB prevalence, integrating social-economic and environmental in Amuria health Centre IV which study would help health system put effective control measures and Amuria community.

1.3. Study Objective

1.3.1. Broad objective

To assess the prevalence and factors associated with Tuberculosis among HIV positive adults attending ART clinic in Amuria health Centre IV in Amuria district.

1.3.2. Specific objectives

1. To determine the prevalence of pulmonary tuberculosis among HIV positive adults attending ART clinic in Amuria health Centre IV in Amuria district.
2. To assess the social factors that predispose to the prevalence of tuberculosis among HIV positive adults attending ART clinic in Amuria health Centre IV in Amuria district.
3. To assess environmental factors associated with TB spread among HIV positive adults attending HIV clinic in Amuria health Centre IV in Amuria district.

1.4. Research questions

1. What is the prevalence of pulmonary tuberculosis among HIV positive adults attending ART clinic in Amuria health Centre IV in Amuria district?
2. What are the social factors that increase the prevalence of Tuberculosis among HIV positive adults attending ART clinic in Amuria health Centre IV in Amuria district?
3. What are the environmental factors associated with TB spread among HIV positive adults attending ART clinic in Amuria health Centre IV in Amuria district?

1.5. Significance

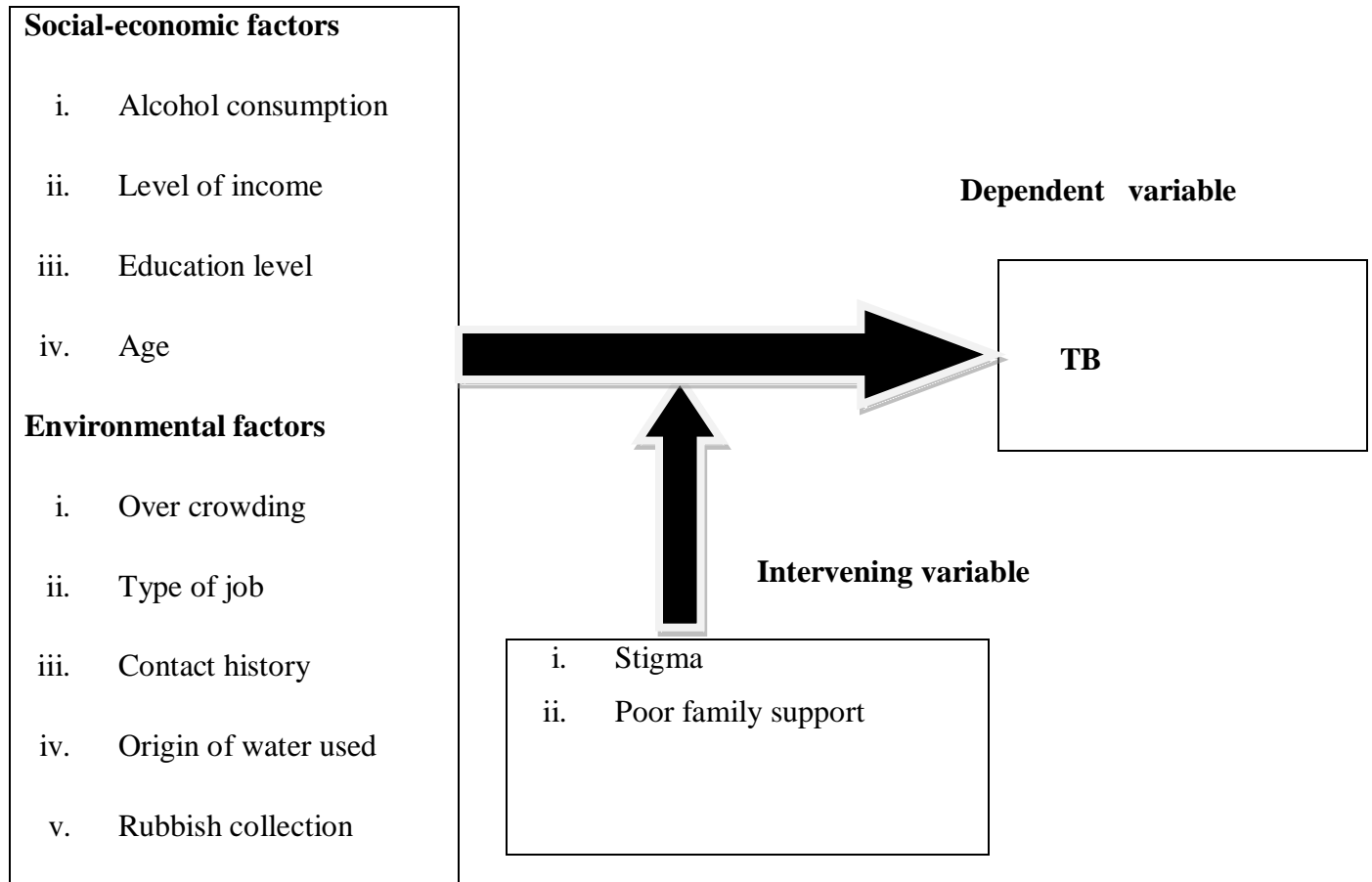
The results of this study will help the ministry of health and other health organizations to identify knowledge gaps on TB incidence and associated factors.

To academic body, findings will help Clinicians in the management of HIV patients. The results of this study will be used as reference point for future researches in the medical field. It will also encourage hospital administrators to strengthen health education programs in Amuria health Centre IV.

To the community, Study findings will serve as reference for health sub-district team when planning and for TB/HIV intervention activities.

1.6. Conceptual framework of TB prevalence and associated factors in HIV patients.

Independent variables



1.6.4. Scope of study

Content Scope.

The study described prevalence of TB among HIV patients who attended Amuria health Centre IV ART clinic, environmental risk factors and social factors on different HIV positive adults.

Geographical Scope

The study was conducted in ART clinic of Amuria health Centre IV, Amuria district and the participants were all HIV positive adults receiving ART who consented willingly to the study.

Time scope

This study was conducted between February to July 2017.

CHAPTER TWO

LITERATURE REVIEW.

2.0. Introduction

This chapter consists of literatures from the previous researchers about the same topic in relation to the specific objectives.

2.1.0 Prevalence of tuberculosis among HIV patients.

Studies across regions have consistently documented high TB prevalence in the first months of ART(Rajasekaran et al, 2009). According to world health organization report, the higher figure of 1.2 million old and new cases of tuberculosis amongst people who are HIV-positive should call attention for intervention (G. T. WHO, 2015). The substantial proportion of morbidity and mortality caused by TB is attributed to HIV co-infection(Getahun, 2010). The global annual prevalence TB report indicates that there 346 cases per 100,000 population and 11% of tested population are HIV positive(WHO, 2012) which increased with an estimate of 9 million cases of TB in 2013 with 13% co-infected with HIV(WHO, 2014) .In the following year, there were about 1.2 million cases of tuberculosis amongst people who are HIV-positive(G. T. WHO, 2015). The South African prevalence of pulmonary smear-positive TB was 234.2 per 100 000 in 2012, and varied from a high of 364.9 per 100 000 in the Northern Cape to a low of 120.5 per 100 000 in Limpopo Province (Soul, 2015).

In Uganda, 2.3 million people are HIV infected(Observer, 2012). It is stated as one of the 22 High Burden Countries with prevalence rate of 209 per 100,000 populations(G. WHO, 2011). World health organization found out that, the detection rate of TB cases which stagnated for years hid between 37% and 61%cases which signify a need to go back to the drawing board(G. WHO, 2011).

Another researcher found out that infection with tubercle bacilli most often spreads by inhalation of little air droplets containing the microbes and their source is usually a person with cavitary tuberculosis of the lungs (Pareek, 2013). Other studies observed that TB bacilli very often penetrate the respiratory system without causing any infection and susceptibility to infection and to development of active disease may depend, among others, on the age of the exposed person,

the genetic backgrounds, social status, eventual addictions, coexisting diseases, and their treatment (Yim J-J, 2010).

2.2.0 Social factors associated with TB among HIV adult patients.

According to Feng, the persons smoking cigarettes are more often infected with tubercle(Feng, 2014). More TB cases with history of smoking are males 18.3% than females 7.8% in more than 200 persons (Kalonji et al., 2016).Another researcher found out that the need to tackle the social determinants of TB has never been more urgent than today(Hargreaves, 2011). In developing countries prevalence of TB occurrence has been associated with factors like socio-economic (Lonnroth, 2008).Lifestyle/habit and TB/HIV co infection is significantly associated with marital status, alcohol intake (Mitku, 2016). Close contact with diseased individual, unemployment, homelessness and illicit drug use(Mohsin, 2011). A number of researchers found out that the social factors relate more to education(David et al, 2003), income, source of income, use of alcohol, addiction to alcohol, smoking, passive smoking, with alcohol abuse (40.3%) being the most associated with TB(Nathália França de Oliveira, 2013). High alcohol consumption (37.7% in 122 population) is associated with a three-fold risk of developing TB(Nathália França de Oliveira, 2013). Alcohol has a direct toxic effect on the immune system and the physical effects of alcohol abuse may impair the immune system. Excessive alcohol use is also associated with poor TB treatment adherence and a higher relapse rate(NTLP., 2011).

Other researchers found out that the most common addiction in HIV patients is smoking with 48.8% (Mohsin, 2011). Active and passive smoking is a risk factor for TB, independent alcohol use and other social factors. Active smoking is associated with recurrent TB and death due to TB disease.

2.3.0 Environmental Risk Factors among HIV positive adults.

Tuberculosis is a multi-factorial disease in which complex environmental interactions contribute to the overall disease and understanding the individual balance to degree of exposure has strong implications on tuberculosis control and prevention(Mohsin, 2011). TB is a disease more influenced by environmental factors (Laumbach RJ, 2012).They include; type of housing, persons per room “overcrowding”, rubbish collection, and origin of water used at home, staying with persons with chronic cough(having history of TB contact). According to other researchers,

the more concentrated and less airy household environments put people who inhabit them in close proximity (20.2% in population of 272 people), favoring the transmission of airborne diseases such as TB. History of TB contact holds a greater percentage i.e. 95 (38%) in population of 250 (Mohsin, 2011). However, other researchers found out that the factors influencing the infection rate after exposition include; density of infected air droplets in the atmosphere, the duration of exposition and the degree of virulence of the particular species of tubercle bacilli (Schwander, 2011). Other studies found out that Prison settings have the highest but neglected reservoirs for TB due to overcrowding, poor ventilation (Biadglegn, 2015). Therefore, overcrowding (≥ 3 persons/room) is a leading significant finding with 69.60% in 174 populations (Mohsin, 2011).

CHAPTER THREE:

METHODOLOGY

3.0. Introduction

This chapter contains a description of the method and procedure that was employed in conducting this study.

3.1 Study area

The study was carried out in Amuria health Centre IV in Amuria district, Uganda. Amuria health Centre IV is government hospital. Amuria district is located in the Eastern region of Uganda which predisposes dwellers to a number of risk factors, to TB transmission.

3.2 Study design

The across sectional study was used, that was descriptive in nature which enabled the researcher to study well the patients attending ART clinic with the help of questionnaire.

3.3 Study population

The study included all the HIV positive adults aged 18 and above attending ART clinic on designated ART days of Thursday and Friday according to the health Centre ART program who consented to participate in exercise.

3.4 Inclusion criteria.

All the HIV positive adult patients attending and receiving ART in Amuria health Centre IV and all new cases within two month of study were included and recorded. Any clinical suspicion of TB was screened by bacteriology (ZN staining and microscopy).

3.5 Exclusion criteria

All patients who declined to participate in the study.

3.6 Sample size determination

The sample size was determined by fisher's formula (1962)

$$n = \frac{z^2 pq}{d^2}$$

When n = designed sample size.

z= Standard deviation at the desired degree of accuracy which is 95% z= 1.96.

p=proportion of target population estimated to have similar characteristic .50 %(constant) or 0.5 is to be used therefore p=0.5 because of unknown incidence of which is being measured.

q=Standard 1.0 –p =0.5.

d=Degree of accuracy. 8.0 % will be used.

On substituting the above formula,

$$\frac{1.96^2 \times 0.5 \times 0.5}{0.08^2}$$

Hence, n = 150

3.7 Method of Data Collection

A self-administered Questionnaire was filled with pertinent information from the case notes and was screened with laboratory analysis.

3.8 Data analysis and presentation plan

The data collected was computed using Microsoft excel. The analysis was made in line with the study objectives so as to achieve the purpose of the study and was summarized inform of tables, pie-charts, and narratives depending on the data analyzed.

3.9 Data quality control

To ensure quality control, I conducted a one day training for the two research assistants who there-after did field testing of the study tools. A total of four questionnaires were distributed for the pre-test with my close supervision.

3.10 Ethical consideration.

Introductory letter was obtained from school of allied health sciences, KIU-WC, Consent was obtained from participants before interviewed, risks and benefits explained, plus confidentiality.

CHAPTER IV

STUDY FINDINGS

4.1. SOCIAL DEMOGRAPHIC CHARACTERISTICS

In this study a majority of the respondents Aged range 30-40 with 36%, followed by age group of 18 – 30 years (32.6) 41 – 50 with 16.67%, then 51-60 with 12% and least respondents, 4 (2.67%) were in the age groups of >60 years. Of the 150 respondents interviewed, 97(64.67%) were female and 53(35.3%) were males. A half the number of respondents (37.33%) were married, 49(32.67%) were single, 24 (16%) widowed and 15 (10%) had divorced, others were 4%. Among religion, most of respondents were christians(82.67%), then moslems with 10.67% and others 6,67%.

Majority of the respondents were peasants (46%) followed by business persons with 30%. 11.3% were civil servants, 7.3% were students, while others were 3%. The most affected group was 31-40 with 4.67% followed by 41-50 with 4%. Among gender (sex) group, males were more 11 (7.33%) than female 8(5.33%). As in marital status, more cases were identified in the married i.e. 8(5.33%), next was widowed, 5(3.33%), the divorced were 3(2%), then other 2(1.33%) and singles 1(0.67%). In religious beliefs, Christians were more 14(9.33%) than Muslims which were 3(2%), others were only 2(1.33%). Generally, the most affected among occupational basis was business persons with 11(7.33%) followed by peasants with 8(5.33%). Primary education level merged high with 12(8%), followed by secondary level 4(2.67), then tertiary 3(2%).

Table 1 : Socio-demographic characteristics of HIV patients attending art-clinic in Amuria health centre IV (Age, Sex, and Marital status and religion, education level, occupation distribution in the study

Variable	Frequency					Percentage
	Total	TB. Yes	%	TB. NO	%	
1. AGE						
18-30	49	04	2.67	46	30.67	32.67%
31 – 40	54	07	4.67	45	30	36%
41 – 50	25	06	4	19	12.67	16.67%
51 – 60	18	2	1.33	16	10.67	12%
60 and above	04	1	0.67	3	2	2.67%
TOTAL	150					100%
2. SEX						
Male	53	11	7.33	42	28	35.33%
Female	97	08	5.33	89	59.33	64.67%
TOTAL	150					100%
3. MARITAL STATUS						
Married	56	8	5.33	48	32	37.33%
Single	49	1	0.67	48	32	32.67%
Widowed	24	5	3.33	19	12.67	16%
Divorced	15	3	2	12	8	10%
Others	06	2	1.33	4	2.67	4%
TOTAL	150					100%
4. RELIGION						
Christians	124	14	9.33	110	73.33	82.67%
Moslems	16	3	2	13	8.67	10.67%
Others	10	2	1.33	8	5.33	6.67%
TOTAL	150					100%
5. Occupation						
Business	45	11	7.33	34	20	30%
Student	11	0	00	11	7.33	7.3%
Peasant	69	8	5.33	61	40.67	46%
Civil servants	17	0	00	17	11.33	11.33%
Others	8	0	00	8	5.33	5.3%
TOTAL	150					100%
6. education level						
Primary	78	12	8	66	44	52%
Secondary	45	4	2.67	41	27.33	30%
Tertiary	27	3	2	24	16	18%

4.2 The prevalence of TB among respondents in ART clinic of Amuria health center IV.

According to laboratory obtained in this study, 7.33% males were sputum positive and sputum positive females were 5.33% which totaled to 12.66% positive respondents.

Table 2: Table showing prevalence of TB among respondents

VARIABLE	FREQUENCY	PERCENTAGE
POSITIVE TB	19	12.66%
NEGATIVE TB	131	87.67%

4.3 Social factors associated with TB occurrence.

In this study, TB showed greater association statically with following social factors (table 4); smoking cigarettes (28%), then alcohol intake (18.67%), and unemployment (14%).

Among the several respondents who were asked about their exposure characteristics, 60.67% responded yes to asked questions and 39.33% replied no to the questions.

Table 3: Social factors associated with TB occurrence (n=150)

Social variable	Yes	%	No	%	frequency	Total percentage
Smoking cigarettes	42	28%	26	17.33%	51	45.33
Unemployment	21	14%	14	9.33%	29	23.33
Take other drugs e.g. alcohol	28	18.67%	19	12.67%	32	31.34
Total	91	60.67%	59	39.33 %	150	100 %

4.4 Environmental factors associated with TB transmission

After performing the interview, overcrowding showed highest percentage (16%), followed by non-permanent housing (15.33%) then living with chronic cough patients (11.33%.) However, a majority (18%) had rubbish pit (replied YES) and use borehole water (14%).

Table 4: Environmental factors associated with TB transmission (n=150)

• over crowding	frequency	Percentage (%)
Yes	24	16
No	06	04
• live with chronic cough patients(contact history)		
Yes	17	11.33
No	13	8.67
• origin of water used at home		
Borehole water	21	14
Others	09	06
• Having rubbish pit at home (rubbish collection)		
Yes	27	18
No	03	02
• Type of housing		
Non permanent	23	15.33
Permanent	07	4.67
Total	150	100%

CHAPTER V: DISCUSSION

5.1 Socio-demographic characteristics

Among the social demographic characteristics of participants, more males 11(7.33%) were affected than female 8(5.33%), this is similar with other studies by Olaniran O, 2011 which identified males 7 (58.3%) and 5 (41.7%) females. This may be due to the general attitude of males towards indiscriminate sex especially when they move away from their families to do

business. The educational level of most participants was low, as most (78, 52%) had attained only primary level education. This is similar to David et al. 2003 where most ((822, 72%) had attained only primary education. The age distribution reveals highest prevalence to be in the age 31- 40yrs (3.4%), which represent sexually active age group and correlates with work done by Olaniran et. al, 2011.

5.2 Prevalence of tuberculosis

This study investigated the prevalence of Tuberculosis among HIV/AIDS adults and out of 150 sputa samples examined microscopically with ZN staining, 19 were positive for acid fast bacilli giving prevalence rate of 12.66% which shows strong association between TB and HIV/AIDS in this area. This is similar to a research done in Obafemi Awolowo University Teaching Hospital Complex Oauthc, ILE –IFE where 12 (13%) were sputa positive for ZN staining and microscopy, WHO global TB report 11% per 1000 population and was different from a study carried out by soul city research unit, 2015 in south Africa which was 234.2 per 100 000 in 2012, 364.9 per 100 000 in the Northern Cape and 120.5 per 100 000 in Limpopo Province because of may be large sample size there and level of education . Male were more affected i.e.11 (7.33%) versus 8(5.33%), although no significant difference was highlighted.

5.3 Social factors associated with TB occurrence

Among the social factors related to TB-HIV co-infected cases, I assessed the association of TB in HIV individuals being related to smoking (28%), alcohol use (18.67%), this is in line with other studies (Mohsin, 2011, Nathália, 2013. Alcohol intake took 40.3% population) that showed strong association between TB and Smoking, alcoholism, which is understandable because cachexia due to alcoholism predisposes individuals to low immunity and smoking destroys lung parenchyma giving chance for tubercle invasion.

5.4 Environmental Factors among HIV positive adults

Among environmental factors related to co-infection, an association was over crowding 16%, this was similar to a research done by Mohsin et al. 2011(out of 272 people, 20.2% had overcrowding). This is very true because the density of infected air droplets in the atmosphere, the duration of exposition and the degree of virulence of the particular species of tubercle bacilli increases with population according to Schwander, 2011. Others identified factors included non-permanent housing (15.33%) then living with chronic cough patients (11.33%).

5.5 Strength and weak weakness

Despite the fact that sputa collected was not the best early morning sputum; however the dependent variable was captured. Bias might affect accuracy of the information related to some risk factors; even though the data were collected using of a structured questionnaire, one cannot discount the existence of social desirability therefore, it may limit the generalizability of results.

5.6 Conclusion

The study identified marital status, Type of occupation, age (between 31-50), and low education level as the higher socio-demographic factors. Smoking status, alcohol intake, and overcrowding, unemployment, poor housing, poor hygiene and Cases that had a history of contact with a known tuberculosis patient were associated with TB/HIV co-infection adults. In general, clinical TB disease, smoking, overcrowding and alcohol consumption were found to be the main predictors for TB/HIV co-infection.

5.7 Recommendations

- Amuria health center facility should put more emphasis on TB detection and immediate initiation of ant TB treatment of all cases detected
- Positive HIV adults should be provided with health education on opportunistic infections like tuberculosis in every health facility and in the community by health professionals.
- The government should focus on improving the educational status of the community as it would greatly helpful in decreasing the emergence of active tuberculosis in HIV patients.
- Smear-positive TB patients are responsible for TB transmission, therefore the MOH, stakeholders should avail equipment's for TB diagnosis in all health facilities.
- Further studies not included in this study should be carried out in other parts of district including other small health centers to create awareness TB.

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APPENDIX 1: QUESTIONNAIRE

Informed Consent

My name is Ekemu William, a student of Kampala International University western campus , school of allied health (DCM). I am here to do a study on incidence and factors associated with tuberculosis among HIV positive adults which will help us determine its magnitude and alert concern authorities to act accordingly. So may you allow me?

Demographic DATA

Code No.

Location... (e.g. HIV Clinic.)

Age:..... Sex:

Tribe

Religion

Marital status.....

Village/.....

District of Residence:

Occupation

Education level

Sub county:.....

Date of TB Assessment:

Prevalence

1. Have you been coughing for 2 weeks or more? Yes ☐ No ☐
2. If yes, is it blood stained sputum? Yes ☐ No ☐
3. Do you have persistent fevers? Yes ☐ No ☐
4. Laboratory results with ZN microscopy. Positive ☐ negative ☐ **NB: To be filled last from the laboratory.**
5. If yes, for how long? 3 days ☐ more than 3 days ☐ for a week ☐
6. Do you sweat at night? Yes ☐ ☐

Social factors associated with TB occurrence

7. Do you smoke cigarettes? Yes ☐ No ☐
8. Where do you work to get money? Employed ☐ unemployed ☐.
9. Do you take any other drug (alcohol)? Yes ☐ No ☐

Environmental factors associated with TB occurrence

10. Do who live with a person/relative with chronic cough? Yes ☐ No ☐
11. Which type of house do you stay in? Block ☐ semi-permanent ☐ permanent ☐
12. How many are you in a house /room (crowding)? Two ☐ 3 and above ☐
13. Does your home have rubbish pit/dust bin? Yes ☐ No ☐
14. Where is origin of water you use at home? Bore hole ☐ Others ☐

APPENDIX 3: MAP OF UGANDA

MAP OF UGANDA SHOWING DISTRICTS AND NEIGHBOURING COUNTRIES.

