FACTORS CONTRIBUTING TO THE HIGH PREVALENCE OF MALARIA AMONG HIV PATIENTS ATTENDING HIV CLINIC AT KYAMUHUNGA HEALTH CENTRE III IN BUSHENYI DISTRICT

BY

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ABSTRACT

Background of the study:

Malaria remains the single main cause of ill-health and death among HIV/AIDS patients in resource poor countries worldwide. Malaria still remains a challenging infection affecting the lives of several HIV infected persons in Uganda.

Problem statement:

Statistics from the Ministry of Health (2016) show that malaria is still the leading cause of death in Uganda, accounting for over 27% of deaths. Malaria prevalence in HIV+ positive patients in Kyamuhunga Health Centre III is thought to be at 7.8% of the HIV+ patients attending the clinic on a daily basis.

Main objective:

This study therefore aimed at assessing the factors contributing to the high prevalence of malaria among HIV patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

Methodology:

The study covered a sample of eighty (80) respondents to gather primary data. Simple random sampling method was used to gather responses among patients. Questionnaires and an interview guide were used as data collection tools.

Results:

Results indicated that majority of the participants were female patients and malaria was dominant among HIV Positive patients aged 38-47 years. It was noted that the odds of having malaria also increased among patients with lower levels of education. It was also noted that more odds of having malaria were found among majority patients who were farmers and unemployed participants. Malaria infection was acquired with repeated exposure to malaria parasites especially for patients who did not use Treated mosquito nets. It is noted that HIV+ patients with malaria greatly acquired unbalanced immunity with relative low CD4* cell count and unbalanced haemoglobin levels,

greatly affected with body pain and weakness, fever, headache and variety issues of vomiting. Paracetamol, use of treated mosquito nets, clinical examination and patient follow-up were shown to provide a beneficial effect in preventing malaria infection among in HIV positive patients. Conclusion: Malaria infection was acquired with repeated exposure to malaria parasites especially for patients who did not use Treated mosquito nets which increased the susceptibility for new malaria infections among HIV positive patients.

Recommendations:

The researcher therefore commends that a comprehensive health education, antiretroviral therapy and malaria preventive materials such as insecticide-treated bed nets should be provided to reduce the prevalence of malaria among HIV Positive patients.

AUTHOR'S DECLARATION

I Kakuru James declare that this report assessing factors contributing to the high prevalence of malaria among HIV patients attending HIV clinic at Kyamuhunga health Centre III in Bushenyi District is mine and has never been presented for any award in KIU or any other institution of higher learning.

Signature…….date……./……./……..

KAKURU JAMES

AUTHORIZATION FOR THE STUDY

Research report submitted to Uganda Nurses and mid wife examination board and deposited in the library, is open for inspection, but is to be used with due regard to the rights of the author. The author and Kampala International University School of Nursing can grant privilege of purchase of copy.

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SUPERVISORS' APPROVAL

This research report assessing factors contributing to the high prevalence of malaria among HIV Patients attending HIV Clinic at Kyamuhunga health Centre III in Bushenyi District has been compiled under my supervision and is now ready for presentation with my approval.

Signature……..... date…….....

MR. TURYASINGURA JOHNAN

RCN: BS-N

Signature……..... date…….....

MRS. KABANYORO ANNET

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DEDICATION

I dedicate this piece of work to Abikiza Africano who has been my advisor in all academic areas concerning my course.

ACKNOWLEDGEMENT

Above all, I thank the Almighty God for the knowledge, wisdom, courage, health and determination He has given me.

My sincere appreciation goes to my academic supervisor Turyasingura Johnan for the supportive criticism and guidance throughout the research process. This encouragement has enabled me to produce quality work.

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DEFINATION OF KEY TERMS

Malaria is a serious and sometimes fatal disease caused by a parasite called genus Plasmodium that commonly infects a certain type of mosquito which feeds on humans. People who get **malaria** are typically very sick with high fevers, shaking chills, and flu-like illness.

HIV is a virus that attacks the immune system, which is our body's natural defence against illness. The virus destroys a type of white blood cell in the immune system called a T-helper cell, and makes copies of it inside these cells. T-helper cells are also referred to as CD4 cells.

Prevalence; The *word prevalence* comes from the Latin praevalere, *meaning* "condition of being widespread or general." The *word* is often used to describe a phenomenon that is widespread in a community, like the *prevalence* of a disease across a country. *Prevalence* is another *word* for "commonness".

Blood is the red liquid that circulates in the arteries and veins of humans carrying oxygen to and carbon dioxide from the tissues of the body.

CD4; in molecular biology, **CD4** (cluster of differentiation 4) is a glycoprotein found on the surface of immune cells such as T helper cells, monocytes, macrophages, and dendritic cells.

Treatment is the administration or application of remedies to a patient or for a disease or an injury; medicinal or surgical management; therapy.

Parasiteamia is a condition in which parasites are present in the blood used especially to indicate the presence of parasites without clinical symptoms.

LIST OF ACRONYMS

AIDS	Acquire Immunodeficiency syndrome
ANC	Antenatal Care
ART	Antiretroviral therapy
CD4	T–lymphocyte cell bearing CD4 receptor
DNA	Deoxyribonucleic acid
HIV	Human immunodeficiency virus
ITNs	Insecticide Treated nets
RNA	Ribonucleic Acid
WHO	World Health Organisation

CHAPTER ONE

1.0 Introduction

This chapter presents the background of the study, problem statement, and objectives of the study, justification of the study and significance of the study.

1.1 Background of the study.

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. It is a parasitic infection that attacks a person's red blood cells (WHO, 2015). Malaria is one of the leading causes of death worldwide, especially in the developing world among young children and pregnant women (WHO, 2015). It is estimated that 500 million clinical cases and about 3 million deaths occur every year due to malaria, 90% of such deaths occurring in Sub-Saharan Africa (Amuta et.al, 2012). Infection of HIV and malaria are among the two most important global health problems of developing countries (Jegede et.al, 2017). Malaria is a protozoan disease caused by parasites called genus Plasmodium. It is the leading cause of death in children under the age of 5 years and pregnant women in developing countries (Asmamaw et.al, 2013). HIV/AIDS is also one of the most destructive epidemics the world has ever witnessed (Alemu et.al, 2013). HIV stands for the human immunodeficiency virus; it is a virus that attacks the immune system, the body's natural defense system. Without a strong immune system, the body has trouble fighting off disease (WHO, 2015).

Malaria and Human immunodeficiency virus (HIV) infections are major public health problems in many parts of the world. Both infections kill millions of people each year

with disproportionate heavy burden on Africa, India, Southeast Asia and South America (Tay et al, 2015). Because of the high prevalence of HIV and malaria in sub-Saharan Africa, co-infections are common. Notwithstanding the public huge health burden presented by these two infections, their interaction is still not completely understood (Asante et.al, 2011).

The geographic overlap between HIV-1 infection and malaria, show that particularly in eastern and southern Africa, has caused concern since the 1980s. The degree of interaction between HIV-1 infection and malaria emerged during 1999–2009 and has been extensively reviewed for both nonpregnant and pregnant adult women (Chalwe et.al, 2009). As the number of malaria and HIV co-infection increased, it has become apparent that anti-retroviral drugs interact with the few anti-malaria drugs in use, complicating treatment efforts for both infections (Sentinel Survey Report, 2009). Malaria and HIV co-infection also result in interactions that adversely affect the outcome of both conditions, especially among pregnant women and infants born to HIV infected mothers (Abu-Raddad et.al, 2016).

Malaria remains the single main cause of ill-health and death among HIV/AIDS patients in resource poor countries. Available research findings suggest that both human immunodeficiency virus (HIV) and malaria parasite infection act synergistically resulting in worse health outcomes (Jegede et.al, 2017). Malaria still remains a challenging infection affecting the lives of several HIV infected pregnant women in Uganda (Rubaihayo et.al, 2015). “Despite being preventable, malaria is one of the primary causes of death in Uganda. The 2014 Malaria Indicator Survey may

have shown a reduction in the prevalence rate (42%-19%), but the outlook based on reports from hospitals countrywide remains grim (Malaria Survey Report, 2014).

Malaria lowers the quality of life of HIV infected persons, speeds up the rate of progression to fully blown AIDS, reduces patients' response to antiretroviral treatment especially when co-infected with tuberculosis, increases stigma and limits one's ability to work and are usually associated with high medical care costs (Rubaihayo et.al, 2015).

1.2 Problem statement

Statistics from the Ministry of Health (2016) show that malaria is still the leading cause of death in Uganda, accounting for over 27% of deaths. Between 25 and 40% of outpatient visits at health facilities in the country are for malaria. For Ugandan children, pregnant women, the elderly and HIV-positive individuals, malaria is the primary cause of death (MOH, 2015). Further to this, a number of researchers have reported negative effect of malaria on HIV+ patients (Bretlinger et.al, 2011). Malaria contributes to a temporary increase in viral load among HIV-infected people which may worsen clinical disease and increase mother-to-child transmission and transmission in adults (Agwu, et.al, 2015). Upon examining patients' register books at Kyamuhunga Health Centre III, 7.8% of HIV+ patients who attend the clinic on a daily basis are co-infected with malaria (Joram and Agwu, 2015), however, there is a dearth of information on the collective impact of HIV-malaria co-infection on the hemoglobin levels in the general population (Tay et.al, 2015). Although malaria and HIV are major causes of morbidity and mortality in Uganda, the burden of malaria-HIV co-infection in Bushenyi District is not well documented. The researcher

therefore, is interested in studying the factors contributing to the prevalence of malaria among HIV+ patients in Kyamuhunga Health Centre III in Bushenyi District and determining approaches to treat and prevent the prevalence of malaria among HIV+ patients.

1.3 Objectives of the study

1.3.1 Purpose of the study

To assess the factors contributing to the high prevalence of malaria among HIV patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

1.3.2 Specific objectives of the study

i. To examine the factors associated with malaria infections in HIV+ Positive patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.
ii. To find out the effect of malaria on HIV+ patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.
iii. To assess the treatment and prevention measures that can be put in place to control the prevalence of malaria among HIV+ Patients.

1.3.3 Research questions

i. What factors are associated with malaria infections in HIV Positive patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.
ii. What is the effect of malaria on HIV+ patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District?

iii. What treatment and prevention measures have been put in place to control the prevalence of malaria among HIV+ Patients?

1.4 Justification of the study

Previous epidemiological and biomedical studies conducted tended to be characterized by a single disease approach. However, HIV-infected patients who are already faced with poverty, discrimination, and other forms of violence in rural areas remain an understudied group. Accordingly, the burden of malaria-HIV co-infection in Bushenyi District is not well documented yet HIV Positive patients are at heightened risk of malaria, and various infectious diseases (Houmsou et.al, 2014). Therefore, this study focused on establishing the factors contributing to the prevalence of malaria among HIV patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

1.5 Significance of the study

The study will reveal the prevalence of Malaria among HIV+Positive Patients and suggest possible measures to manage these diseases in Kyamuhunga Sub-County and Uganda at large.

This study will act as an insight to the health workers, patients and the Government to identify factors contributing to the prevalence of malaria among HIV-Positive patients and possible control mechanisms to manage the diseases.

In addition, the study will be a source of reference for future researchers as it serves to add on the existing literature.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter presents relevant literature from other scholars in relation to the study objectives.

2.1 The factors associated with malaria infections in HIV Positive patients

The interactions of malaria parasites and HIV are serious health challenges as it causes complications including severity of clinical signs and other symptoms (Kublin et.al, 2015). There are high rates of maternal morbidity including fever, severe anaemia, abortion, still birth, and placental malaria among these women (Johnbull, et.al, 2014). According to Meidani et.al (2012) about half (49.83%) of the study population, had Plasmodium falciparum positive slides at the time of recruitment; over one third reported having fever and one quarter of the women examined had a temperature ≥ 37.5°C. A significantly higher proportion of women with body temperatures ≥ 37.5°C had detectable malaria parasitaemia compared with 36.8% with negative slides. Anaemia was significantly associated with the presence of malaria parasites as 76.35% of pregnant women who have positive slides have haemoglobin levels <10 g/dl. Likewise, more pregnant women who reported having fever (74.76%) had malaria parasites. Furthermore, more of those who were on ART therapy (52.97%) had malaria parasites. A higher proportion of pregnant women whose CD4 was above 350 cells/mm3 had negative parasitaemia. Also, more of those who were multiparous presented with malaria parasites (Meidani et.al, 2012).

Johnbull et.al, (2014) noted that the prevalence of malaria among HIV-positive pregnant women and the odds of having malaria doubled with living in a rural

community. A number of risk factors were associated with malaria infection. Age was an important risk factor; women aged 26-30years and >30years had reduced odds of having malaria. The odds of having malaria infection doubled when moving from urban to rural settlements. Likewise, a high body temperature (>37.5°C) significantly increased the odds of having malaria infection by 90%. Pregnant women on ART therapy had an increased odds ratio of having malaria parasites. Malaria parasites were unlikely to be seen in those with normal haemoglobin levels (>10 g/dl). Pregnant women who had not recently been treated for an acute malaria attack were about nine times more likely to have presence of malaria parasites in blood than those treated recently. Illiteracy or no education was a contributory factor as this group had the highest mean malaria density (ibid, 2014).

HIV-infected patients are at higher risk of opportunistic infections including malaria because of their weakened immune systems (Mouala, 2013). Ojurongbe et.al, (2014) notes that highest prevalence of malaria parasitaemia was observed among HIV-positive group that had the higher CD4+ T-cells count. The reduction of $CD4^+$ T-cells at late stages of HIV infection results in decreased $CD8^+$ T-cells counts and function, thereby causing a severe change in the immune response against other agents of disease including *Plasmodium* (Andreani et.al, 2012). Parasitemia is more common among HIV-infected patients, as lower $CD4^+$ counts are associated with higher parasite densities (Andreani et.al, 2012).

Pregnant women transiently lose some of their acquired immunity due to the relative immunosuppression of pregnancy. Pregnant women who are not on treatment before coming to the hospital ANC are about nine times more likely to have malaria parasites.

The prevalence of malaria in HIV-positive pregnant women was influenced by the locality, level of haemoglobin and self-medication prior to coming to the hospital. Low haemoglobin, which serves as an index of malnutrition, was also a serious factor that should be evaluated to reduce the scourge and burden of malaria complications, and programs geared towards provision of mosquito and environmental barriers should be improved (Johnbull et.al, 2014).

Immunity to malaria is characterized by an age-related reduction in parasite burden, clinical symptoms, and prevalence of severe disease in individuals residing in an endemic area. P. falciparum infection and the burden of parasitemia are often less severe in older adults than in children. Children are at increased risk since they have not yet acquired natural immunity; The degree of immunity is also related to transmission intensity, which varies geographically. HIV-related immune-suppression diminishes this acquired immunity (Mouala, 2013).

World Health Organization (2017) also suggest that antimalarial treatment failure may be more common in HIV-infected adults with low CD4-cell counts compared to those not infected with HIV. Additional research is needed to investigate the impact of malaria on the natural history of HIV, potential therapeutic implications, interactions at a cellular and molecular level, and drug interactions between antiretroviral and antimalarial medicines (WHO, 2017).

However, other factors of HIV disease progression and transmission are strongly associated with blood viral burden. An increased concentration of human immunodeficiency virus type-1 (HIV-1) has been observed in the blood of men in Malawi relative to men in the USA and Europe, independent of CD4+ cell count.

Although the problem is multi factorial, high levels of viral replication and blood viral burden could provide one explanation for the scope and magnitude of the HIV epidemic in sub-Saharan Africa. So, high concentrations of HIV-1 RNA in the blood are predictive of disease progression, and correlate with the risk of blood-borne, vertical, and sexual transmission of the virus. Accordingly, understanding the factor(s) that increase the HIV viral burden is critical to patient management and efforts towards HIV prevention (Alemu et.al, 2013).

Very few studies have examined the factors contributing to the high prevalence of malaria among HIV patients attending HIV Clinic in Uganda. Therefore, this study is intended to determine the prevalence of malaria among HIV-positive patients in Bushenyi District.

2.2 The effect of malaria on HIV+ patients

Akinbo et.al, (2009) noted that HIV infection was a risk factor for acquiring malaria infection. HIV-infected patients are at higher risk for malaria because of their weakened immune systems.

Malaria disease kills millions of HIV+ patients yearly, and is the scourge of developing nations. Given the overlap of their geographic distribution and resultant rates of co-infection, interactions between the two diseases pose major public health problems. These diseases together accounted for over 3 million deaths in 2007, and millions more are adversely affected each year (WHO, 2015).

As the number of malaria and HIV co-infection increased, it has become apparent that anti-retroviral drugs interact with the few anti-malaria drugs in use, complicating

treatment efforts for both infections. Malaria and HIV co-infection also result in interactions that adversely affect the outcome of both conditions, especially among pregnant women and infants born to HIV infected mothers. Malaria and HIV individually are known to cause maternal anemia (Tay et.al, 2015). Malaria is known to cause an increase in transitory viral load while HIV causes more clinical malaria, higher parasitemia and higher rates of treatment failure in co-infected patients (Abu-Raddad et.al, 2016).

People living with HIV/AIDS are at increased risk of clinical malaria and severe illness, and HIV infection can decrease the protection offered by antimalarial treatment. Malaria contributes to a temporary increase in viral load among HIV-infected people which may worsen clinical disease and increase mother-to-child transmission (Amuta et.al, 2012).

Anaemia is one of the complications in both malaria and HIV infections and contributes to its morbidity and mortality. Tay et.al, (2014) noted that HIV patients with anemia were mild to moderate anemia. This is in agreement with studies by Meidani et.al, (2012) where mild to moderate anemia was observed in majority of HIV patients with malaria in their studies. It was revealed that almost all the patients with malaria infection were anemic. This may be due to the clearance and or destruction of infected RBCs, the clearance of uninfected RBCs, erythropoietic suppression and dyserythropoiesis.

Malaria is an important cause of disease in HIV-infected adults wherever the two infections coexist. The impact of malaria on HIV-1 is less clear. Efficient reverse transcription and integration of the HIV genome into the host DNA does not occur

until the immune cells are activated. Because malaria infection is associated with strong CD4+ cell activation and up-regulation of proinflammatory cytokines, it provides an ideal microenvironment for the spread of the virus among the CD4+ cells and thus for rapid HIV-1 replication. This has been described for malaria in an in vitro model. In vivo, HIV-1 viral load first increases in malaria infected patients and then partially decreases 4 weeks after anti-malaria treatment (Alemu, et.al, 2013).

In Children with cerebral or uncomplicated malaria, the frequency and absolute number of peripheral T cells was also lower than normal and the degree of disease induced T cell outflow from the peripheral blood was correlated with disease severity. Studies have reported lower total leukocyte and lymphocyte counts but a high number of activated cells in malaria patients with a distinct pattern observed between *P. falciparum* and *P. vivax* infections. Furthermore, in studies done in children aged 3–6 years who were infected with *P. falciparum*, lower CD4+ and CD8+ cell counts were observed in those with acute malaria when compared with children with no parasitemia or in those with asymptomatic parasitemia (Alemu, et.al, 2013).

Malaria and HIV are two of the most important infectious diseases, which affect millions of people across overlapping geographic distributions. Malaria infection is associated with strong CD4+ cell activation and up-regulation of proinflammatory cytokines and it provides an ideal microenvironment for the spread of the virus among the CD4+ cells and for rapid HIV-1 replication. Additionally, malaria increases blood viral burden by different mechanisms. Therefore, high concentrations of HIV-1 RNA in the blood are predictive of disease progression, and correlate with the risk of blood-borne, vertical, and sexual transmission of the virus (Jegede et.al, 2017).

High parasite density is likely to elicit strong immune activation, leading to a high turnover of HIV-1 RNA. Fever indicates a cytokine response that might increase concentrations of HIV-1 RNA. The modest increase in HIV-1 RNA concentration among people with lower CD4+ counts and higher concentrations HIV-1 RNA at baseline might indicate poor CD4+ cell function, which restricts the otherwise normal response to the cytokine stimuli of malaria, leading to a reduced increase in HIV-1 RNA turnover (Alemu, et.al, 2013).

2.3 The treatment and prevention measures that can be put in place to control the prevalence of malaria among HIV+ Patients

To achieve better management of all HIV patients, malaria prevention through cotrimoxazole chemotherapy, and use of treated bed nets are useful strategy. Diagnosing malaria, prompt antiretroviral therapy, monitoring CD4 count and some hematology indices on regular basis is critical (Feyisayo et.al, 2017).

The Uganda Malaria Reduction Strategic Plan (UMRSP) provides a common framework for all stakeholders to accelerate nationwide scale up of evidenced-led malaria reduction interventions by the government. The government waived import taxes and tariffs on mosquito nets and netting materials to promote use. Despite the concerted efforts to increase ITN coverage, the volume of nets remained too low to achieve 60% coverage of vulnerable groups. Following the debates on the optimal model for the delivery of ITN, a "mixed sector model" was finally adopted with a stronger emphasis on public sector delivery without complicated voucher schemes and mass free distribution campaigns were recommended (MOH, 2014).

Increases in HIV-1 RNA related to malaria might be mediated through a series of immunological mechanisms. *P*. *falciparum* infection might promote macrophages and CD4+ cells to activate viral transcription. These mechanisms could explain the differences observed between the groups classified according to parasitaemia, fever, and CD4+ count in some studies. Therefore, knowing of interaction between malaria and HIV are important for management or control of these diseases (Jegede et.al, 2017).

Medical and chemical approaches can become ineffective through development of resistance by mosquito vectors to chemicals and by parasites to pharmaceuticals. An alternative for reducing the incidence of malaria lies in the development of integrated strategies systematically based on social and ecological approaches. Pestizid (2010) sets out the importance of analysing a specific situation in order to develop a holistic strategy of interventions which will be appropriate to the vectors and the local conditions. The strategies proposed recognize the importance of community participation, health education, surveillance, improving public health systems, decentralization of malaria control implementation, local capacity building, income generation, involvement of civil society organisations, support of local research, intersectoral and regional cooperation (Pestizid, 2010).

The Current malaria interventions have substantially reduced malaria disease incidence across the continent, therefore, increasing access to these interventions, and maintaining their effectiveness in the face of insecticide and drug resistance, should form a cornerstone of post-control strategies.

According to recent WHO guidelines, the confirmation of diagnosis by microscopy (malaria blood smear, MBS) or rapid diagnostic tests (RDTs) is recommended for all patients with suspected malaria before treatment is initiated, but presumptive treatment is still a common practice in malaria-endemic resource-limited settings. The WHO (2017) adds that consideration must be given to possible drug-drug interactions in co-infected patients receiving malaria treatment or preventive therapy and antiretroviral or prophylactic medicines for HIV-infection. Treatment or intermittent preventive treatment with sulfadoxine-pyrimethamine should not be given to HIV-infected patients receiving cotrimoxazole (trimethoprim plus sulfamethoxazole) prophylaxis as this increases the risk of sulfonamide-induced adverse drug reactions. Treatment in HIV-infected patients on zidovudine or efavirenz should, if possible, avoid amodiaquine-containing ACT regimens, as this increases the risk of neutropenia and hepatotoxicity (WHO, 2017).

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter presents the approaches and methods that were used in conducting a study to assess the factors contributing to the prevalence of malaria among HIV patients

attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District. It details the research design and rationale, study setting rationale, study population, sample size determination, sample selection and laboratory procedure, selection criteria of participants, research instruments, research procedure, data management, ethical considerations, limitations of the study and dissemination of results.

3.1 Research design and rationale

This study was a cross-sectional, descriptive study designed to investigate malaria prevalence among HIV+ patients. This research design was chosen because it helped the researcher to study the phenomenon among different respondents at a single point in time. The design was selected because it was a method of investigation in which data was got from selected blood samples whose response representation respectively gave a clue to the views of the population.

3.2 Study setting and Rationale

The study was conducted at Kyamuhunga Health Centre III in Bushenyi District. Bushenyi district in South Western Uganda is bordered by Kasese District to the north, Kamwenge District and Ibanda District to the northeast, Mbarara District to the east and the south-east, Ntungamo District to the south, Rukungiri District to the southwest and the Democratic Republic of the Congo to the west. The district is made up of twelve sub counties of Bushenyi D, Bitooma, Ibaare, Bushenyi E, Bushenyi C, Kyabugimbi, Bushenyi A, Kyeizooba, and Ruhumuro, together with Central Division, parish in Kyamuhunga Sub-county. Bushenyi lies between 00N and 0046’S of equator and 29041//E and 30030’ east of Greenwich. It has: a population of 738,355, (51.7%

are females and 48.3% are males); an altitude of 2400-3660 feet above sea level and mean annual maximum temperature is 22.5-300C. Bushenyi district was selected because malaria was one of diseases that were still leading cause of health problems in the area (Atai, 2014).

3.3 Study Population

Patients diagnosed with HIV/AIDS infection and seeking treatment at the HIV Clinic at Kyamuhunga Health Centre III were the source population for the study. The study enrolled HIV patients aged 18 years and above.

3.3.1 Sample Size determination

Sample size was determined using the binomial model to estimate the confidence interval (CI). The HIV prevalence in the Bushenyi district is known to be less than 25% so the malaria prevalence in the area which is higher is used to estimate the minimum sample size needed to achieve enough statistical power. Malaria prevalence in HIV+ positive patients in Kyamuhunga Health Centre III was thought to be at 7.8% of the HIV+ patients attending the clinic on a daily basis (Joram and Agwu, 2015). The sample size was calculated with a 95% and precision level of 5%:

$$n_o = \frac{Z_a P q}{d^2}$$

In the equation below, *n* is the sample size, *z* is the critical value of the standard normal distribution at the 5% level (1.96), p is the estimated malaria prevalence in HIV + patients (0.78), $q = 1 - p$, and *d* is the precision level. The sample size of 80 respondents was covered for the study.

$$n_o = \frac{Z_a P q}{d^2}$$

n= $\frac{0.05 \times 0.78}{(1-0.78)2}$

n= $\frac{0.039}{0.0484}$ n= 80 Respondents.

3.4.0 Definition of study variables

3.4.1 Dependent variable

Prevalence of Malaria is a dependent variable; **Malaria** is a serious and sometimes fatal disease caused by a parasite called genus Plasmodium that commonly infects a certain type of mosquito which feeds on humans. People who get malaria are typically very sick with high fevers, shaking chills, and flu-like illness.

3.4.2 Independent variable

HIV is an independent variable; **HIV** is a virus that attacks the immune system, which is our body's natural defense against illness. The virus destroys a type of white blood cell in the immune system called a T-helper cell, and makes copies of itself inside these cells. T-helper cells are also referred to as CD4 cells.

3.5 Sampling procedure and rationale

HIV positive participants (females and males) aged between 18 and above years were randomly sampled for the study. Simple random sampling method was used to targeted

respondents. This was achieved by making members count 1 2 and those that counted 2 were enrolled to the study until a total desired number was achieved.

3.6 Selection criteria of participants

3.6.1 Inclusion criteria

The study included HIV infected male and female adult patients aged 18 years and above receiving HIV care and treatment services at Kyamuhunga Health Centre III. These patients were duly registered into the HIV care and treatment program in the hospital and had willful consent by signing consent forms to participate in the study.

3.6.2 Exclusion criteria

Patients who did not consent to participate in the study were not interfered with irrespective of their routine care at the hospital.

3.7 Research Instruments

Questionnaires were administered to patients who were present at Kyamuhunga Health Centre III. Gloves, prickers, and slides were used to get blood samples to test for malaria parasites while vacationers and syringes were used to get blood samples to test for HB level and CD4 count. An interview guide was also used among eligible patients who were not willing to fill in the questionnaires.

3.8 Data collection procedure

An approval letter from the research supervisor and the Uganda Nurses and Midwives Examination Board was secured to grant the researcher permission to collect data. The

researcher introduced this letter to the clinical officers who informed the patients of the presence of the researcher and the intended aim of his presence. Patients were given a consent form for which they were explained the benefits of participating in the study. The patients were informed that the study was voluntary and whoever was not willing to participant would be excused.

3.9 Data management

Editing: This involved checking the questionnaire for completeness and improperly filled questionnaires sorted. Complete filled questionnaires were kept in the cupboard for safety and confidentiality and were later taken for analysis.

Quality: Quality was maintained through aseptic sample collection, processing and analysis using standard parasitology methods. The quality of samples used was only non-haemolysed blood samples. Positive and negative controls were used to test the functionality of each batch of malaria test strips before being used for malaria testing.

Coding: Data collection and analysis was done using up-to-date statistical packages. All questions in the questionnaire were coded for easy analysis.

Data analysis: Data was exported to SPSS windows version 16.0 for analysis and Microsoft excel program and was presented in form of graphs, tables and pie-charts for easy interpretation.

3.10 Ethical considerations

An approval letter from School of Nursing Kampala International University granted the researcher permission to collect data.

Also permission was sought from the clinic officer before starting the study.

The participants were explained about the study. The explanation was limited to the benefits of the results and responsibilities of the participants in the study.

Confidentiality was ensured using identification codes not names and only the responses were availed in the results.

3.11 Limitations of the study

It required a lot of costs especially on printing, photocopying and transport. This however was solved by soliciting for funds from friends and family relatives to finance the study.

The research work was conducted while at the same time attending to other class works and this limited time to prioritize the study; however this was overcome through proper allocation and utilization of time available and the researcher managed to cover 75% of the targeted respondents.

3.12 Dissemination of Results

Copies of the study findings were produced and given to the clinical officers and the Examination Board for the award of Diploma in Nursing, Kampala International University School of Nursing-western campus library for future reference.

CHAPTER FOUR: RESULTS

4.0 Description of the sample

A total of 80 HIV infected patients were recruited during the study period to assess the factors contributing to the high prevalence of malaria among HIV patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

4.1 Demographic characteristics of the respondents

The demographic characteristics of respondents included, gender, age, marital status, educational level, and occupation; the results according to the analysis are presented as shown in table 1 below and 2 below on page 22.

Table 1: Background information of respondents (N=80)

Variables	**Frequency**	**Percentage (%)**
Gender of respondents		
Male	36	45
Female	44	55
Total	**80**	**100**
Age range		
18-27	08	10
28-37	12	15
38-47	36	45
48-57	13	17
58 and above	11	13
Total	**80**	**100**
Marital status		
Single	15	18
Married	41	52
Divorced	08	10
Widowed	16	20
Total	**80**	**100**

Source: Field data, 2017

Results presented in table 1 indicate that the study comprised of majority 44 female (55%) and the least 36 (45%) were males. Majority of the patients 36 (45%) were in

the age brackets of 38-47 years with female preponderance and the least 08(10%) were in the age brackets of 18-27 years.

Table 2: Showing Education status and Occupation of respondents

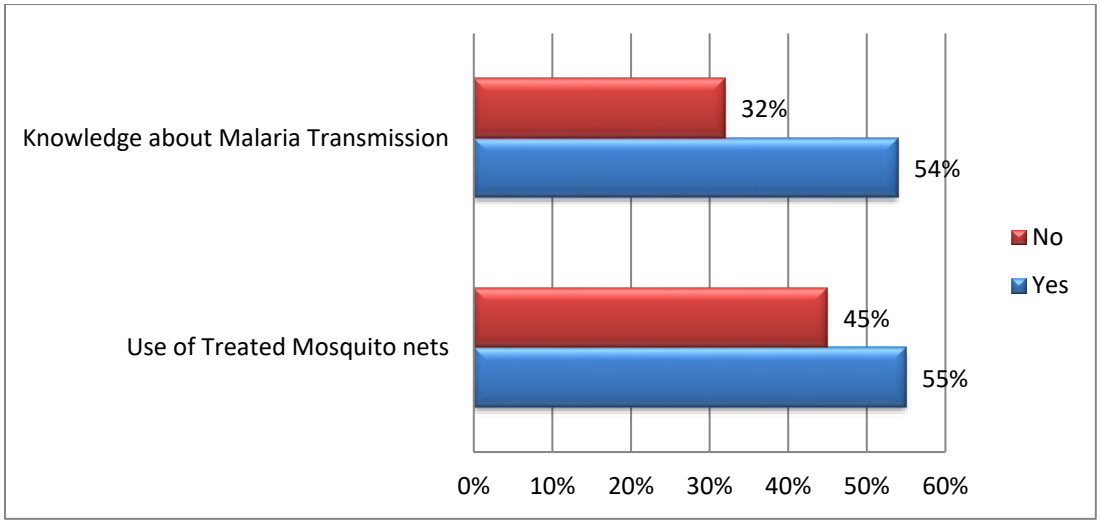
Variables	Frequency (n)	Percentage (%)
Educational Status		
No Formal Education	17	22
Some Primary Education	04	05
Completed primary	24	30
Completed secondary	28	35
Completed tertiary	07	08
Total	**80**	**100**
Occupation		
Civil Servant	08	10
Farmer	29	37
Business	17	22
Housewife	11	13
Student	07	08
Un-employed	08	10
Total	**80**	**100**

Source: Field data, 2017

Out of the targeted respondents, majority 28(35%) of the patients affirmed to have completed secondary education while the least 04(5%) revealed that they had acquired some primary education. It was further noted that majority of the respondents 29 (37%) were farmers while the least 08(10%) were civil servants.

4.2 Factors associated with malaria infections in HIV Positive patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

Figure 1: Showing factors associated with malaria infection among HIV+ patients (N=80)



Source: Field data, 2017

Results presented in table 2 indicate that majority of the patients 44(55%) slept under treated mosquito nets while the least 36(45%) never slept under treated mosquito nets.

From the table 2above knowledge about malaria transmission, out of all participants (N= 80) interviewed on malaria transmission and prevention, majority 54(68%) out of 80 participants claimed to have some knowledge about malaria transmission while the least 26(32%) had no knowledge about malaria transmission. Out of the 54 (68%) of the respondents with knowledge about how malaria is transmitted, 33 (42%) claimed that malaria could be transmitted from an infected person to a healthy person and the rest 21(26%) claimed that either malaria cannot be transmitted from person to person or they had no idea at all.

Table 3: CD4 Count of participants (N=80)

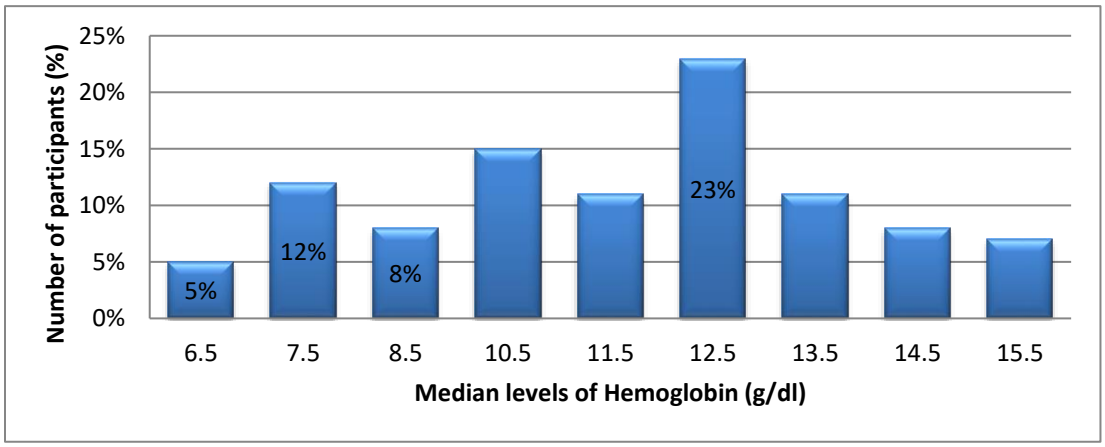
CD4 Count	Frequency (f)	Percentage (%)
<200	51	63
200-349	29	37

350-499	00	00
≥ 500	00	00
Total	**80**	**100**

Source: Field data, 2017

Analysis of CD4 was based on results of the most current CD4 count measurements carried out on patients enrolled in this study. Of 80 respondents, 51(63%) had a CD4* cell count less than 200 cells/L, and 29(37%) were in 200-350 cells/L.

Figure 2: Hemoglobin levels (N=80)



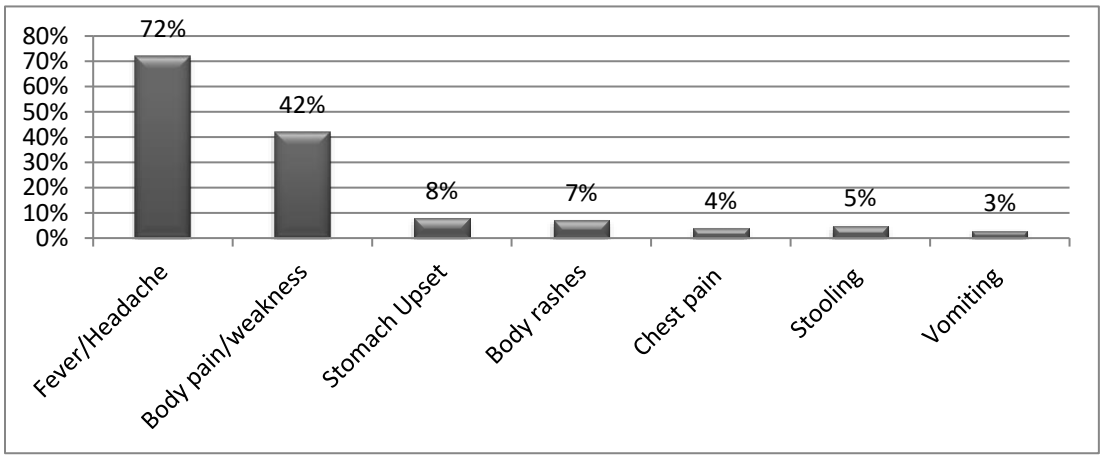
Source: Field data, 2017

Further details are reported Hemoglobin level of patients (participants) Hemoglobin (Hb) concentration levels of the patients ranged between 6.5 and 15.5 g/dl with majority 18(23%) of patients had Hb levels in the range of 12.5-12.9 g/dl. Malaria parasites were unlikely to be seen in those with normal haemoglobin levels (>10.5 g/dl).

4.3 The effect of malaria on HIV+ patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

Participants were asked to reveal the type of complaints they had during the time of the study at the clinic. The findings are presented as shown in figure 3.

Figure 3: Showing the patient complaints at Kyamuhunga Health Centre III (N=80)



Source: Field data, 2017

Results presented in figure 3 above indicate that majority of the patients 58(72%) complained of having fever and headache at the HIV clinic, followed by 34(42%) of the patients who complained of having body pain and weakness. Only 2(3%) reported issues of vomiting while at Kyamuhunga Health Centre III. In addition, data was crosschecked the ward statistic's registries of admissions, discharges, diagnoses and deaths. The patient outcome was dichotomized as either "discharged alive from the hospital" or "fatal outcome", meaning that the patient died during the hospital stay. It was noted that of 80 respondents, majority 50(63%) participants had a significant lower CD4 count compared to HIV positive without malaria.

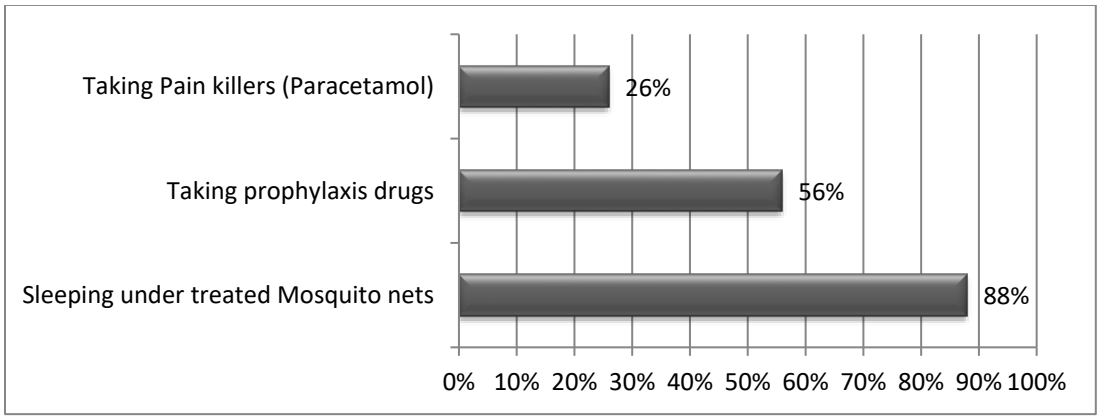
While assessing how malaria, affected the HIV positive patient's health, 2(4%) of the participants complained of chest pain. During the interview with one of the

participants, she was quoted saying " *I felt sick sometime back, my body was weak and I developed cough, when I was brought for treatment, I was diagnosed with anemia"*

4.4 Treatment and prevention measures that can be put in place to control the prevalence of malaria among HIV+ Patients.

Participants were asked to reveal what they had done to control malaria infection and the results are presented as shown in figure 4 below;

Figure 4: Showing treatment and prevention measures put in place to control the prevalence of malarial among HIV+ Patients

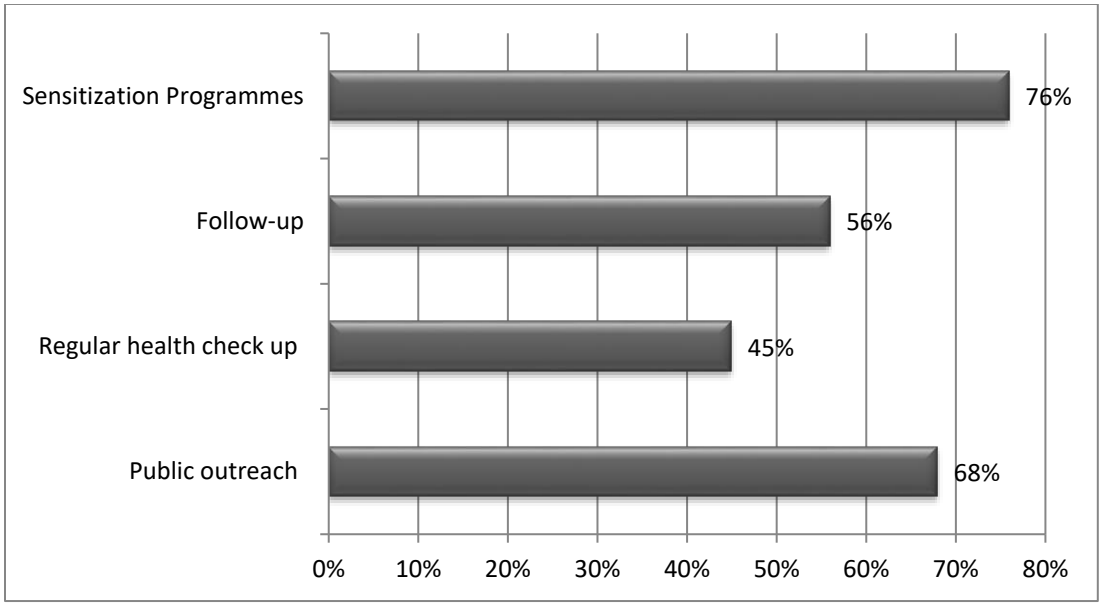


Source: Field data, 2017

Results presented in figure 4 above indicate that majority 70(88%) of the participants in this study affirmed that they slept under treated mosquito nets to control malaria infection; followed by 45(56%) who revealed that they took Prophylaxis drugs to treat malaria infection and lastly the least 21(26%) asserted that they used pain killers (Paracetamol) to reduce fever.

In addition to the above, participants were asked to reveal what they thought could be done to control the prevalence of malaria in their households and communities and the findings are presented as shown in figure 5 below;

Figure 5: Suggested measures to be put in place to control the prevalence of malarial



Source: Field data, 2017

Results presented in figure 5 above indicate that majority 61 (76%) of the participants urged the government to use of advocacy methods for sensitization programmes would assist in controlling the prevalence of Malaria in communities and households in Kyamuhunga Sub-County. In addition, majority 54(68%) urged that the government should provide effective public outreach to educate people about treatment and control of these diseases (HIV and Malaria). Further still, majority 45(56%) urged nurses and doctors to schedule follow-ups, to visit and assess HIV+ patients at their homes. In

addition, 36(45%) of the respondents urged patients to adhere to regular checkup about their state of health.

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS TO THE STUDY FINDINGS

5.0 Introduction

This chapter presents the discussions conclusions and recommendations to the study based on the findings on the assessment of the factors contributing to the high prevalence of malaria among HIV patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

5.1 Discussion of the study findings

5.1.1 Demographic characteristics of respondents

Of 80 respondents who participated in the study, majority were female patients while the least were males. It was noted that majority36 (45%) were in the age range of 38-37 years. Age was an important risk factor; patients aged 18-37years and >47years had reduced odds of having malaria while dominant among HIV Positive patients aged 38-47 years. This is in line with Johnbull et.al, (2014) noted that the prevalence of malaria among HIV-positive pregnant women and the odds of having malaria doubled with living in a rural community. A number of risk factors were associated with malaria infection. Age was an important risk factor; women aged 26-30years and >30years had reduced odds of having malaria. The odds of having malaria infection doubled when moving from urban to rural settlements

Results further showed that majority 28(35%) had acquired secondary education and the least 04(5%) had acquired some primary education with a slightly bigger number of respondents 17(22%) who never accessed any formal education. The study showed that only 07(09%) having had some tertiary education. It was noted that the higher chances of having malaria increased among patients with secondary level of education

due to their adolescent life styles. This may suggest that majority of the participants did not access viable relevant knowledge of control malaria transmission among HIV+ patients. This is in line with Dike et.al, 2006) who noted that higher levels of education were associated with improved knowledge and practice about the appropriate strategies for the prevention and treatment of malaria.

Results showed that majority 29(37%) of the respondents were small scale farmers, 08(10%) of the patients in this study were unemployed. It was noted that the higher chances of having malaria was found among majority patients who were farmers as compared to civil servants. This may indicate that majority of the patients were engaged in farming since Kyamuhunga Sub-county is dominated of majority rural farmers who practice farming. This is in line with Johnbull et.al, (2014) who noted that the chances of having malaria doubled with HIV-Positive patients living in rural communities.

5.1.2 Factors associated with malaria infections in HIV+ Positive patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

Based on the study findings, it was noted that Knowledge about malaria transmission 54(68%) and use of treated mosquito nets 44(55%) were the major factors associated with malaria infections among HIV+ positive patients. It was noted that 33(42%) participants claimed that malaria could be transmitted from an infected to a health person and the rest 21(26%) claimed that either malaria cannot be transmitted from person to person or they had no idea at all. This is in line with (ibid, 2014) who noted

that illiteracy or no education was a contributory factor as this group had the highest mean density.

Details on Hemoglobin level of patients (participants) reported the concentration levels of the patients ranged between 6.5 and 15.5 g/dl with majority 18 (23%) of patients had Hb levels in the range of 12.5-12.9 g/dl. This represents the advanced stage of immuno-suppression. Malaria parasites were unlikely to be seen in those with normal haemoglobin levels (>10.5 g/dl). This implies that patients with the Haemoglobin level less than 10.5 g/dl indicated malaria positive and the overall prevalence of malaria among the HIV patients was 20 (25%) of the respondents. This is in line with Johnbull et.al,(2014) who noted that Pregnant women on ART therapy had an increased odds ratio of having malaria parasites. Malaria parasites were unlikely to be seen in those with normal haemoglobin levels (>10 g/dl).

5.1.3 The effect of malaria on HIV+ patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District

Results presented in figure 1 above indicate that majority 58(72%) of the patients complained of having fever and headache at the HIV clinic, body pain and weakness, chest pain and issues of vomiting while at Kyamuhunga Health Centre III.

It was noted that the prevalence of malaria among HIV positive patients made them feel weak all the time and caused anemia. One of the respondents during the interview was quoted saying "*I feel weak all the time. Whenever I visit the clinic I am diagnosed with malaria infection, I spend almost two weeks very weak and this disrupts my daily activities*". In addition to the above, febrile illness (Fever and headache) was a

common complaint in HIV positive patients and may be due to a multitude of other causes than malaria, including viral, bacterial and other parasitic or opportunistic infections, many of which may have clinical features indistinguishable from malaria. The results are in line with Alemu et.al, (2013) who urged that fever indicated a cytokine response that might increase concentrations of HIV-1 RNA which restricted the normal response to the cytokine stimuli of malaria.

I further assessed the overall, HIV and malaria co-infected patients had a significant lower CD4 count compared to HIV positive without malaria. Similarly, a significantly lower CD4 count among respondents on ART to those not on ART. Changes in CD4 count in association to malaria parasite co-infection and HIV only in relation to ART status interaction. These findings are in line with Manas et.al, (2015) who noted that changes in blood cell counts are a well-known feature of malarial infections. These changes involve major cell lines including red blood cells (RBC), leukocytes and thrombocytes. Hematological changes in the course of a malaria infection, such as anemia, thrombocytopenia and leukocytosis or leucopoenia are well recognized in HIV positive patients.

While assessing how malaria affected the HIV positive patient's health, it was noted that a higher prevalence of malaria in HIV infected patients was more likely to cause anemia than patients with only malaria infection. This is in line with Tay et.al, (2014) who argued that Anaemia is one of the complications in both malaria and HIV infections and contributes to its morbidity and mortality.

5.1.4 The treatment and prevention measures that can be put in place to control the prevalence of malaria among HIV+ Patients

According to the study findings, HIV positive patients were treated with 25 mg/kg of CQ (Avloclor, ZENECA, 10 mg/kg on days 0 and 1, 5 mg/kg on day 2) plus a single dose of 1.25 mg/kg pyrimethamine and 25 mg/kg sulfadoxine (Fansidar, Roche) on day 0. All doses were directly observed and if a patient vomited within thirty minutes of dosing, the medication was re-administered.

Paracetamol was administered to all patients. Patients were followed on days 1, 2, 3, 7, 14, 21 and 28 and follow-up consisted of a brief history, clinical examination and a blood smear for malaria on each day. This is in line with the WHO (2002) Treatment classification outcome over 28 days of follow-up.

In addition to the above, while interviewing one of the patients, she was quoted saying "*the government provided free treated mosquito nets and provided laboratory centre nearer to the people in Kyamuhunga Sub-county*".

The researcher went ahead to assess what could be done to control the prevalence of malaria in households and communities; it was noted that participants urged patients to go back to the clinic at any time if they feel ill, and receive full evaluation including examination of a blood smear. One participant urged that "*If patients do not return for scheduled follow-up, they can be visited and assessed at home*". In addition, one other participant certainly advocated for advocacy methods such as flyers and billboards to

be replaced with more innovative techniques involving celebrities to sensitize on possible control measure to reduce the prevalence of malaria among HIV positive patients.

Participants urged the government to provide effective public outreach to educate people about treatment and control of these diseases (HIV and Malaria). While assessing what could be done by health workers, one of the participants was quoted saying "*I think it would be better if a health worker visits patients' homes and monitors the patients' conditions and ensures regular health talks"*.

This is in line with Pestizid (2010) who asserted that the importance of community participation, health education, surveillance, improving public health systems, decentralization of malaria control implementation, local capacity building, income generation, involvement of civil society organisations, support of local research, intersectoral and regional cooperation would assist in controlling and preventing the prevalence of malaria among HIV+ patients.

5.2 Conclusions

This study at Kyamuhunga Health Centre III in Bushenyi District found out that that HIV infection increased the susceptibility for new malaria infections among HIV positive patients aged 38 years and above. Malaria infection was acquired with repeated exposure to malaria parasites especially for patients who did not use Treated mosquito nets. It is possible that the disadvantage of HIV positive patients greatly acquired unbalanced immunity with relative low CD4* cell count and unbalanced

haemoglobin levels, greatly affected with body pain and weakness, fever, headache and variety issues of vomiting.

Paracetamol, use of treated mosquito nets, clinical examination and patient follow-up were shown to provide a beneficial effect in preventing malaria infection among in HIV positive patients.

5.3 Recommendation

Adherence to cotrimoxazole prophylaxis should be reinforced in HIV positive patients and it should be reassessed if these patients present with acute episodes of malaria.

Comprehensive HIV care should be provided, including health education, antiretroviral therapy and malaria preventive materials such as insecticide-treated bed nets. This will help HIV positive patients to develop better health-related behavior and higher rates of self-treatment. In addition, some protease inhibitors used in the treatment of HIV infection may also be effective in the treatment or prevention of malaria. Protease inhibitors must be highly potent and specific for parasite proteases to be recognized as biological tools.

It is possible that the use of protease inhibitor (PI) - based antiretroviral therapy (ART) in HIV-infected patients living in areas of high malaria transmission could prevent malaria in this vulnerable population.

5.4 Implications to Nursing Practice

The findings in this study will be used by nurses to recommend appropriate measures to control malaria infections among HIV positive patients at household level.

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APPENDICES

APPENDIX I: CONSENT FORM

By signing this document, I am giving informed consent to be interviewed by the researcher. I understand that I will be part of the research study that is looking into factors contributing to the prevalence of Malaria among HIV patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District.

I understand that I have been selected to participant in this study because I am HIV positive receiving HIV care and treatment services at Kyamuhunga Health Centre III. I was also informed that the participation would be entirely voluntary and that am free to withdraw at any time.

The information from this study will be kept strictly confidential and my identity will not be disclosed or published anywhere even in the final report.

I also understand that results can be given to me if I ask for them and that the researcher is the person to contact if I have questions about my rights as a participant on this contact **0702976957.**

Signature: ---------- Date: ----------

(Respondent)

Researcher's Name: KAKURU JAMES

Signature: ---------- Date: ----------

APPENDIX II: EBYOKUBUZIBWA (RUNYAKOLE VERSION)

Bagyenzi bangye.

Amazina gangye nibanyeta **KAKURU JAMES.** Omwegyi ahitendekyero Kampala International University ahaitagyi erya Western Campus ishaka bushenyi disturikiti ndyaaha kucondoza nokureba ekirikukanyisa omushweiza gwensiri omubantu abaine akakoko kasiirimu ahairwariro rya ryabakakoko kasirimu ahari kyamuhunga health centre ya kashatu omuri bushenyi disturikiti

Amakuru agumurampereze nigaza kunyamba omubyetago byokwehangurira diploma yebyobushaho byebyamagara. Okucondoza oku ekihango nokwega kandi amakuru agumurampereze nigaza kutwazibwa nkebihama

Mwebare munonga.

Aha nimbashaba kukyebera aha ansa eyorasharemu

1. obuhangwa.

a) omushaija ☐ b) omukazi ☐

2. orurengo rwemyaka

a) 18-27 ☐ b) 28-37 ☐

c) 38-47 ☐ d) 48-57 ☐

e) 58 nokukiraho ☐

3. Obushwere

(a) Tinkashweire ☐ b) nashweire ☐

c) Tukatana ☐ d) Nyamwandu ☐

4. Okushoma

(a) Tokazahoga omwishomero ☐ (b) Okazaho omu puraimare ☐

(c) Okaheza puraimare ☐ (d) Okaheza sinia ☐ e) Okaheza eidara eryahaiguru ☐

5. Omurimo

☐

☐

(a) Omukozi wa gavumenti

(b) Omuhingi

(c) Omushubuzi ☐

(d) Omukazi wahakyaro ☐

(e) Omwegi ☐

(f) Tinyine murimo ☐

(g) ogundi omurimo (gugambeho) ☐

……..

6. Haine ekyo kwetombwaita?

a) Ego ☐ Ngaha ☐

7. Nikiha ekyorikwetombwita?

a) Omuriro/Omutwe ☐

b) Okushasha amagara gona/okuhwa amani ☐

c) Okuteganisibwa omunda ☐

d) Okucweka oruhere omubiti ☐

e) Okushasha ekifuba ☐

f) Okushoza kubi ☐

g) Okutanaka ☐

O) Ebindi (kishooborore aheife);

……

……

……

8. Norara omukatimba kensiri?

a) Ego ☐

b) Ngaaha ☐

9. Haine ekyorikumanya aha mushwaija gwe nsiri okugurikukwata?

a) Ego ☐

b) Ngaaha ☐

10. Obwingi bweshagama yawe

……

11. Obwingi bwobutafari obwa CD4

……

12. Nidyari obwokurwazibwa omushwaija gwensiri?

…….

13. Omushwaija gwensiri gukozireki aha bwingi bweshagama yawe ?

……

……

……

……

14. Omushweija gwensiri gukozireki aha bwingi bwobutafari obwa CD4?

……

……

……

15. Ahandi ninkahi ahi omushwaiza gwensiri guteganaise ahamagara gawe?

……
……
……

16. Okozire ki kukingira omushweija gwensiri?

……
……
……

17. Notekateka hakakorwaki kuzibira okuzanzara kwomushweiza gwensiri omumaka nomubyaro kurugirira aha nkoora eya ?

Ahagavumenti

……
……
……

Ahabashaho

……
……
……
……
……

Webare Kukoragana Nanye

APPENDIX III: SEMI STRUCTURED QUESTIONNAIRE (ENGLISH VERSION).

Dear respondent.

My name is **KAKURU JAMES** a student of Kampala International University-Western Campus. I am conducting a study to assess the factors contributing to the prevalence of Malaria among HIV patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District. The information obtained will help me fulfill the requirements for the Award of the Diploma in Nursing. This study is mainly academic and the information given to me will be treated with maximum confidentiality.

Thank you in advance.

Note: (Please Tick (✓) according to your appropriate decision)

1. Gender

a) Male ☐ b) Female ☐

2. Age range

a) 18-27 ☐ b) 28-37 ☐

c) 38-47 ☐ d) 48-57 ☐

e) 58 and above ☐

3. Marital status

(a) Single ☐ b) Married ☐

c) Divorced ☐ d) Widowed ☐

4. Educational Status

(a) No Formal Education ☐ (b) Some Primary education ☐

(c) Completed Primary ☐ (d) Completed Secondary ☐

(e) Completed Tertiary ☐

5. Occupation

(a) Civil servant

(b) Farmer ☐

(c) Business ☐

(d) Housewife ☐

(e) Student ☐

(f) Un-employed ☐

(g) Others (Specify)

……..

6. Do you have any compliant?

a) Yes ☐ No ☐

7. What type of Complaint?

a) Fever/Headache ☐

b) Body pain/weakness ☐

c) Stomach Upset ☐

d) Body rashes ☐

e) Chest pain ☐

f) Stooling ☐

g) Vomiting ☐

Others (explain below);

……

……

8. Do you sleep under treated mosquito nets?

a) Yes

b) No

9. Do you have any knowledge about malaria transmission?

a) Yes ☐

b) No ☐

10. Hemoglobin level

……

11. CD4 count

……

12. How often do you fall sick of malaria?

…….

13. How has malaria infection affected your hemoglobin level?

……

……

……

14. How has malaria infection affected the CD4 count?

……

……

……

15. How else has malaria affected your health?

……
……
……

16. What have you done to control malaria infections?

……
……
……

17. What do you think can do to control the prevalence of malaria in your household and community by the following practitioners?

By the government

……
……
……

By Health works

……
……
……

Thank you for your participation

APPENDIX III: INTERVIEW GUIDE

Dear respondent.

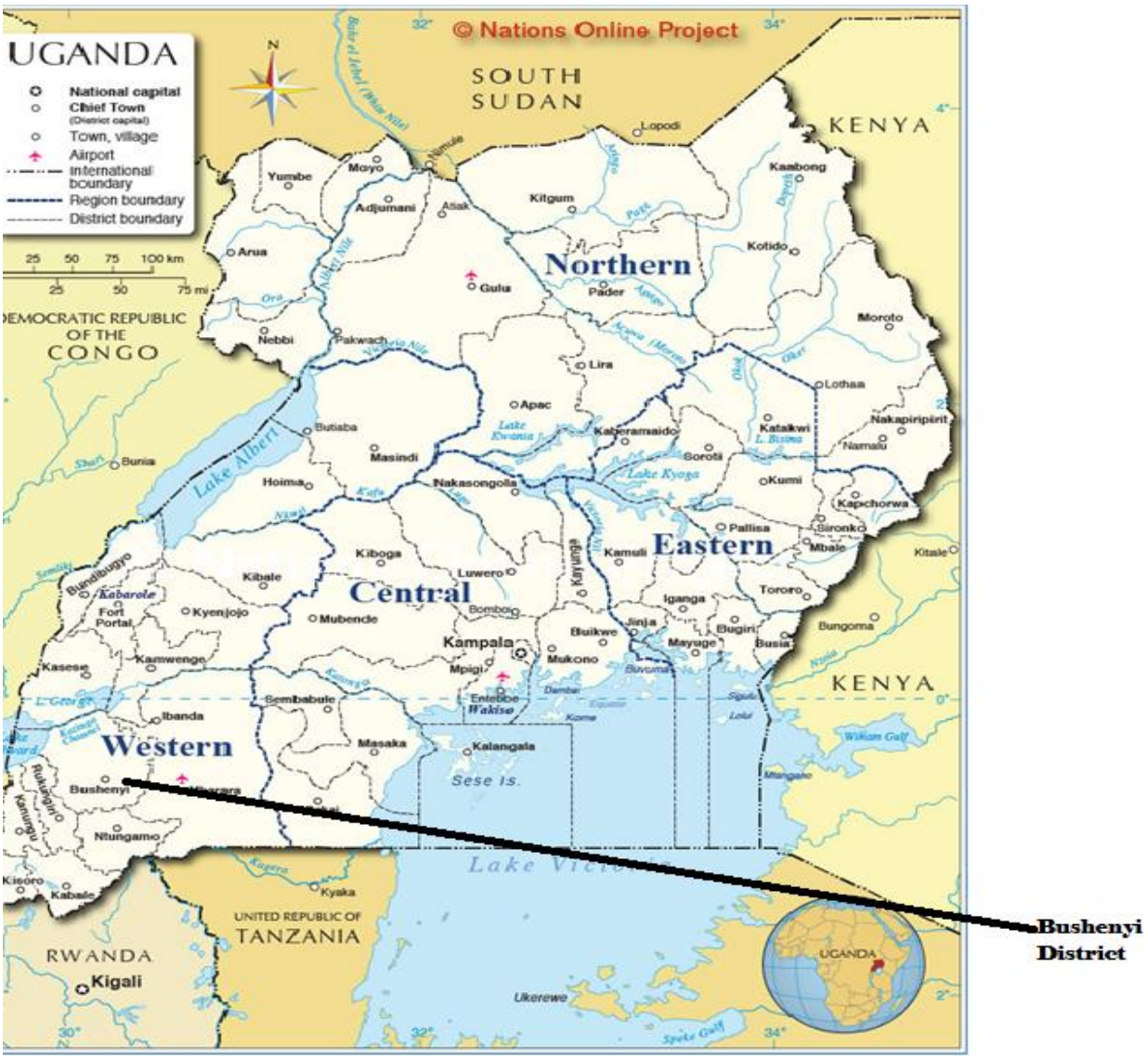
My name is **KAKURU JAMES** a student of Kampala International University-Western Campus. I am conducting a study to assess the factors contributing to the prevalence of Malaria among HIV patients attending HIV Clinic at Kyamuhunga Health Centre III in Bushenyi District. You have been select respondent to provide relevant information to the study. The information obtained will help me fulfill the requirements for the Award of the Diploma in Nursing. This study is mainly academic and the information given to me will be treated with maximum confidentiality.

Thank you in advance.

1. Please share with me about the type of compliant that brought you for treatment
2. Do you have any knowledge about malaria transmission?
3. How often do you sleep under treated mosquito nets?
4. Do you have any knowledge about malaria transmission?
5. How often do you fall sick of malaria?
6. Do you know your Hemoglobin?
7. If yes, how has malaria affected your hemoglobin level?
8. What is your CD4?
9. How has malaria infection affected the CD4 count?
10. How else has malaria affected your health?
11. What have you done to control malaria infections?
12. What do you think the government and health workers can do to control the prevalence of malaria in your household and community by the following practitioners?

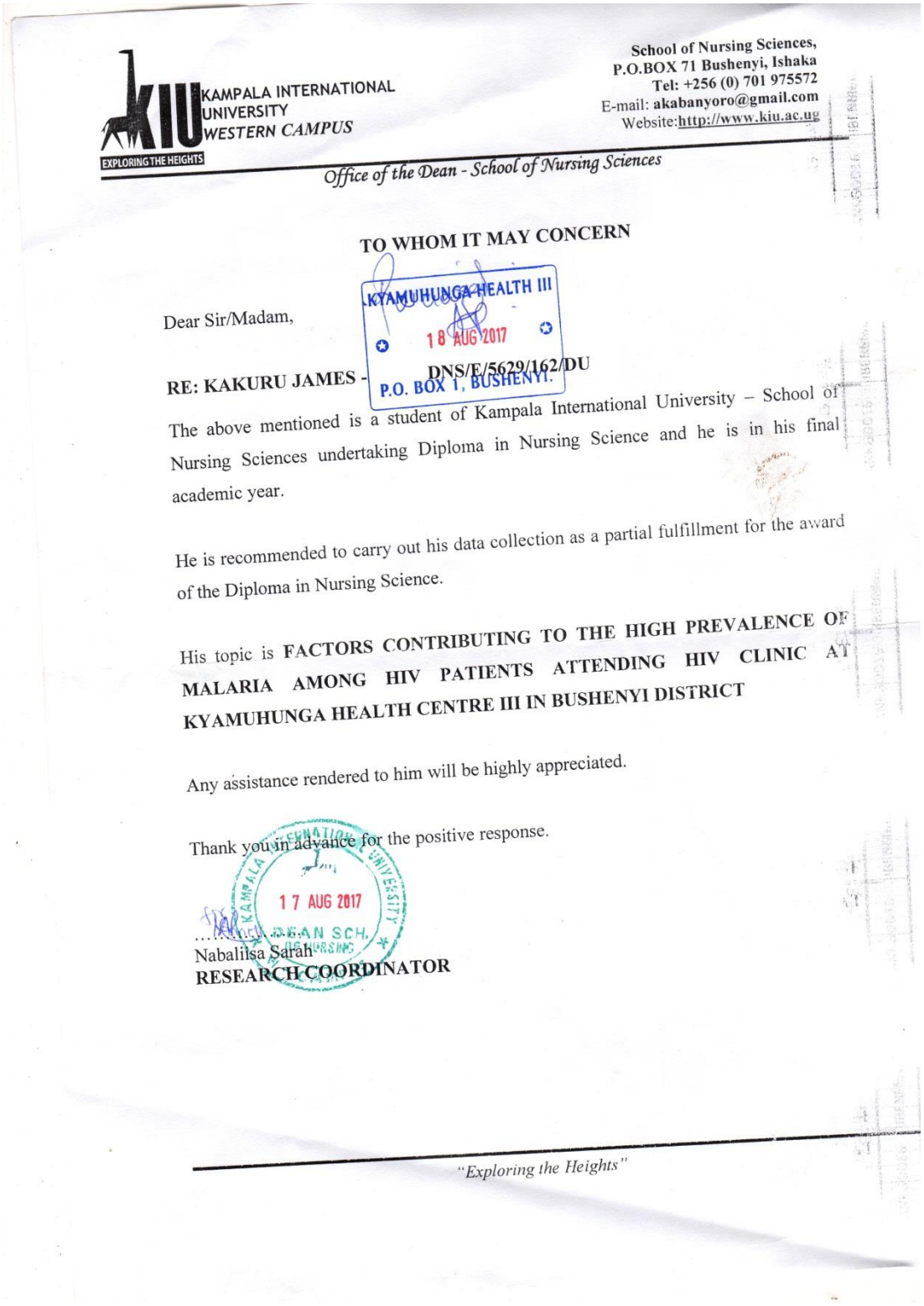
Thank you for your participation

APPENDIX IV: MAP OF UGANDA SHOWING BUSHENYI DISTRICT



APPENDIX V: A MAP OF BUSHENYI DISTRICT SHOWING KYAMUHUNGA HEALTH CENTRE III IN KYAMUHUNGA TOWN COUNCIL

APPENDIX VI: RECOMMENDATION LETTER



KAMPALA INTERNATIONAL UNIVERSITY
WESTERN CAMPUS
EXPLORING THE HEIGHTS

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Website:http://www.kiu.ac.ug

Office of the Dean - School of Nursing Sciences

TO WHOM IT MAY CONCERN

KYAMUHUNGA HEALTH III
18 AUG 2017
P.O. BOX 1, BUSHENYI.

Dear Sir/Madam,

RE: KAKURU JAMES - DNS/E/5629/162/DU

The above mentioned is a student of Kampala International University – School of Nursing Sciences undertaking Diploma in Nursing Science and he is in his final academic year.

He is recommended to carry out his data collection as a partial fulfillment for the award of the Diploma in Nursing Science.

His topic is **FACTORS CONTRIBUTING TO THE HIGH PREVALENCE OF MALARIA AMONG HIV PATIENTS ATTENDING HIV CLINIC AT KYAMUHUNGA HEALTH CENTRE III IN BUSHENYI DISTRICT**

Any assistance rendered to him will be highly appreciated.

Thank you in advance for the positive response.

17 AUG 2017
DEAN SCH. OF NURSING

Nabalilsa Sarah
RESEARCH COORDINATOR

"Exploring the Heights"