Prevalence of Premalignant Cervical Lesions and Factors influencing Uptake of Cervical Cancer Screening Services among HIV Positive Women attending the HIV Clinic at Kampala International University Teaching Hospital, Bushenyi, Uganda

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Medicine in Obstetrics and Gynaecology of Kampala International University

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Declaration

I Dr Bekson Tayebwa, hereby declare that the work presented in this dissertation titled "prevalence of premalignant cervical lesions and Factors influencing uptake of cervical cancer screening services among HIV Positive Women attending the HIV Clinic at Kampala International University Teaching Hospital, Bushenyi, Uganda" is original and a product of my effort. It has never been presented anywhere by me or any other person for any award or any other reason.

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Approval

I have supervised Dr Bekson Tayebwa in the process of developing this research dissertation titled “prevalence of premalignant cervical lesions and Factors influencing uptake of cervical cancer screening services among HIV Positive Women attending the HIV Clinic at Kampala International University Teaching Hospital, Bushenyi Uganda” and I hereby approve this work to be forwarded to the next level for consideration.

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Dedication

I would like to dedicate this dissertation to my dear wife Grace Tayebwa for her unwavering support throughout the entire course.

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List of Abbreviations

CC: Cervical Cancer

CIN: Cervical Intraepithelial Neoplasia

HAART: Highly Active Anti-Retroviral Therapy

HIV/AIDS: Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome

IARC: International Agency for Research on Cancer

KIU-TH: Kampala International University Teaching Hospital

VIA: Visual Inspection under Acetic acid

Operational Definitions

Cervical cancer screening: Examination of a group of usually asymptomatic individuals to detect those with cervical epithelial lesions that are considered to be cancer precursors by means of an inexpensive diagnostic test. In this study, it referred to the rate of uptake of screening services to determine the prevalence of premalignant cervical lesions.

Uptake of cervical cancer screening: The action of making use or utilization of cervical cancer screening services.

Socio-demographic factors: These are group related factors defined by sociological and demographic characteristics. These include age, race, ethnicity, religion, language, education level, wealth and occupation.

Health system related factors: These refer to factors that are related to how services provided to individuals or communities by agents of the health services or professions for the purpose of promoting, maintaining, monitoring, or restoring health. These include availability and access of cervical cancer screening services, cost of services, distance from the hospital, average waiting time, health worker-patient relationship and communication skills and knowledge of the services.

Abstract

Background: Cervical cancer remains the leading gynecological malignancy causing deaths and morbidity in Africa. Nine in every 10 worldwide cervical cancer deaths occur in developing countries especially in Sub-Saharan Africa and is the leading cause of cancer deaths in females in Uganda. This study determined the uptake rate of cervical cancer screening services, Prevalence of premalignant cervical lesions, and factors influencing uptake of cervical cancer screening services among HIV positive women attending Kampala International University Teaching Hospital (KIU-TH) HIV/AIDS Clinic.

Methods: This was a hospital-based descriptive cross-sectional study conducted at Kampala International University Teaching Hospital HIV/AIDS Clinic. Consecutive sampling method was used to recruit 210 women aged 21-65 years. Pretested interviewer administered questionnaires were used to collect data, then entered into Microsoft Excel version 10 and imported into Stata 14 for analysis. Descriptive statistics were used to describe the characteristics of study participants, their clinical characteristics, uptake rate of cervical cancer screening services and prevalence of premalignant cervical lesions. Pearson Chi-square test followed by logistic regression analysis were conducted to assess the relationship between socio-demographic and health system related factors and uptake of cervical cancer screening services stratified by location of residence. All independent variables with p-values ≤ 0.05 and those with biological plausibility were entered into a multivariate model.

Results: Of the 210 HIV positive women recruited, the uptake rate of cervical cancer screening services was 160(76.2%). Out of the 160 women who participated in cervical cancer screening, 35(21.9%) had premalignant cervical lesions. Women with primary education (aOR = 0.8, 95% CI: 0.71-0.96, p = 0.02) and secondary education (aOR = 0.8, 95% CI: 0.61-0.91, p = 0.01) showed a lower statistical likelihood of uptake of cervical cancer screening services. Women who came far from the nearest health centre and had to use a vehicle also showed a lower statistical likelihood of uptake (aOR = 0.5, 95% CI: 0.26-0.89, p = 0.02). Fear of being diagnosed with cervical cancer led to a lower likelihood of uptake (aOR = 0.4, 95% CI: 0.29-0.67, p = 0.01). Preference of the health workers' female gender [overall (aOR = 2.9, 95% CI: 1.59-0.5.34, p = 0.01) and either gender (aOR = 2.7, 95% CI: 1.52-4.92, p = 0.01) were associated with a higher likelihood of uptake of cervical cancer screening services.

Conclusions: The study shows a moderately higher uptake of cervical cancer screening and low prevalence of premalignant cervical lesions among women attending HIV clinic at KIU-TH. Formal education, fear of being diagnosed with cervical cancer and far distance from the nearest health centre reduced uptake of cervical cancer screening services while preference of female or either gender of the health worker led to increased uptake of cervical cancer screening services. This study recommends routine cervical cancer screening at the HIV clinic, recruitment of more female health workers at cervical cancer screening clinics, health talks in the formal education sector and health education focusing on alleviating fear of being diagnosed with cervical cancer.

Chapter One

Introduction

1.1 Background

1.1.1 Historical background

Cervical cancer screening is the major public health strategy for secondary prevention of cervical cancer especially in the HIV infected women. Screening services have been expanding since the WHO (2014) guideline advocating for a Visual Inspection under Acetic acid (VIA) or Human Papilloma Virus (HPV-based) "screen and treat" approach, with mobile units reaching more rural areas and cervical cancer prevention integrating HIV and family planning services (Menon, Rossi, Harmon, Mabeya, & Callens, 2017). Born on 13th May, 1883 in Greece, George Papanicolaou is considered the father of cervical cancer screening. He was the pioneer in studying the cytologic characteristics of the reproductive tract. He invented the Papanicolaou test which is now commonly known as the Pap smear (Chandrasekhar & Krishnamurti, 2018).

However, before Papanicolaou, Walter Hayle Walshe had studied cancerous cells under a microscope and written in a book on lung diseases, a century earlier. Also Aurel Babe, a Romanian physician had collected cells from the cervix for the presence of cancer in 1927, using a platinum loop. Medical history has, however, sided with Dr Papanicolaou as he revolutionized the Pap test in 1943 in his work with Dr Herbert Traut in a book "Diagnosis of uterine cancer by vaginal smear." It took over 150 years for Human Papilloma Virus (HPV) to be established as the cause of cervical cancer in the 1980s. Verona gave the first clue to the etiology before Rigoni-Stern observed that sexual behavioral history was more linked to cervical and uterine cancer (Reynolds & Tansey, 2009).

Cervical cancer screening improved in the 1940s where they started to use screeners and later medical personnel started getting involved. Cytologists started screening later in 1960s but they were few by that time. It was a reality later when universities started training histopathologists with cytology skills and particularly gynecological cytology (Reynolds & Tansey, 2009). In the

1950s, cervical cancer screening increased greatly shortly after the Canadian and American cancer societies endorsed the Pap smear as an effective cancer prevention test (Patricia, 2000).

With the discovery of Human Immunodeficiency Virus (HIV) infection in the early 1980s, cervical cancer was observed to be commonest in the infected women (Franceschi & Jaffe, 2007). Most high income countries (HIC) like the United States were able to control cervical cancer in the HIV population by doing annual screening by a Papanicolaou smear. They were able to detect over 94% of the cervical cancer cases at the in-situ stage and this eased management (Franceschi & Jaffe, 2007). Later in 2013, the World Health Organization recommended that all women with HIV should have annual screening and these guidelines have been adopted by most other countries (World Health Organisation, 2013). Following these recommendations, various papers have been published concerning how best annual screening can be achieved since the uptake of screening services is still low. Most have suggested integration of cervical cancer screening services with HIV/AIDS healthcare services to increase coverage. This has been shown to increase coverage and uptake of screening services (Nabukenya, Matovu, Nangiya, Kawuma, Odiit & Mukasa, 2014).

1.1.2 Theoretical background

Cervical cancer screening is mainly to do with preventive medicine. It is more related to how people behave in society and their health-care seeking behavior. Very many theories have been postulated concerning preventive medicine. Though there has been less investment in preventive medicine, available evidence suggests that it is effective to tackle behavior change interventions at individual, community and population levels (Davis, Campbell, Hildon, Hobbs, & Michie, 2015). This study will be based on the Theory of Planned Behavior/Reasoned Action as put by Ajzen (1991).

The theory of planned behavior states that an individual's behavioral intentions are shaped by a combination of attitudes towards behavior, subjective norms and perceived behavioral control (Ajzen, 1991). In this regard, an individual's uptake of cervical cancer screening service is largely shaped by their perception of the importance of seeking health care; thence, cervical

cancer screening (Davis et al., 2015). However, the knowledge and perception concerning other health system related factors also affect behavior towards uptake of screening services.

Originally the theory of planned behavior referred to "intention" in terms of trying to perform a given behavior or activity rather than in relation to actual performance or uptake. For example intention to screen for cervical cancer vis-à-vis being screened in the real are two different things. However, earlier research with the model revealed strong correlations between measures of the theory that asked about trying to perform a given behavior or activity and measures that dealt with actual performance of the behavior. Hence, majority who show intention to perform an activity actually go ahead to do it (Ajzen, 1991).

The theory of planned behavior has been widely studied in medicine and has many applications including use in predicting of behavior related to usage of drugs. Bryan also used it in studying behavior related to sex in 2002 (Davis et al., 2015). Armitage (2005) also used this theory to predict maintenance of physical activity. The variables used for these studies included attitudes, subjective norms and perceived behavioral control. Perceived behavioral control was found to be the most significant factor. Most of these study findings suggested that in order to change health-related behavior, consideration should be made for the participants' attitudes and intentions to effect change (Ajzen, 1991).

This study sought to determine the uptake rate of cervical cancer screening services or how the HIV infected women behave towards screening for cervical cancer. It also assessed the factors related with this behavior. The factors considered include socio-demographic and health-system-related factors. These factors affect the planned behavior of the population at individual and community levels towards uptake of cervical cancer screening.

1.1.3 Conceptual background

In this research, the socio-demographic and health-system related factors that influence the uptake of cervical cancer screening services was studied. In this section, we describe the different concepts under the conceptual framework as they were applied to this study. Socio-demographics are group-related characteristics defined by sociological and demographic characteristics. These include age, race, ethnicity, religion, language and education level among

others. It also includes socio-economic status including wealth and occupation (Twinomujuni, Nuwaha, & Babirye, 2015). For this study, the socio-demographic patient characteristics will include age, tribe, religion, education level and income level. Other factors considered were the social influence from family and patient specific parameters like duration on Anti-Retroviral therapy (ART) and others.

Health system related factors refer to factors that are related to how services provided to individuals or communities by agents of the health services or professions for the purpose of promoting, maintaining, monitoring, or restoring health. These refer to availability and access of cervical cancer screening services, cost of services and distance from the hospital, average waiting time, health worker- patient relationship and communication skills and knowledge of the services. Health system related factors include knowledge of cervical cancer screening services, availability, access and cost of screening services, distance from hospital and waiting time at the institution. We also assessed how the patients view the health care system and their preference on integration of HIV and cervical cancer screening services under the same roof.

Screening refers to examination of a group of usually asymptomatic individuals to detect those with a high probability of having a given disease, typically by means of an inexpensive diagnostic test (World Health Organisation, 2013). Cervical cancer screening therefore refers to evaluation of the cervix for premalignant lesions before they turn into cancer. It is recommended for all females from age of 21 regardless of the age of onset of sexual activity. According to American College of Obstetricians and Gynecologists, women aged less than 21 years should not be screened regardless of age at sexual initiation and other behavior-related risk factors and screening should be done every 3 years until the age of 65 years amongst HIV negative women (Voleman & Cifu, 2018). There after screening can be stopped at age >65 years with adequate negative prior screening results and no history of high grade cervical intraepithelial lesions. They however recommend HPV co-test every 5 years for women aged over 30 years. The World Health Organization recommends annual screening of all women with HIV and these guidelines have been adopted by most other countries (World Health Organisation, 2013). According to Uganda Clinical Guidelines of 2016, all women living with HIV are supposed to receive annual screening for cervical cancer.

Acquiring HPV is usually early in life and is largely influenced by individual behavior. Cervical cancer is caused by Human Papilloma Virus (HPV) which is sexually transmitted and is the most common viral infection of the reproductive tract. More than half of all sexually active individuals will be infected with HPV at some point in their lives and some may be repeatedly infected. The peak time for infection is shortly after becoming sexually active with a 40% rate of per-coital transmission (World Health Organization, 2013). Infection with HPV is often asymptomatic and most go away as the infection clears. In short term infection, "low grade" cervical changes may occur. But in some women, it does not go away and persists to cause severe cervical cell changes (High Grade) if the infection was by a high risk type of HPV (most frequently, types 16 and 18). These high grade changes usually lead to cervical cancer. If untreated, these lesions may progress to cervical cancer (World Health Organization, 2013). But if identified and managed early, this curbs the morbidity and mortality.

Human Papilloma Virus (HPV) is a necessary but not a sufficient cause for cervical cancer with 12 oncogenic types classified as group 1 carcinogens by the International Agency for Research on Cancer (IARC) Monographs. Other cofactors in the aetiopathogenesis of cervical cancer include smoking, parity (a higher number of full-term pregnancies increases risk), and oral contraceptive use (IARC, 2002).

Human behavior largely affects both HIV and Cervical Cancer spread. Because both HIV infection and HPV infection are sexually transmitted, the two infections are often found together. Over time, sexually transmitted infections (STIs) especially those that cause ulceration or inflammation of the genitals are associated with a role in HIV transmission. This therefore offers increased chance of contracting HIV infection in HPV infected individuals (UNAIDS, 2015). Effective screening and early treatment of precancerous cervical lesions with techniques like cryotherapy and excision procedures; are, thus, key factors in preventing cervical cancer in both HIV-infected and HIV-uninfected women (Franceschi & Jaffe, 2007).

The recommended methods of screening include Visual Inspection with Acetic acid (VIA), Visual Inspection with Lugol's Iodine (VILI) and Cytology Testing by Pap smear. HPV testing for high risk types is also becoming widely available. Of all the methods, biopsy using

colposcopy directed by VIA is 85-95% accurate compared to Pap test which give up to 15-40% false negatives (World Health Organisation, 2013).

In this study, we used Visual Inspection under Acetic Acid (VIA). This was chosen because it is recommended by the guidelines of Uganda and World Health Organization and is readily available in lower health facilities that participate in management of HIV. To do VIA, the woman is invited to lie down in a modified lithotomy position on a couch with leg rests or knee crutches or stirrups. A sterile speculum is then inserted into the vagina to visualize the cervix and then 5% acetic acid is applied to the cervix. After one minute, examination is done and findings and conclusions made. Detailed procedure has been described under appendix 6 of this proposal.

However, the World Health Organization recommends a "Screen and Treat" model in which the test gives immediate results (like VIA) and "on the spot" treatment of lesions (for example using cryotherapy) without any further test except if suspected cancer lesions are found. VIA is more readily available, easy to perform, affordable and has a low turn-over time ("Uganda Clinical Guidelines," 2016). Other models of screening include sequential testing in which treatment is offered after a re-screening test on follow up of those who had a positive first test and Screening followed by colposcopy-directed biopsy for those who turned positive and the treatment is based on the results of biopsy. Cervical cancer screening is the most reliable way of controlling the burden of this cancer.

Uptake of cervical cancer screening is the action of making use or utilization of cervical cancer screening services. Screening uptake is influenced by a number of factors. Though limited studies exist concerning the factors that influence uptake of screening in the HIV population, they are still known to be at a higher risk than the rest of the population. In this study, we shall assess the socio-demographic and health care related factors. In one community based survey in Uganda by Twinomujuni *et al* (2015) also found out that these factors influence uptake of screening and the uptake rate was still very low.

Outcome of screening refers to the result that will be found after screening for cervical cancer. In this study, the outcomes included the results of the patients whether they had cervical

premalignant lesions or not, or suspicious of cervical cancer. This helped to eventually determine the prevalence of premalignant cervical lesions.

1.1.4 Contextual background

According to GLOBOCAN (International Agency for Cancer Research), Cervical cancer remains the leading gynecological malignancy causing deaths and morbidity in Africa and other developing countries. About nine in every ten worldwide cervical cancer cases and deaths occur in developing countries especially in Sub-Saharan Africa. The average risk of dying from cervical cancer before age 75 is three times higher in the less developed than in the more developed regions (Nakisige, Schwartz, & Ndira, 2017).

East Africa also remains with a great burden and according to the Kampala cancer registry, Cervical cancer remains the leading gynecological malignancy in Uganda, with the trend of incidence going up by 1.8% per year (Wabinga et al., 2014). This trend has been attributed more to the HIV pandemic in the region. Some have reported the burden of premalignant lesions amongst women living with HIV up to a prevalence of 71.8% and only at 27.3% in the HIV negative population (Chambuso, Shadrack, Lidenge, Mwakibete, & Medeiros, 2017).

Cervical cancer is now considered an AIDS defining illness and for this reason, the World Health Organization (WHO) recommends annual screening of people living with HIV for premalignant cervical lesions (World Health Organisation, 2013). These guidelines have even been adopted by Uganda but are yet to be put into practice ("Consolidated Guidelines for Prevention and Treatment of HIV in Uganda," 2018). To enhance this possibility in this era, some have suggested integration of cervical cancer screening and HIV/AIDS healthcare services (Kumakech, Andersson, Wabinga, & Berggren, 2015).

In Uganda, some studies about integration of HIV and Cervical cancer screening have been done. In 2014, Nabukenya and colleagues also shared an experiential success story of screening for cervical cancer during delivery of HIV clinical care at Mildmay Uganda clinic (Nabukenya et al., 2014). They started screening the HIV infected women for cervical precancerous lesions in 2008 using Pap smear and they introduced visual inspection under acetic acid (VIA) in 2011. They were using trained nurses to offer screening through an opt-out model and would do on-site see-

and-treat (same day treatment) using cryotherapy for those who had lesions that could be treated. They reported a successful experience with a drastic increase in uptake of screening and reduction of advanced cancerous lesions in the subsequent years as these would be identified at early stages (Nabukenya et al., 2014).

In a more recent and local study at KIU Teaching Hospital, the prevalence of premalignant lesions was estimated at 22% (Mulumba, Lule, Atuhaire, Bonet, & Diaz, 2018). This study was carried out in the general population and did not specify about the HIV infected women. Screening for cervical cancer in the HIV clinic at KIU-TH is not done routinely. And when it is done, it is at a cost that is catered for by the patient. KIU-TH is a private hospital. The Hospital has an HIV clinic with over 1000 clients enrolled on Antiretroviral Therapy (ART). These drugs are paid for by the government under public private partnership grants but they do not cater for other services like screening for cervical cancer.

1.2 Problem statement

Cervical cancer is the fourth leading cause of mortality in women globally and the leading gynecological malignancy in developing countries like Uganda (Bray, Ferlay, & Soerjomataram, 2018). About 2,275 cervical cancer deaths occur annually in Uganda (Bruni, Barrionuevo-Rosas, Albero, Serrano, Mena, Gómez, *et al* (2017). Although the overall incidence rate in Uganda is estimated at 44 per 100,000 women and even higher in HIV infected women estimated at 60 per 100,000 (Nakisige et al., 2017), there is still low utilization of screening in the Ugandan women (Twinomujuni et al., 2015). Despite the adoption of the World Health Organization recommendation of annual cervical cancer screening for women living with HIV, cervical cancer screening in HIV clinic at KIU-TH is not routine and only done on request by the client. And when it is done, it is at a cost that is catered for by the patient. Yet, women with HIV are about four to ten times more likely to develop high grade cervical lesions than HIV negative women (Santesso N et al, 2016). Moreover, little is known about the uptake rate in an entirely HIV population.

The prevalence of premalignant cervical lesions at KIU Teaching Hospital was high and estimated at 22% in a study by Mulumba *et al* (2018), but their study did not establish the

prevalence in the HIV infected women and neither did it indicate the uptake rate or even the factors affecting uptake of screening services. HIV/AIDS also remains a great burden in Uganda where the prevalence is still high with an estimated 7.1 (6.6-7.7)% of the Ugandans having the condition (Uganda Bureau of Statistics, 2016).

1.3 Objectives

1.3.1 Broad Objective

To determine the prevalence of premalignant cervical lesions and factors influencing uptake of cervical cancer screening services among HIV positive women Kampala International University HIV Clinic in Western Uganda.

1.3.2 Specific Objectives

1. To determine the uptake rate of cervical cancer screening services amongst HIV positive women attending the HIV/AIDS clinic at KIU Teaching Hospital.

2. To determine the prevalence of premalignant cervical lesions among HIV positive women attending HIV/AIDS clinic at KIU Teaching Hospital.

3. To establish the factors influencing the uptake of cervical cancer screening services among HIV positive women attending the HIV/AIDS clinic at KIU Teaching Hospital.

1.4 Research Questions

1. What is the uptake rate of cervical cancer screening services amongst HIV positive women attending the HIV/AIDS clinic at KIU Teaching Hospital?

2. What is the prevalence of premalignant cervical lesions among HIV positive women attending HIV/AIDS clinic at KIU Teaching Hospital?

3. What are the factors influencing the uptake of cervical cancer screening services amongst HIV positive women attending the HIV/AIDS clinic at KIU Teaching Hospital?

1.5 Justification

Worldwide more than 530,000 women are diagnosed with cancer of the cervix annually and about half of these die of this disease (Bray et al., 2018). Almost 9 of every 10 of these cases occur in the poor countries especially in Sub-Saharan Africa. In Uganda, cancer of the cervix is the leading gynecological malignancy. These increasing cases of cervical cancer are attributed to the increased burden of HIV since they are more at risk (Wabinga et al., 2014).

Screening for premalignant cervical lesions is one of the most effective ways to reduce the morbidity and mortality due to cervical cancer. Yet still, only about a third of Ugandans have ever had at least one time screening for cervical cancer (Twinomujuni et al., 2015). It is therefore important to do cervical cancer screening as part of HIV/AIDS care.

Hence there is also need to study factors associated with uptake rate of screening services and prevalence of premalignant cervical lesions. This will guide in formulation of recommendations and protocols that will improve uptake of cervical cancer screening. If adequate cervical cancer screening is not done, a multitude of "high risk" women continue to go unscreened as most are from low socio-economic backgrounds. The incidence of cervical cancer will hence continue to rise with increased mortality and morbidity amongst this already immune-compromised population. No research in such a setting has been done in line with the objective to achieve every woman living with HIV get screened for cervical cancer.

1.6 Significance of the study

1.6.1 Importance to community

The study brought free cervical cancer screening services to the participants and also encouraged uptake during health education before data collection. This also helped to widen knowledge concerning cervical cancer screening in this population. The participants got to know their status and this helped in early diagnosis. Early diagnosis and appropriate treatment will empower the community by reducing the morbidity and mortality. Prompt referral to the appropriate department was made upon establishment of diagnosis for those with premalignant cervical lesions. Also, since cervical cancer screening is not offered for free at this institution, we hope to

recommend to the financiers of the HIV program to consider cervical cancer screening under the package hence benefiting the institution.

1.6.2 Contribution to science

Cervical cancer screening is one sure way of reducing the ever increasing burden of cervical cancer burden of morbidity and mortality. However, this is not being practiced in most developing countries due to many challenges and factors. The findings of this study will help to estimate the burden of premalignant cervical lesions in terms of prevalence and assess the factors that affect uptake of screening. The integration of cervical cancer screening services into HIV/AIDS care has contributed to great success for better health of women in an effort to achieve the sustainable development goals (SDGs). This research could also trigger further research relevant to the prevention and control of cervical cancer morbidity and mortality; hence further empowering the academia.

1.6.3 Contribution to policy

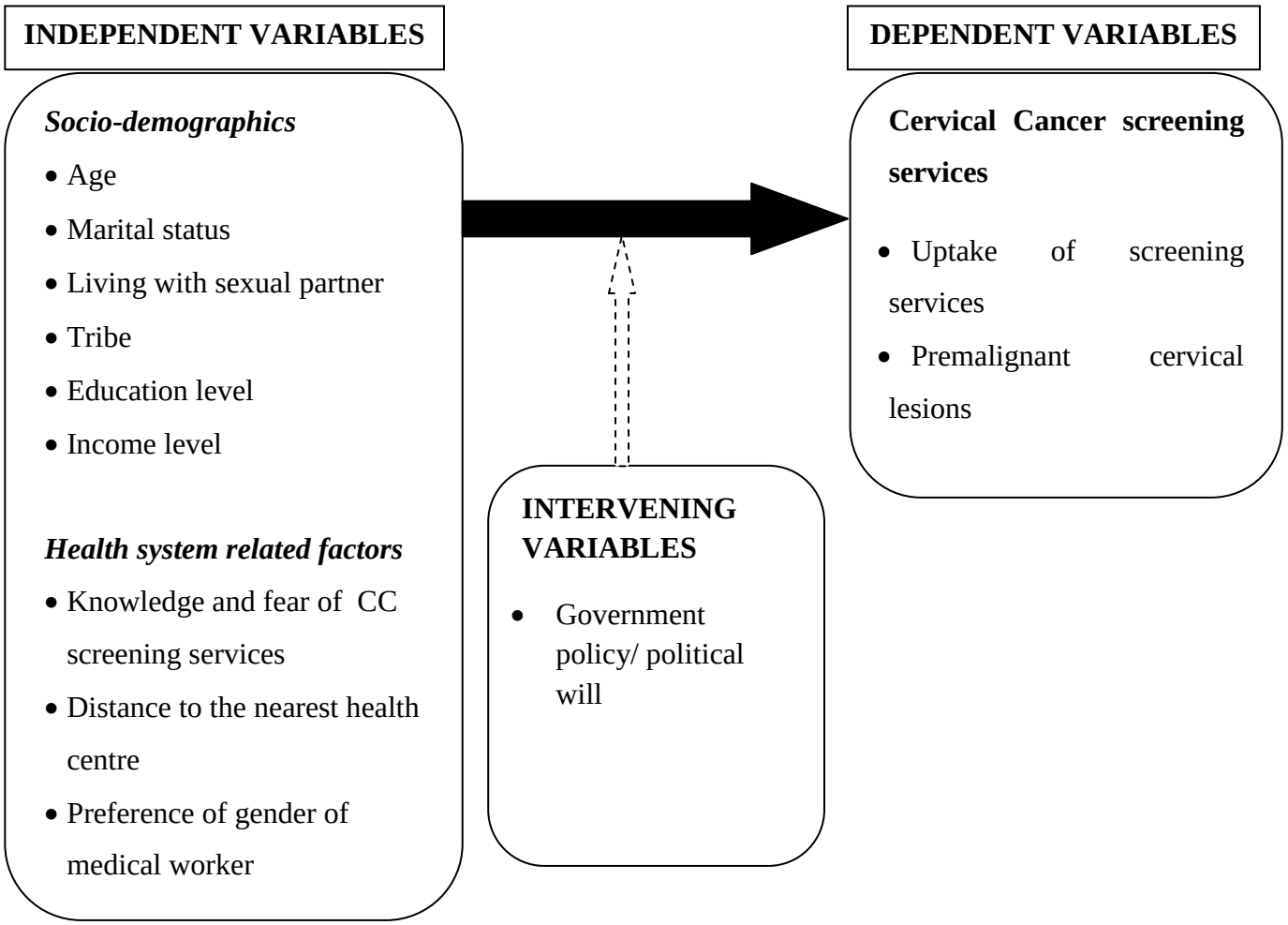
We hope that this will act as an eye opener for the hospital administration, stakeholders and government in designing further research and strategies to curb down the burden of cervical cancer especially in HIV/AIDS patients. It is also expected that recommendations could be made to enhance funding to cater for cervical cancer screening for free in the HIV clinic.

1.6.4 Contribution to theory

This research will also add to the knowledge about the theory of planned behavior. People's health seeking behavior; in this regard referring to seeking cervical cancer screening was further studied in this population of HIV infected women.

1.7 Conceptual framework

Figure 1: Conceptual framework



1.7.1 Description of conceptual framework

The diagram above depicts how the different variables are interrelated. The independent variables shown; which are mainly the individual characteristics of the study participant are thought or have been proven by previous research to directly affect the dependent variable (uptake). The intervening variables shown; which includes government policy on cervical cancer screening are also indirectly related to the independent variables which in turn affects the outcomes. We also aimed at assessing determining the outcome of screening; which is the prevalence of premalignant lesions.

1.8 Scope

1.8.1 Content Scope

This study focused on the uptake of cervical cancer screening, prevalence of premalignant cervical lesions and factors that influence uptake of cervical cancer screening among HIV positive women attending the HIV clinic at KIU-TH.

1.8.2 Geographical Scope

We conducted this study at Kampala International University Teaching Hospital in the HIV/AIDS clinic. The clinic serves clients from the areas of Bushenyi, Sheema, Rubirizi, Mitooma and other neighboring districts in western Uganda. Kampala International University Teaching Hospital (KIU-TH) which is located in Ishaka town. Ishaka is a municipality in Bushenyi district and is found in Igara County, Bushenyi District, approximately 62 kilometers (39 miles) West of Mbarara district in western Uganda.

1.8.3 Time Scope

The study was conducted during the months of October, November and early December of the year 2019.

Chapter Two

Literature Review

2.0 Introduction

This chapter presents relevant literature concerning Cervical Cancer and HIV. It has been presented as one objective after another. Cervical Cancer and HIV are strongly related in many aspects.

2.1 Uptake rate of cervical cancer screening services amongst women living with HIV

In a qualitative study, Cross, Suharwardy, Bodavula, Schechtman, Overton, Onen, *et al* (2014) analyzed a quality improvement intervention to increase cervical cancer screening rates in an urban academic HIV clinic and to identify factors associated with inadequate screening in Washington University in St. Louis Infectious Diseases clinic. They reported a multidisciplinary quality improvement intervention to improve cervical cancer screening coverage. The barriers to screening were identified by a multidisciplinary quality improvement committee and then strategies to address the barriers were developed. When these interventions were implemented, the coverage shot from 53% to 75.3% in the following year. It is therefore important to assess the uptake rate and then the factors that influence uptake for proper planning.

Vaccarella *et al* (2018) also did a population based survey to understand the preventable fractions of cervical cancer via effective screening in six Baltic, Central, and Eastern European countries for the next 25 years (2017–40). They found that screening for premalignant lesions of the cervix is still ineffective in some regions. In Europe, some countries also still lacked effective cervical cancer screening. They reported that there would be a projected continued increase in incidence rates compared to a 50-60% reduction by 2040 in the same countries if screening was introduced.

Most studies, however, have reported high acceptance and uptake rates of cervical cancer screening service by the HIV infected women. For example, Shiferaw *et al* (2016) carried out a study to review screening and treatment outcomes over nearly four years of project implementation and to identify lessons learned to improve cervical cancer prevention programs

in Ethiopia and other resource-constrained settings. They reported up to 99% uptake rate amongst 16,632 women with HIV who were counseled for screening. They analyzed aggregate client data for about four years of project implementation and visual inspection under acetic acid (VIA) was the model of screening used during the study. However, since patients were being offered treatment if found positive on screening, this could have encouraged uptake of the screening services in one way or another.

Nabukenya *et al* (2014) also reported their findings from a project implementation activity on Opt-out cervical cancer screening in HIV clinical care settings concerning their experiences on coverage. They shared experience from Mildmay Uganda clinic and this was a success story. They offered HIV/AIDS clinical care and decided to start screening of cervical cancer in 2008 using the opt-out approach. They also did an on-site "see and treat" model for those that qualified. The reported an overall refusal rate of less than five percent with an increased coverage in cervical cancer screening.

Mapanga, Elhakeem, Feresu, Maseko and Chipato (2017) did a systematic review of cervical cancer prevention modalities available for women living with HIV in developing countries. They reported a very low utilization of cervical cancer screening services in the developing countries. For example Twinomujuni *et al* (2015) studied the factors associated with intention to screen for cervical cancer among women of reproductive age in Masaka Uganda using the attitude, social influence and self-efficacy (ASE) model. It was a community-based survey and they reported that only Seven percent of the participants had ever had at least one episode of cervical cancer screening though majority (63%) showed intention to screen. This showed a very low screening rate for cervical cancer screening in Uganda even in the general population.

The available literature has showed that the uptake rates of screening still remain low especially in developing countries like Uganda. This is despite the high prevalence of premalignant cervical lesions. The factors that influence uptake of the screening services in the entirely HIV population have never been spelt out in any study in Uganda. Most of the published reports were as a result of compiled data from onsite work done not in a scientifically controlled environment.

2.2 Prevalence of Premalignant cervical lesions amongst HIV positive women.

Human Papilloma Virus (HPV) that causes cervical cancer; just like Human Immunodeficiency Virus (HIV); is spread by sexual intercourse with infected persons. About 12% of females and 14% of the males in Uganda report to have had sexual intercourse by the age of 15 years (Uganda Bureau of Statistics, 2016). This shows early exposure to HPV and high risk for HIV.

In a systematic review of 380 research papers by Finocchario-Kessler, Wexler, Maloba, Mabachi, Ndikum-Moffor & Bukusi (2016), on cervical cancer prevention and treatment research in Africa. It was found that several countries in Africa had little or no cervical cancer research ever conducted. It should also be acknowledged that research on HIV and cervical cancer is still taking shape and up to the year 2016, only about 11.3% of research on cervical cancer was amongst HIV infected women (Finocchario-Kessler et al., 2016).

World Health Organisation (2013) published guidelines for screening and treatment of precancerous lesions for cervical cancer prevention in 2013. In this brief, they noted that the incidence has worsened especially in the areas mostly affected by Human Immunodeficiency Virus (HIV) infection and cervical cancer is now considered an AIDS defining illness.

In a review, Franceschi & Jaffe (2007) analyzed cervical cancer screening in women infected with HIV. They argued that screening was a must in this era because HIV infected women are at higher risk than the general population. They also report a higher prevalence of premalignant cervical lesions amongst those living with HIV. Bray *et al* (2018) also studied global cancer estimates in GLOBOCAN (Global Initiative for Cancer Registry Development) for the year of 2018; a publication for the International Agency for Cancer Research (IARC) and reported that cervical cancer ranks as the fourth most frequently diagnosed and the fourth leading cause of cancer mortality in women globally. In 2018 alone, by September, more than 570,000 cases and 311,000 deaths had occurred worldwide. However, it is important to note that it ranks as number one in cancer related deaths in the developing countries especially in Sub-Saharan Africa and South East Asia. About two percent of all HIV positive women develop cervical cancer worldwide (Bray et al., 2018).

Ferlay *et al* (2015) studied estimates of global incidence and mortality for 36 cancers in 185 Countries and found that around 85% of the global burden of cervical cancer occurs in the low and middle income countries (LMICs), accounting for about 12% of all female cancers. According to GLOBOCAN 2012, there were an estimated 266,000 deaths from cervical cancer worldwide in 2012, accounting for 7.5% of all female cancer deaths. Almost nine in 10 (87%) cervical cancer related deaths were in LMICs. They also reported that average risk of dying from cervical cancer before age 75 is three times higher in LMICs than in the more high income countries (HICs). Shiferaw, Salvador-Davila, Kassahun, Brooks, Weldegebreal, Tilahun, *et al* (2016) did a study on the Single-Visit Approach as a cervical cancer prevention strategy among women with HIV in Ethiopia and reported that 10% of the HIV patients tested positive for precancerous lesions. In their study, they used VIA to do screening for premalignant lesions and offered treatment to those who turned positive. Their prevalence of the cervical lesions was much higher than in the general population.

In another study by Kohler, Tang, Gopal, Chinula, Hosseinipour, Liomba, *et al* (2016) on rates of cervical cancer among HIV-infected women at a referral hospital in Malawi, they documented almost similar results like in Ethiopia. The national guidelines of Malawi recommend screening of women aged 30-45 years every five years but they have no specific guidelines for HIV positive women. In their cross-sectional analytical study, they used electronic pathology results from 1037 specimen women who underwent cervical cytology (Pap smear), Loop Electrosurgical Excision Procedure (LEEP) or hysterectomy, cervical biopsy for diagnostic evaluation or treatment of suspicious cervical lesions. They also included all cervical, endometrial and uterine specimens collected during the period of November 2012 to November 2013. They found amongst them, 630 HIV positive women. Twelve percent had high-grade dysplasia and 109 women (17%) had cancer with the odds of having CIN2+ about 6.55 times (95% CI 4.44-9.67) greater for HIV+ women. There was strong association between HIV+ status and CIN2+ (Kohler et al., 2016).

Chambuso *et al* (2017) also studied the influence of HIV/AIDS on cervical cancer. This was a retrospective chart review in the HIV Clinic in Tanzania and they found that the prevalence of premalignant lesions was high in women with HIV and it was estimated that about 2% percent of

all HIV positive women develop cervical cancer worldwide. They reported that the prevalence of precancerous lesions was 71.8% in the women living with HIV. It was only 27.3% in the HIV-sero-negative women. The positive HIV status was highly statistically significant for cervical cancer screening positivity. They reported that the prevalence of extensive precancerous lesions was 40% in the HIV positive women and that of invasive cervical cancer was only eight percent. Wabinga *et al* (2014) also studied trends in incidence of cancer in Kampala, Uganda, between the years 1991 to 2010 according to the Kampala Cancer Registry. They found that cancer of the cervix has remained the most frequent in women and by 2010, the trend in incidence was still going up at about 1.8% per year. This was in relation to all other HIV related malignancies as they were also on the increase. However the access to Anti-Retroviral Therapy was becoming more available by then.

Bruni *et al* (2017) published a summary report on HPV and related diseases in Uganda. The report provides information on cervical cancer screening practices. It was also intended to strengthen the guidance for health policy implementation of primary and secondary cervical cancer prevention strategies in the country. They point out a high burden of cervical cancer and other HPV related diseases due to low screening rates in the region.

Gedefaw, Astatkie and Tessema (2013) studied the prevalence of and factors associated with precancerous cervical cancer lesion among HIV- infected women in southern Ethiopia. Out of the 448 study participants, 99 (22.1%) were found to be positive for precancerous cervical cancer using Visual inspection with Acetic Acid. This number is quiet comparable to the one found in Uganda by Mulumba *et al* (2018). Mulumba *et al* (2018) carried out a study to determine the prevalence and factors associated with cervical premalignant lesions in women attending the gynaecology clinic aged 25 to 65 years at Kampala International University Teaching Hospital. They reported a very high prevalence of premalignant cervical lesions estimated at 22% in the general population. Those with High Grade lesions were only about 13%. This study however did not assess for those who are HIV infected and had premalignant cervical lesions. They also did not assess for the factors that affect the uptake of screening services which are available at the institution.

The above literature also agrees that the prevalence of premalignant lesions is high especially in the HIV infected women. However, only limited research has been done in a purely HIV infected women especially in the highly burdened region of Sub-Saharan Africa. This also justifies the need for screening in lower health facilities with methods that have a shorter turn-over time in order to improve coverage and early diagnosis. The need to know the prevalence in the HIV population is also immense since it is unknown.

2.3 Factors influencing uptake of cervical cancer screening among HIV positive women

2.3.1 Socio-demographic factors influencing uptake of cervical cancer screening among HIV positive women

There's need to target the women of low socio-economic status as they are apparently at higher risk of developing cervical cancer World Health Organisation (2013). This is more complicated when it comes to the women living with HIV/AIDS. Sigfrid *et al* (2017) did a systematic review on integrating cervical cancer with HIV healthcare services in Africa. They enumerated several other factors that influence the uptake of cervical cancer screening like availability of treatment and transport costs. This is due to low income level. All in all, limited research concerning the socioeconomic factors that affect the uptake of cervical cancer screening services exists. The demographics of HIV infected women may also vary from the entire population characteristics. There is therefore, need to enumerate how these factors directly influence the uptake of screening. Leece *et al* (2010) also studied cervical cancer amongst HIV positive women in USA. This was a retrospective cohort study from a tertiary care HIV clinic in Ottawa. Most of the young ones were the ones likely to test for cervical cancer compared to the elderly. In fact, most (over 73%) of the women under 30 years of age had at least had one episode of cervical cancer screening in the last 3 years compared to less than 50% of those above 30 years of age. This could be attributed to poor health seeking behavior amongst the elderly women. However, this was a retrospective chart review at a tertiary HIV clinic.

Mukama, Ndejjo, Musabyimana, Halage and Musoke (2017) carried out a study to assess the knowledge and attitudes of Ugandan women about cervical cancer prevention with the aim of informing prevention and control interventions. They found that most of the women in urban areas had at least heard about cervical cancer screening compared to those from per-urban areas

(living in peri-urban areas (AOR = 1.62, 95% CI: 1.15 –2.28), urban areas (AOR = 3.64, 95% CI: 2.14 – 6.19)). This could be due to the availability of sources of information and level of education in the urban areas compared to the villages. Also having had an HIV test (AOR = 1.99, 95% CI: 1.34–2.96) and having a higher monthly income (AOR = 0.50, 95% CI: 0.37 – 0.68) were associated with level of knowledge on prevention of cervical cancer. They recommended that in order to increase uptake, there was need to scale up education about the same. Ebu and Ogah (2018) studied the predictors of intention to screen for cervical cancer amongst HIV positive women in Ghana. Their findings were more related to those of Mukama *et al* (2017).

Twinomujuni *et al* (2015) also carried out a community based survey to understand the low level of cervical cancer screening on women in Masaka in Central Uganda. Their findings were not very different. They also found out that decision by women also affects practice of cervical cancer screening. Many women (about one third) would have to consult someone before deciding to go for cervical cancer screening. Majority of those who discuss with their husband (>80%) are more likely to go for cervical cancer screening compared to those who do not. This therefore shows that social influence from important house-hold members such as the spouse plays a significant positive role in intention to screen for cervical cancer. There is therefore need to emphasize the need to increase male involvement in cervical cancer screening services because the lack of male involvement is reportedly prohibitive for successful health programs. This survey however did not assess for those who had HIV and did not study the prevalence of premalignant cervical lesions in the population.

Mulumba *et al* (2018) did a study at Kampala International University Teaching Hospital on women attending the gynaecology clinic, majority of the low socio-economic status women were less likely to have been screened for cervical cancer before. They were also less likely to test positive for premalignant cervical lesion. This shows how the socioeconomic status influences uptake of screening. In the same study, they found that age influences the likelihood of being screened for cervical cancer. They observed that the young population was more likely to test than the elderly. Though this could be associated to the income level, it cannot entirely explain this disparity in the two age groups. This, was, however in the general population and not in the HIV infected women only.

2.3.2 Health system related factors influencing uptake of cervical cancer screening among HIV positive women

According to World Health Organisation (2013), evidence exists that screening for premalignant cervical lesions reduces the burden, morbidity and mortality of cervical cancer. For example, over the last 30 years, the incidence has reduced by over 50% in the United States and this is attributed to screening alone ("Practice Bulletin No. 168: Cervical Cancer Screening and Prevention.," 2016). And for this reason, current guidelines recommend that HIV positive women receive screening tests at their baseline evaluations, then again at six months, and annually thereafter, if they have normal test results. These guidelines were also adopted by Uganda. ("Consolidated Guidelines for Prevention and Treatment of HIV in Uganda," 2018) though the Government has allocated limited resources to prevention of cervical cancer and this has continued to be a burden.

Gakidou, Nordhagen, & Obermeyer (2008) carried out a survey on the coverage of cervical cancer screening in 57 countries. They highlighted a low level average and large inequalities between the different countries' health systems. They also reported that coverage of cervical cancer screening in developing countries was on average 19%, compared to 63% in developed countries, and ranged from 1% in Bangladesh to 73% in Brazil. Sigfrid *et al* (2017) also carried out a systematic review on integrating cervical cancer with HIV health care services in Africa. They documented a number of factors affecting the integration of these two services. Hospital related barriers like long time to wait for treatment, long distances and lack of time discourage practice of cervical cancer screening influence screening for cervical cancer. Other challenges included lack of adequate staff and skilled staff, lack of pathologists, staff fatigue, high staff turnover and lack of motivation and financial incentives to providers. High loss to follow up to further care also limited other chain management and logistical support. Other facilitator factors included single-visit approach (see-and-treat), low cost of screening and transport, integration with in pre-existing infrastructure and stake holder involvement and community participation and health promotion targeting patients and workers. Poor access to cervical cancer screening services also resulted in the low cytological screening coverage rates in Africa.

Horo, Suharwardy, Bodavula, Schechtman, Overton, Onen, *et al* (2012) also studied cervical cancer screening by visual inspection in Côte d'Ivoire on the operational and clinical aspects according to HIV status. They identified that some challenges could be solved systematically. For example loss to follow up could be reduced through phone call tracking and this has been shown to be effective to a greater extent. Shiferaw *et al* (2016) studied the Single-Visit Approach as a cervical cancer prevention strategy among women with HIV in Ethiopia and noted that availability of treatment services at the site was shown to encourage clients to test for cervical cancer since they are sure of obtaining treatment if diagnosed with cancer. They were doing a single visit approach and they had a high acceptance rate as the patients found positive were being treated on site immediately. About 10% of their clients tested positive by VIA and 97% of these received cryotherapy. Shiferaw *et al* (2016) also noted that human resource greatly affects services. For example task shifting, staff willingness, continuous education and training, and capacity building for healthcare workers contributed to coverage of screening services.

Lovgren, Soliman, Ngoma, Kahesa and Meza (2017) studied the geographic distribution of HIV positive women diagnosed with cervical cancer in Tanzania. One of the findings was that there was low utilization of screening services by women who stayed far away from the hospital and this was mainly the women from rural areas. This is in relation to other studies.

Leece *et al* (2010) conducted a retrospective chart review to determine the rate of cervical screening of women with HIV at a tertiary care clinic. The 3-year cervical screening rate for HIV-positive women was 58% and was lower than other reports in the literature. In this study, 33% of HIV-positive women had at least one abnormal test result during the study period, whereas the rate of abnormal results among all women in Ontario in 2003 was 4.5%. They found a significant relationship between having a low recent CD4 cell count (< 200 cells/μL) and having one or more abnormal test results (P=.04) (Leece et al., 2010).

Most of the available literature points out some of the health care related factors and do not point out the health system related factors that affect uptake by the population from a patients perspective. New strategies facilitate screening in resource-limited settings. An organized effective prevention and control program requires adequate resources and finances. It needs manpower and infrastructure. It is necessary to have surveillance mechanisms of the targeted

women with education and sensitization with monitoring and evaluation mechanisms for effectiveness. Uganda lacks a National Cervical Cancer screening and control program and many other prevention and treatment activities need coordination. This requires political will and dedication.

Chapter Three

Materials and Methods

3.1 Study design

This was a descriptive cross-sectional study whereby the sampling of respondents for data collection was done at a single point in time.

3.2 Study setting

The study was done in the HIV/AIDS clinic at Kampala International University Teaching Hospital (KIU-TH) which is located in Ishaka town. Ishaka is a division in Bushenyi-Ishaka municipality in Bushenyi district, approximately 62 kilometers (39 miles) West of Mbarara Municipality in western Uganda. Kampala International University Teaching Hospital HIV/AIDS clinic has about 1000 adult clients who are enrolled on Antiretroviral Therapy (ART) with about 600 clients being female. All these are active regular attendees of the clinic on appointment. Testing and counseling is done daily and about eight (8) new clients are enrolled on HAART weekly on a regular basis.

The clinic operates daily but with two major days for appointment every week, that is; every Monday and Tuesday. On each day, about 80 clients are reviewed in the clinic. There is also a special clinic day for pregnant and lactating clients. This is conducted every last Tuesday of the month with an average of 60 clients per day. KIU-TH is a private hospital but the clinic provides free HIV/AIDS services and is funded by the government of Uganda under the public-private partnership program. The HIV/AIDS clinic has two doctors. They review patients and also head this particular department in the hospital. The other staffs in this clinic include one clinical officer, one nursing officer and seven counselors.

Human Immunodeficiency Virus positive women who tested positive by VIA were directed to the gynaecology department for follow-up and treatment. The obstetrics and gynaecology department has an antenatal clinic, a gynaecology out-patient clinic and a ward that caters for both obstetric cases and gynaecology cases. The ward has a seventy five bed capacity and has a

theatre for emergency obstetric cases like cesarean sections and ectopic pregnancies. For gynecological emergencies, there is a major theatre which can be accessed any time.

3.3 Population

3.3.1 Target population

All women with HIV/AIDS in the catchment area of KIU Teaching Hospital HIV/AIDS clinic aged 25 to 49 years.

3.3.2 Accessible population

All HIV/AIDS infected women who presented to the HIV clinic of KIU TH during the period of the study.

3.3.3 Study population

All HIV/AIDS infected women who presented to the HIV clinic of KIU TH during the period of the study and accept to consent for the study.

3.4 Sampling technique

Consecutive sampling was done. The HIV clinic has eight (8) clinic days per month and attends to an average of 80 clients per day. On each day, we recruited 15 clients. The recruitment was done as the clients reported to the clinic before they received their routine services of the antiretroviral therapy. This has been described in detail under data collection procedure and patient flow chart (Section 3.8.3, figure 2).

3.5 Sample size

The total number of respondents interviewed was determined objectively by taking the highest sample size of the three objectives as follows;

Specific Objective 1: Using the formula below (Kish, 1965);

$$n = \frac{(z_\alpha)^2 x\ px\ (1-p)}{e^2}$$

Where:

N = Desired Sample size for a population greater than 10,000.

Z = 1.96 i.e. Standard normal deviation. Z is the level of significance in Z scores (assuming a 95% confidence interval)

p = 0.718 i.e. the estimated prevalence of cervical premalignant lesions. We used 71.8% which is the prevalence obtained in a more recent study in a similar (HIV) population at a Regional referral hospital in Tanzania (Chambuso et al., 2017).

q = 1-**p**, therefore **q** = 0.781

e = 0.05 is the absolute precision (taking 95% confidence interval)

Therefore **N** = $\frac{1.96^2 \times 0.718 \times 0.282}{0.05^2}$

Therefore sample size is 312 respondents

Specific Objective 2: In one study, the uptake rate of cervical cancer screening in the HIV population was estimated at 99% (Shiferaw et al., 2016);

Using the Daniel formula (Daniel, 1999);

$N_2 = 1.96^2$ X 0.99X0.01 ÷ 0.05^2 = 16 Respondents.

Specific Objective 3: For associated factors; Using the prevalence of premalignant lesions at KIU Teaching Hospital as 22% (Mulumba et al., 2018)

Using the modified Daniel formula (Daniel, 1999)

$$n = \frac{(z_\alpha + z_\beta)^2 x \frac{1}{R}\ px\ (1-p)}{e^2}$$

Where:

Z = Standard normal deviate at 95% level of confidence; z= 1.96

Z_α= z-statistic at α=1.96, Z_β = z-statistic at β=0.84

p = 22%

e = level of precision (in proportion of one, if 5% e=0.05)

N_3 = Desired sample size

R = Odds ratio=2.0

$N_3 = [(1.96+0.84)^2 \text{ x } (1/2)0.22\ (1-0.22)] \div 0.05^2 = 304$ Respondents

Therefore, we took the minimum number of respondents using objective 1 above since it had the maximum respondents.

We DID NOT expect non-response since it is not a follow up study**.**

However, for a finite population (the number of patients in the HIV clinic at the time was known), we adjusted using the formula of Finite Population Correction factor (Lavrakas, 2008);

$$\boldsymbol{n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}}$$

Where;

n_0 - the initial sample size = 312

n - Adjusted sample size

N - The population size = 600 women registered in the HIV clinic at KIU TH

Hence n = 312 / [1+ (312-1)/600)]

n = 206 participants

Therefore, we recruited 206 participants for this study.

3.6. Eligibility criteria

3.6.1 Inclusion criteria

All women with HIV/AIDS on Highly Active Antiretroviral Therapy (HAART) aged 25 to 49 years attending KIU-TH HIV clinic. Women who consented to VIA were eligible. The age range for routine screening for cervical cancer screening using Visual Inspection under Acetic acid is 25-49 years as recommended by World Health Organisation (2013).

3.6.2 Exclusion criteria

Patients with confirmed cervical cancer or presented evidence that they had cervical cancer screening in the last one year were excluded. Those who were pregnant, puerperium or breast feeding were also excluded.

3.7 Data collection methods and instruments

We conducted interviews using a semi-structured interviewer administered questionnaire as a guide to conduct individual interviews. We also used a speculum and acetic acid to visually inspect the cervix during cervical cancer screening. The questionnaire assessed the socio-demographic and health system related factors of the participants that determine uptake (Objective 3).

3.7.1 Validity of data collection instrument

Content Validity Index was used. This involved getting five participants who were not part of the sample population and were given the questionnaire. The inter-participant agreement was then measured. The agreement of more than 70% was the measure that the items of the questionnaire would give us the required information of factors influencing uptake rate of cervical cancer screening.

3.7.2 Reliability of data collection instrument

By using the Cronbach's coefficient alpha, a value of more than 0.8 was taken to indicate that items of the questionnaire are reproducible and consistent.

3.8 Data collection Procedure

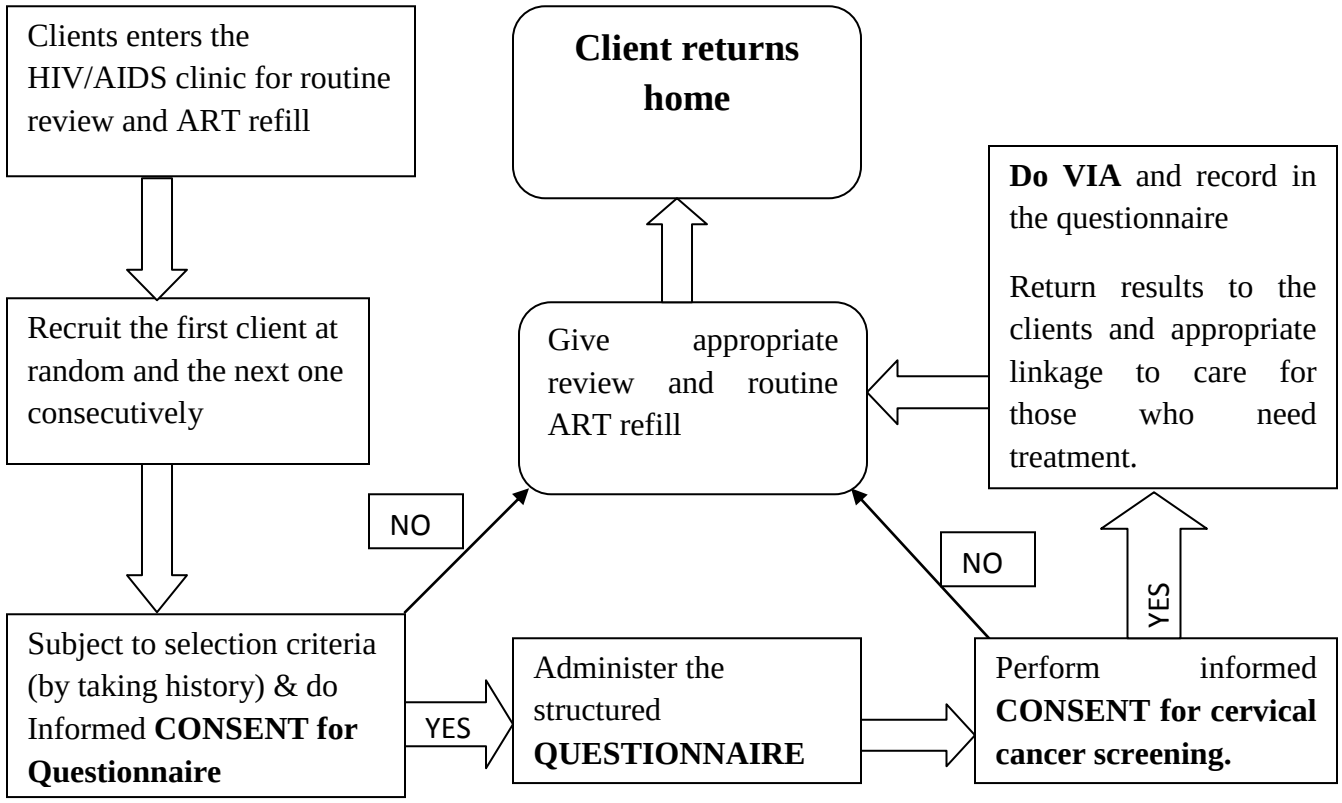
3.8.1 Interviews

The participants who met the inclusion criteria (done by taking history) were put aside in a place designated for the study in the Anti-Retroviral Therapy (ART) clinic for individual interviews. These were counseled individually and educated about the study. Interpretation to the local language was always used where necessary. Those who accepted would sign Part 1 of the consent form. Data was collected using a semi-structured questionnaire which was developed and pretested for this study. The questionnaire was administered to the study participants by the principal investigator who in turn filled-in during the individual interviews. After, they were checked for completeness and filed safely.

3.8.2 Cervical cancer screening Procedure

Then those who accepted to be screened for cervical cancer signed Part 2 of the consent form (Objective 1). Consent was obtained by the principal investigator who in turn performed the cervical cancer screening in consultation with the supervisors (Gynecologists). Then, speculum vaginal examination to visualize the cervix was done. A cotton swab soaked in Acetic acid (5%) on a sponge holding forceps would then be inserted at the cervix and held in place for one minute. The cervix would then be inspected for "aceto-whitenning". The details of the procedure are described in appendix 4. The results would then be filled into the respective questionnaire. These would be used to calculate the prevalence of premalignant cervical lesions (Objective 2).

Figure 2: Description of study Procedure and patient flow during the days of data collection.



3.8.3 Description of patient flow during data collection and data collection procedure

Clients would walk into the HIV/AIDS clinic routinely like on any clinic day visit. We were stationed in the clinic waiting for the clients and the first study participant would be selected at random in the morning. Thereafter, the next participant would be selected consecutively and the series continued. Focused history would then be taken to satisfy the selection criteria. These would be subjected to informed consent individually as they were recruited. Those who refused to consent would be given their routine service at the HIV/AIDS clinic and allowed to return home. Those who accepted to consent would be subjected to a structured questionnaire by the coordinator. Thereafter, consent for screening would be done (appendix 1) and screening performed (Appendix 4) for those who accepted to be screened. Those who refused would be given their routine service at the clinic and allowed to return home. After screening, the clients would receive their results and then be given their routine services and allowed to return home. Those with abnormal results would be linked for appropriate management and/or referral

recommended and linkage to the Gynaecology department where care would be done or to a hospital of their choice since the cost of treatment was to be catered by themselves.

3.9 Quality control

We adhered to the inclusion and exclusion criteria and we followed the standardized questionnaire for all participants.

Questionnaires were printed and pretested at KIU Teaching Hospital to ensure reliability and validity**.** We ensured that questionnaires are filled correctly by allowing enough time for response and filling.

We also explained unfamiliar technical terms to the participants consistently. Questionnaires were also translated to the local language for easy understanding. For data completeness, the questionnaires would be checked just after filling before they were taken for data entry and analysis.

Cervical cancer screening was performed only by the principal Investigator who was fully trained for this procedure. On some occasions, we involved a specialist in cervical cancer screening (supervisors who are gynecologists) to crosscheck some of the patients to ensure quality.

3.10 Data management

Completed questionnaires were checked and protected safely in water proof bags. They were kept away from non-members of the research. Data was then coded and entered into a database created using Microsoft Excel (2010) then cleaned and edited. Dataset was then imported into STATA 14 (Statacorp, Lakeway Drive, USA Texas) for analysis.

3.11 Data analysis plan and Presentation

Socio-demographic characteristics: Frequencies (for categorical variables) and; means (standard deviation) for age as a continuous variable were used and presented in a table.

Clinical characteristics: Frequencies as categorical variables and presented in a table.

Objective 1: The uptake rate was summarized as a percentage of those who accept to be screened to the total number of patients who took part in the study. It was then presented using a pie chart.

Objective 2: The prevalence of premalignant cervical lesions was summarized as frequencies and percentages with numerator being those who had positive VIA and denominator being the total number of women who consented to screening. It was then presented using a bar graph.

Objective 3: The factors associated with uptake of cervical cancer screening were assessed using a chi square test and then logistic regression. Frequencies, percentages, Odds ratios, 95% confidence intervals and p-values were presented. Factors with *p*-value ≤0.05 and those with biological plausibility were considered and carried forward for multivariate analysis model. The measure of association was reported as adjusted Odds ratios (aOR) with corresponding 95% Confidence Interval and *p*-value.

3.12 Ethical considerations

3.12.1 Informed consent and autonomy for participants

Voluntary recruitment was done and an informed consent was signed. Informed consent from participants was obtained after fully explaining the details of the study to them in English and local languages (copy attached at appendix I). Participants were not coerced to enroll themselves if they did not want to. Participants were allowed to withdraw from the study at any time as they wished without coercion or compromise of care they are entitled to.

3.12.2 Risks and adverse events to study participants

Participants may undergo mild discomfort during the screening procedure. However, the process was done gently and professionally to minimize risk of discomfort as much as possible.

3.12.3 Benefits of the research

The participants who accepted had cervical cancer screening done for them for free. The participants who were suspected or found to have vaginal infections like cervicitis or candidiasis during examination were linked to the gynaecology clinic for treatment immediately. Prompt

referral to the gynaecology department or to a hospital of their choice was also made upon establishment of diagnosis for those with premalignant cervical lesions. The community will also benefit after dissemination of the research findings. These findings will significantly play a key role in designing the best model for cervical cancer screening in the HIV infected population and considerations to be made for effectiveness.

3.12.4 Privacy and confidentiality

Identification of participants was done by means of numerical codes. Details of respondents were kept under lock and key for privacy and confidentiality purposes throughout the course of research. Respect of the respondents' rights and fair treatment was strictly adhered to thus minimizing harm and discomfort to them. There was no disclosure of participants' names to the public and all identities will be removed from the results before publication.

3.12.5 Selection of participants

Random sampling method was used to select participants to ensure equal chance of being selected for the study. Eligibility criteria were strictly adhered to. No bias was made in terms of tribe, interest group, race or religion.

3.12.6 Incentives and reimbursement

No monetary or any other form of incentives was offered to the participants. However, all participants were offered refreshments (a drink and cake) since the study delayed them at the clinic than in the usual routine clinic visit.

3.12.7 Approval Procedure

Approval to carry out the study was sought from the department of obstetrics and gynaecology, the faculty and post graduate directorate and finally the Kampala International University Research Ethics Committee (KIU-REC). After approval by the KIU-REC, the study was registered with the Uganda National Council for Science and Technology (UNCST). The clearance was presented to the hospital administration of Kampala International University Teaching Hospital prior to data collection to acquire permission to proceed with the study at the HIV Clinic.

3.12.8 Respect for community

The procedures involved in this study did not go against the local community beliefs, traditions and culture. The findings from the study were communicated to the head of Obstetrics and Gynaecology department of Kampala International University Teaching Hospital as a formal feedback as well as office of District Health Officer, Bushenyi district so that the community can benefit from it. The participants were also told their results and those who needed further care were linked appropriately.

3.13 Dissemination

The final outcomes of this research were shared with KIU teaching hospital including the HIV Clinic, district authorities, ministry of health and other stake holders who are involved in the fight of Cervical Cancer. We shall also publish a copy in a peer reviewed journal for the academia (in progress).

3.14 Study limitations and de-limitations

This population is also a sensitive group in society. This may lead to withholding information due to stigma. We, however, had a professional counselor in handling these HIV clients to assist in counseling to avoid this limitation.

Chapter Four

Results

4.0 Study Profile

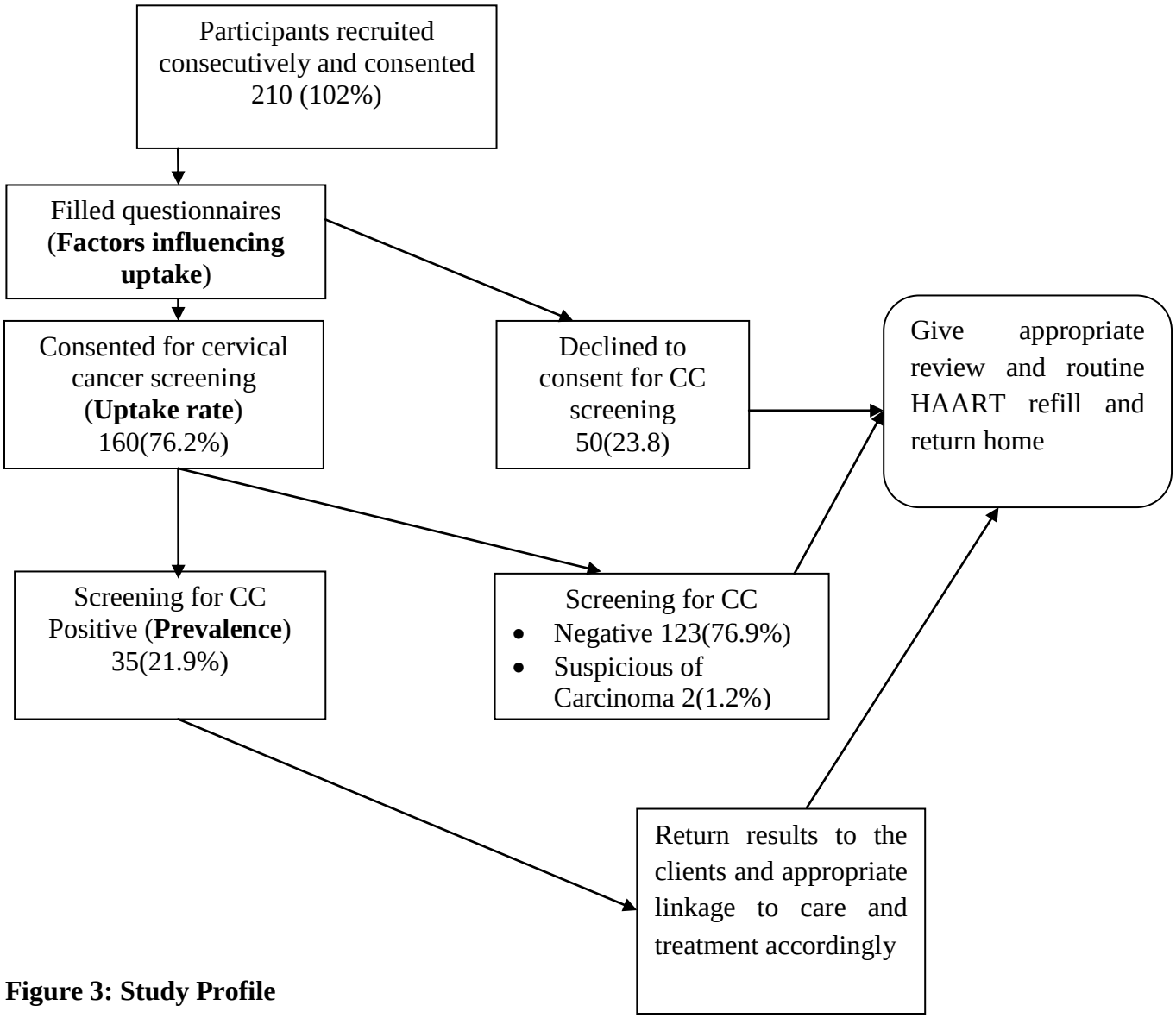


Figure 3: Study Profile

4.1 Socio-demographic Characteristics of Study Population

The socio-demographic characteristics of 210 HIV positive women aged 25-49 years attending KIU-TH HIV clinic were obtained for variables of interest as indicated in Table 1.

Table 1: Socio-demographic characteristics of study population (N = 210)

Variable	Overall (n=210)	Percent
Age (Mean = 37.6, SD = 7.52)		
<30 years	37	17.6
30-49 years	173	82.4
Marital status		
Single	12	5.7
Married	151	71.9
Divorced	33	15.7
Widowed	14	6.67
Living with sexual partner		
No	61	29.0
Yes	149	71.0
Level of education		
None	24	11.4
Primary	100	47.6
Secondary	60	28.6
Tertiary	26	12.4
Tribe		
Munyankole	174	82.8
Mukiga	22	10.5
Muganda	12	5.7
Other	2	1.0
Income in UGX		
<120,000	157	74.7
120,000-500,000	44	21.0
>500,000	9	4.3
Parity		
0	8	3.8
1 to 5	129	61.4
>5	73	34.8

Table 1 shows that of the 210 HIV-positive women attending the KIU-TH HIV clinic between October, November and early December of 2019, their mean age of the was 37.6 years (*SD* = 7.52). Majority were married, 151(71.9%) and living with sexual partner, 149(71.0%). Most of the study participants earned < 120,000 UgX.

4.2 Clinical characteristics of the study participants

Table 2: Clinical characteristics of the study participants

Characteristic	**Frequency**	**Percent**
Duration spent on HAART (n = 210)		
<1/2 year	9	4.3
1/2 -1 year	13	6.2
1-<5years	26	12.4
>5 years	162	77.1
Recent Viral Load (n=201)*		
Suppressed	184	91.5
Non-suppressed	17	8.5

*Note that Nine (9) participants had not had any viral load test since they had not yet spent six (6) months on HAART (viral load is done for the first time after 6 months of HAART)

Table 2 shows that of the 210, HIV-positive women attending the KIU-TH HIV clinic, majority (162, 77.1%) had spent more than five (5) years on HAART and most of the study participants had viral load suppression in the most recent viral load testing, 184(91.5%).

4.3 Uptake rate of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

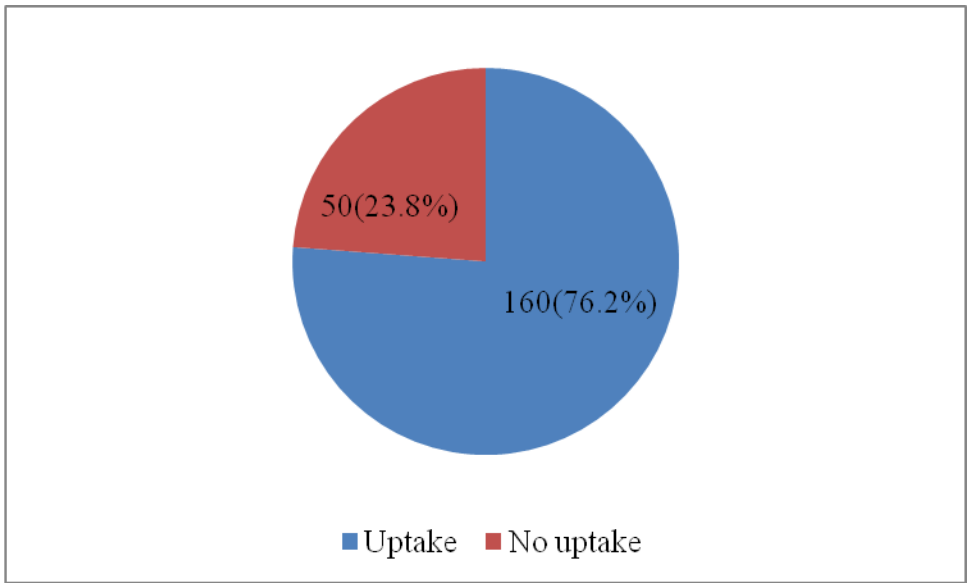


Figure 4: Uptake rate of cervical cancer screening services amongst women attending the HIV/AIDS clinic at KIU-TH

Figure 4 shows that of the 210 HIV positive women enrolled, there was an uptake rate of cervical cancer screening of 160 (76.2%).

4.4 Prevalence of premalignant cervical lesions amongst women attending the HIV/AIDS clinic at KIU Teaching Hospital

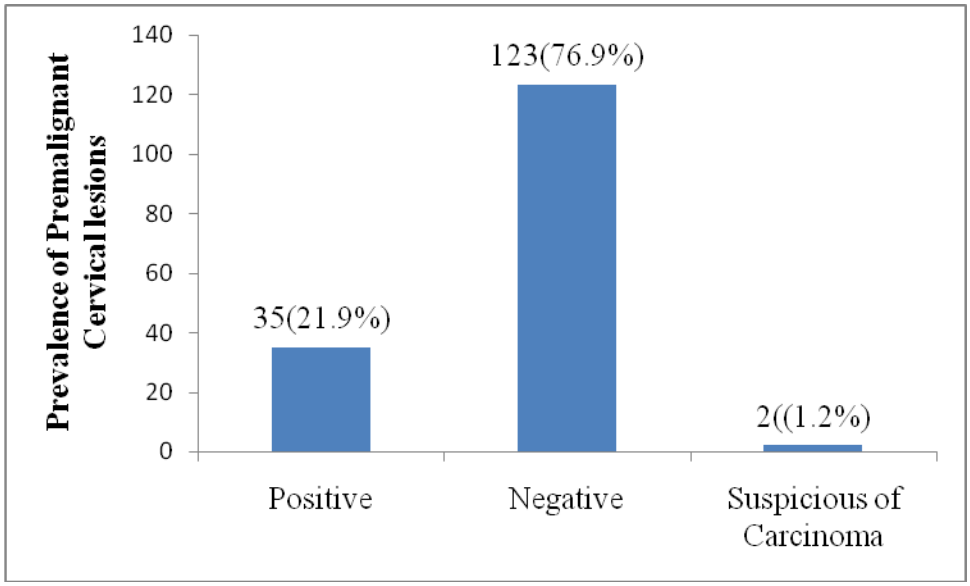


Figure 5: Prevalence of premalignant cervical lesions amongst women attending the HIV/AIDS clinic at KIU Teaching Hospital

Figure 5 shows that of the 210 HIV positive women enrolled, the prevalence of premalignant cervical lesions was 35 (21.9%).

4.5 Factors influencing the uptake of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

4.5.1 Bivariate analysis of the socio-demographic factors influencing the uptake of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

Table 3: Bivariate analysis of socio-demographic factors influencing the uptake of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

Variable	Overall (N=210)	Uptake (n=160)	OR (95% CI)	*P*
Age in years				
>40	87 (41.4)	70 (43.8)	1.0	
30-39	86 (41.0)	65 (40.6)	0.9(0.80-1.10)	0.44
≤ 29	37(17.6)	25 (15.6)	0.8(0.66-1.08)	0.17
Marital Status				
Single	12(5.7)	5(3.1)	1.0	
Married	151(71.9)	117(73.1)	3.1(0.88-10.61)	0.08
Divorced	33(15.7)	25(17.5)	3.7(1.07-12.51)	**0.04***
Widowed	14(6.7)	10(6.3)	9.1(1.19-13.48)	**0.02***
Living with sexual partner				
No	61(29.1)	43(26.9)	1.00	
Yes	149(70.9)	117(33.1)	1.1(0.93-1.34)	0.25
Level of education				
None	24(11.4)	21(13.1)	1.00	
ORimary	100(47.6)	80(50.0)	0.9(0.76-1.10)	0.33
Secondary	60(28.6)	38(23.8)	0.7(0.57-0.93)	**0.01***
Tertiary	26(12.5)	21(13.1)	0.9(0.73-1.18)	0.52
Tribe				
Munyankole	174(82.9)	131(81.9)	1.00	
Mukiga	22(10.5)	18(11.3)	1.1(0.88-1.35)	0.45
Muganda	12(5.7)	10(6.2)	1.1(0.85-1.45)	0.46
Others	2(0.9)	1(0.6)	0.7(0.17-2.67)	0.56

*p<0.05

Independent socio-demographic factors with p-values <0.05 and those with biological plausibility were considered to have a profound influence on the uptake of cervical cancer screening services among HIV women attending HIV/AIDS clinic at KIU-TH and were considered in the multivariate model. These included marital status and level of education.

4.5.2 Bivariate analysis health system related factors influencing the uptake of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

Table 4: Bivariate analysis of health system related factors influencing the uptake of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

Variable	Overall (N=210)	Uptake (n=160)	OR (95% CI)	*P*
Distance to nearest health centre				
Walkable	170(81.0)	141(88.1)	1.0	
Use boda boda	29(13.8)	15(9.4)	0.6(0.44-0.89)	**0.01***
Use vehicle	11(5.2)	4(2.5)	0.4(0.2-0.96)	**0.04***
Knowledge				
Ever heard about cervical cancer				
No	34(16.2)	28(17.5)	1.0	
Yes	176(83.8)	132(82.5)	0.9(0.76-1.09)	0.30
Fear being diagnosed with cervical cancer				
No	166(79.0)	146(91.3)	1.0	
Yes	44(21.0)	14(8.7)	0.4(0.23-0.56)	**0.01***
Preference of medical worker gender				
Male	31(14.8)	8(5.0)	1.0	
Female	15(7.1)	13(8.1)	3.4(1.79-6.31)	**0.01***
Either	164(78.10)	139(86.9)	3.3(1.80-6.00)	**0.01***
History of screening for cervical cancer				
No	187(89.1)	146(91.2)	1.0	
Yes	23(10.9)	14(8.8)	0.8(0.56-1.09)	0.14

*p<0.05

Key:

- Walkable – distance to nearest health centre is near and the client can walk easily
- Use bodaboda - distance to nearest health centre is relatively far and the client has to use a bodaboda to reach there.
- Use vehicle - distance to nearest health centre is far and the client has to use a vehicle.

Table 4 shows that Health system related factors that include distance to the nearest health centre, fear of being diagnosed with cervical cancer and preference of the health worker's gender indicated *p*-values < 0.05 and were considered to have a profound influence on the uptake of cervical cancer screening services among HIV women attending HIV/AIDS clinic at KIU-TH and thus were considered in the multivariate model.

4.5.3 Multivariate analysis of the factors influencing the uptake of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

Table 5: Multivariate analysis of the factors influencing the uptake of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

Variable	aOR (95% CI)	*P*
Marital status		
Single	1.0	
Married	1.2(0.85-1.81)	0.25
Divorced	1.4(0.94-2.04)	0.10
Widowed	1.2(0.78-1.71)	0.46
Level of education		
None	1.0	
Primary	0.8(0.71-0.96)	**0.02***
Secondary	0.8(0.61-0.91)	**0.01***
Tertiary	0.9(0.75-1.12)	0.39
Distance to nearest health centre		
Near and walkable	1.0	
Far-uses a bodaboda	0.9(0.70-1.10)	0.26
Far-uses a vehicle	0.5(0.26-0.89)	**0.02***
Heard about cervical cancer screening		
No	1.0	
Yes	1.0(0.83-1.08)	0.43
Fear of being diagnosed with cervical cancer		
No	1.0	
Yes	0.4(0.29-0.67)	**0.01***
Preference of health worker's gender		
Male	1.0	
Female	2.9(1.59-5.34)	**0.01***
Either	2.7(1.52-4.92)	**0.01***

*p<0.05

Table 5 shows that of the 210 women recruited, women with primary education (aOR = 0.8, 95% CI: 0.71-0.96, p = 0.02) and secondary education (aOR = 0.8, 95% CI: 0.61-0.91, p = 0.01) showed a lower statistical likelihood of uptake. Women who came far from the health centre and had to use a vehicle also showed a lower likelihood of uptake (aOR = 0.5, 95%CI: 0.26-0.89, p = 0.02). Fear of being diagnosed with cervical cancer also led to a lower likelihood of uptake (aOR = 0.4, 95% CI: 0.29-0.67, p = 0.01). Preference of the health workers' female gender (aOR = 2.9, 95% CI: 1.59-0.5.34, p = 0.01) and either gender (aOR = 2.7, 95% CI: 1.52-4.92, p = 0.01) was associated with a higher likelihood of uptake of cervical cancer screening services.

Chapter Five

Discussion, Conclusions and Recommendations

5.1 Discussion of the Findings

5.1.1 Uptake rate of cervical cancer screening services amongst women attending the HIV/AIDS clinic at KIU Teaching Hospital

In assessing the uptake rate of cervical cancer screening services amongst HIV positive women attending the HIV/AIDS clinic at Kampala International University Teaching Hospital (KIU-TH), we found out that in a total 210 women, an overall uptake of cervical cancer screening services was 76.2%. This referred to the percentage of women who accepted to be screened for cervical cancer from all who accepted to fill the questionnaire. This finding shows an almost similar uptake rate of cervical cancer screening services compared to that reported by Cross, Suharwardy, Bodavula, Schechtman, Overton, Onen, *et al.,* (2014) in a study to assess quality improvement intervention to increase cervical cancer screening rates in an urban academic HIV clinic in Washington University in St. Louis Infectious Diseases clinic in which interventions implemented increased the coverage from 53% to 75.3% in the following year.

Contrary, Twinomujuni *et al* (2015) reported a lower uptake rate of cervical cancer screening services at 63% among women of reproductive age in Masaka, Uganda. The difference was attributed to Twinomujuni *et al* (2015) conducting a community-based survey as opposed to a hospital based study in our case. Leece *et al* (2010) also conducted a retrospective chart review to determine the rate of cervical screening of women with HIV at a tertiary HIV care clinic. The 3-year cervical cancer screening rate for HIV-positive women was 58%. This was also lower compared to our findings. However, in their study, they did a retrospective review over a 3 year period.

However, Shiferaw *et al* (2016) in Ethiopia reported a much higher uptake rate of cervical cancer screening services (99%) amongst 16,632 women with HIV. The difference is attributed to prior counseling and treatment offers if found positive on screening. Similarly, Mapanga, Elhakeem, Feresu, Maseko and Chipato (2017) in a systematic review of cervical cancer prevention modalities available for women living with HIV in developing countries, there was a very low

utilization of cervical cancer screening services in the developing countries. It was therefore important to assess the uptake rate of screening services. The relatively lower uptake in our study could be due to the absence of treatment services concurrently with screening. Nabukenya *et al* (2014) also reported a very high uptake rate of screening services with an overall refusal rate of less than five percent. This was in a community based survey by Mildmay Uganda.

5.1.2 Prevalence of Premalignant cervical lesions amongst HIV positive women attending the HIV/AIDS clinic at KIU Teaching Hospital

In this study we determined the prevalence of premalignant lesions amongst women attending the HIV/AIDS clinic at KIU-TH and found that of the 160 HIV positive women enrolled who underwent Visual Inspection under Acetic acid, 21.9% were positive for premalignant lesions. This is similar to Mulumba *et al* (2018)'s report at KIU-TH who indicated a close prevalence of 22% among women of similar age range attending the gynaecology clinic. However this was not done amongst HIV positive women but rather the entire population attending the gynaecology clinic. Also, Gedefaw, Astatkie and Tessema (2013) in southern Ethiopia indicated a close prevalence (22.1%) among HIV positive women.

Contrary, Wabinga *et al* (2014) earlier reported a much higher prevalence of precancerous lesions at 40% in the HIV positive women. The difference was attributed to our study considering primary data from women while Wabinga *et al* (2014) depended on the Kampala Cancer Registry between the years 1991 to 2010. Additionally, Chambuso *et al* (2017) in a retrospective review in the HIV Clinic in Tanzania found that the prevalence of premalignant lesions very high at 71.8% in the women living with HIV. Therefore, there is a disproportionate prevalence of premalignant lesions amongst HIV positive women attending the HIV/AIDS clinic across countries.

On the other hand, some have reported a lower prevalence. For example, Shiferaw, Salvador-Davila, Kassahun, Brooks, Weldegebreal, Tilahun, *et al.* (2016) also reported a prevalence of 10%. They did a study on the Single-Visit Approach as a cervical cancer prevention strategy among women with HIV in Ethiopia and reported that 10% of the HIV patients tested positive for precancerous lesions. In their study, they used VIA to do screening for premalignant lesions and offered treatment to those who turned positive. Their prevalence of the cervical lesions was

much higher than in the general population in Ethiopia though. This could be attributed to the different levels of coverage of Anti-retroviral therapy across the region.

5.1.3 Factors influencing the uptake rate of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital

This study established that level of education, fear of being diagnosed with cervical cancer, distance from the nearest health centre and preference of the health workers' gender were the significant factors influencing the uptake rate of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital.

Level of education

In this study, women with primary education (aOR = 0.8, 95%CI: 0.71-0.96, p = 0.02) and secondary education (aOR = 0.8, 95%CI: 0.61-0.91, p = 0.01) showed a lower statistical likelihood of uptake of cervical cancer screening services. This was in agreement with Lyimo & Beran (2012) who reported that women who purportedly had more knowledge about cervical cancer and were more educated were less likely to have screening done. However, this finding does not concur with those of Singh and Badaya (2012) who conducted a study at Hospital's Obstetrics and Gynaecology OPD, India among women of age, 35.51 ± 10.64 years, from June-August 2010 who did not find a statistical difference.

However, Mukama, Ndejjo, Musabyimana, Halage and Musoke (2017) carried out a study to assess the knowledge and attitudes of Ugandan women about cervical cancer prevention with the aim of informing prevention and control interventions. Level of education was associated with level of knowledge on prevention of cervical cancer especially in urban areas. They recommended that in order to increase uptake, there was need to scale up education about the same. Ebu and Ogah (2018) studied the predictors of intention to screen for cervical cancer amongst HIV positive women in Ghana. Their findings were more related to those of Mukama *et al* (2017).

Our findings could be attributed to the fact that the clients who have primary and secondary information have some information regarding screening and would require further education on

the topic before consenting. Also, the see-and-treat model of screening for cancer would be preferred and would most likely enhance uptake for these clients (Sigfrid et al., 2017).

Fear of being diagnosed with cervical cancer

The finding that fear of being diagnosed with cervical cancer influenced a lower likelihood of uptake of cervical cancer screening services (aOR = 0.4, 95%CI: 0.29-0.67, p = 0.01). The finding was related to the findings by Kumakech, Andersson, Wabinga, & Berggren (2015). It was also found out that fears of being found positive for both HIV and Cervical Cancer had other consequences such as stress, self-isolation, and social conflicts. This, however, was in qualitative study conducted in Kampala, Mbarara, and Ibanda districts in Uganda. Fear of being diagnosed with both Cervical Cancer and HIV was also reported by Horo *et al* (2012).

Twinomujuni *et al* (2015) also reported that a significant majority had fear of being diagnosed with cervical cancer as a deterrent factor to screening amongst women in Masaka, Uganda. Also, in another study by Ndejjo, Mukama, Kiguli, & Musoke (2017) on knowledge, facilitators and barriers to cervical cancer screening among women in Uganda, women expressed fears about being diagnosed with both cervical cancer and HIV due to the associated consequences such as losing sexual partners. It is important to note that Cancer has long inspired fear, but the effect of fear is not well understood; it seems both to facilitate and to deter early diagnosis behaviors. a core view of cancer as a vicious, unpredictable, and indestructible enemy, evoking fears about its proximity, the (lack of) strategies to keep it at bay, the personal and social implications of succumbing, and fear of dying from cancer (Vrinten et al., 2017).

Distance to the nearest health centre

Concerning distance from the nearest health centre, it was found that most clients who come from far and have to use a vehicle to reach the health centre had a less likelihood of uptake of services. Sigfrid *et al* (2017) had also reported similar findings. They reported that long distances to the nearest service facility coupled with high transport costs and long waiting time at the clinic discouraged uptake of cervical cancer screening services. This was in a systematic review on integrating cervical cancer with HIV health care services in Africa.

Lovgren, Soliman, Ngoma, Kahesa and Meza (2017) also found almost similar findings. They studied the geographic distribution of HIV positive women diagnosed with cervical cancer in Tanzania. One of the findings was that there was low utilization of screening services by women who stayed far away from the hospital and this was mainly the women from rural areas.

Twinomujuni *et al* (2015) also reported that those who had to walk long distances to the nearest health centre that can offer screening were less likely to screen. This was attributed to the associated costs of transportation, time of waiting and other health system inconveniences. Lyimo & Beran (2012) reported that living within two to five kilometers from the nearest service facility was significantly associated with uptake of screening services. The study population was majorly of low socio-economic class and so this finding could be attributed to the associated costs of transport and other expenses.

Preference of gender of the health worker

In regard to preference of the health workers' female gender being associated with a higher likelihood of uptake of cervical cancer screening services, Ndejjo, Mukama, Musabyimana, and Musoke (2016) in Eastern Uganda indicated that there was need to increase enrolment of more female staff at the screening health facilities if the uptake of cervical screening services was to be increased. Lyimo & Beran (2012) also reported similar findings that women would prefer fellow female health workers to screen them for cervical cancer. This could be attributed to the privacy of the African tradition who in most times would want to keep women issues to themselves. This study also showed that non preference of the health worker's gender was a significant factor compared to male gender. This similar finding was also shown in a recent study among women in a rural district in Tanzania (Nigussie, Admassu, & Nigussie, 2019).

5.2 Study strengths and weaknesses

This is the first study of its kind carried out in a rural HIV clinic setting of Western Uganda. The weakness with this study is that we used VIA which is not the best method of screening recommended by other higher income countries (HIC). Also, the study was done in a hospital settings and might not reflect what is in the community.

5.3 Conclusions

1. The uptake rate of cervical cancer screening services was moderately high vis-à-vis other similar local studies in Uganda.

2. The prevalence of premalignant cervical lesions was lower relative to comparable HIV populations.

3. The significant predictors of increased uptake of cervical cancer screening services among women attending the HIV/AIDS clinic at KIU Teaching Hospital were low level of education, no fear of being diagnosed with cervical cancer, short distance from the nearest health centre and preference of female gender of the health workers.

5.4 Recommendations

1. We recommend routine cervical cancer in the HIV/AIDS clinic at KIU-TH

2. Ministry of Health and other stakeholders should recruit more of female health workers in cervical cancer screening clinics in order to enhance uptake.

3. Health workers are recommended to conduct routine health education to HIV positive women to reduce fear of being diagnosed with cervical cancer.

4. Sensitization programs on cervical cancer screening in formal educational setting such as schools should be scaled up to enhance uptake of cervical screening services.

5. There is need for further work on a wider study on the best model to integrate cervical cancer screening services in HIV/AIDS care.

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Appendix 1: Consent Form

KAMPALA INTERNATIONAL UNIVERSITY (KIU) WESTERN CAMPUS (WC)

RESEARCH ETHICS COMMITTEE (REC)

PO Box 71, Bushenyi, Uganda; Tel: +256 758 096 775
E-mail: kiurec2017@kiu.ac.ug;Website: www.kiu.ac.ug

INFORMED CONSENT DOCUMENT

PART 1: CONSENT FOR STUDY

Study Title: "Prevalence of Premalignant cervical lesions and Factors influencing uptake of cervical cancer screening services among HIV Positive Women attending the HIV Clinic at Kampala International University Teaching Hospital, Bushenyi, Uganda"

Principal Investigator(s): Dr. Bekson Tayebwa, a postgraduate student in the department of obstetrics and gynaecology at Kampala International University Teaching Hospital (KIU-TH).
Qualifications: Bachelor of Medicine and Bachelor of Surgery (Gulu University, 2015).

INTRODUCTION

What you should know about this study:

- You are being asked to join a research study.
- This consent form explains the research study and your part in the study
- Please read it carefully and take as much time as you need
- You are a volunteer. You will not lose any benefits you are entitled to if you do not want to participate in the study or if you decide to withdraw in the middle of the study.

Leave blank (for REC Office only): **KIU WC REC Stamp:**	**For REC Office use only:** APPROVAL DATE: APPROVED CONSENT REC VERSION NUMBER: PI's NAME: REC NO:

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Brief background to the study

Cervical cancer screening has remained a public health problem being gynecological malignancy with the highest incidence and mortality in Uganda amongst females. The HIV infected women are at a higher risk of developing cervical cancer than the entire population. Screening and treating for cervical premalignant lesions is the major way to prevent cervical cancer. The World Health Organization recommends annual screening of HIV infected individuals. However, coverage of screening and uptake is still low due do several challenges especially in developing countries like Uganda. Integration of cervical cancer screening with HIV/AIDS healthcare could increase coverage.

Purpose of the research Project:

This study aims at assessing the prevalence of premalignant cervical lesions in women with HIV at KIU TH and the factors that influence the uptake rate of screening. We would also like to know the magnitude of the cervical premalignant lesions. This will guide in recommending the best ways to achieve screening goals and avert the Cervical cancer pandemic especially in vulnerable HIV/AIDS infected individuals.

Why you are being asked to participate:

You have been randomly selected to participate because you fulfill the criteria for recruitment in this study. All women that have the criteria for inclusion have been given an equal chance to participate in the study.

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Procedures:

In case you accept to take part in this study, you will be requested to answer questions regarding the topic on an investigator structured questionnaire. You will also be given a chance to be screened for cervical cancer.

Risks / discomforts:

We do not expect any risks but mild discomfort or pain may be felt during the process of collection of the sample from your cervix for screening for cancer. The study will take a few minutes of your time.

Benefits:

By the end of the study, you will be educated on the risks of cervical cancer and benefits of screening. You will also access free service for cervical cancer screening. If you are found positive on screening, you will be guided on how to access the appropriate treatment in the hospital or referred for further management accordingly. The community will also be sensitized on the importance of screening for cervical cancer. Results of this study may help to formulate polices at the institutional and government level.

Incentives / rewards for participating:

No payment shall be made to you for purposes of participation in this study. Any appreciation given to you in any form should not be considered as part of the research protocol.

Protection of data confidentiality:

You are assured that any information given will not be linked to you directly and your personal details will not be shared with any person. These results shall not be disclosed to anyone without the consent of the research participant.

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Protecting subject privacy during data/sample collection:

Data shall be obtained from an enclosed place designated in the HIV/AIDS clinic. We shall also ensure privacy is adhered to during collection of the sample for cervical cancer screening.

Right to refuse / withdraw:

Your participation in the study is purely voluntary, and refusal to participate will involve no loss of benefits that you are entitled to.

What happens if you leave the study?

You are invited to participate in the study. Note that it is your right to accept or not to accept and that your refusal shall not interfere with the services provided to you at Kampala International University Teaching Hospital.

Who do I ask/call if I have questions or a problem?

You may reach the principle investigator through the following contacts: **+256-775444109**

And/or KIU-TH Research Ethics Committee at **+256-772621482/0758096775**

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What does your signature (or thumbprint/mark) on this consent form mean?

Your signature on this form means

- You have been informed about this study's purpose, procedures, possible benefits and risks
- You have been given the chance to ask questions before you sign
- You have voluntarily agreed to be in this study

Name of participant ……. Signature/Thumbprint…… Date……..

Name of witness …… Signature …….. Date ……

Name of researcher …… Signature …… Date ……

PART 2: CONSENT FOR CERVICAL CANCER SCREENING

I……. is due to undergo screening for cervical after being educated and counseled. I have understood the explanations and hereby give my consent in the form of a signature/thumb print, for the said procedure to be carried out on me.

Participant's name …….. Signature…… Date……

Name of witness …… Signature…… Date ……

Name of Researcher …… Signature …… Date …….

Leave blank (for REC Office only): **KIU WC REC Stamp:**	**For REC Office use only:** APPROVAL DATE: APPROVED CONSENT REC VERSION NUMBER: PI's NAME: REC NO:

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Appendix 2: Translated Consent Form

KAMPALA INTERNATIONAL UNIVERSITY (KIU) WESTERN CAMPUS (WC)

RESEARCH ETHICS COMMITTEE (REC)

PO Box 71, Bushenyi, Uganda; Tel: +256 758 096 775
E-mail: kiurec2017@kiu.ac.ug;Website: www.kiu.ac.ug

EKIHANDIIKO KIRIKUHAMYA OKWIKIRIZAKWEGAITA OMU KUCONDOOZA BWANYIMA YÓKUSHOBORORERWA KURUNGI

AKACWEKA KOKUBANZA: OKWIKIRIZA KWEGAITA OMU KUCONDOOZA

OMUTWE: *Obwngyi bw'oburweire bwomunwa gwa nyinenda oburikurugamu ekookoro n'enshonga ezirikukwata aha kwikiriza kuceberwa ekookoro yomunwa gwa omubakyara abarikutunga obuhereza omu'irwariro rya'akakoko ka siriimu aha itendekyero rikuru erya Kampala Intanashonolo*

Mukuru w'okucondooza: Dokita Bekson Tayebwa, omwegi wa diguri ye'idaara rya kabiri y'okugunjuka obushaho bw'ebyokuzarisa ah'eitendekyero erikuru erya Kampala Intanasholo, eitagi erya burengyerweizooba.

Obwegyese: Omushaho (Dokita) ayine diguri omukujanajabisa emibazi hamwe n'okushemeza abantu eiyashomeire mwitendekyero erikuru erya Gulu omumashuma ga Uganda.

OKWANJURA

Eby'oshemereire kumanya ahakucondooza oku:

- Noshabwa kwejumba omu kucondooza oku.
- Ekihandiiko eki nikishoborora ebirikukwaata aha kucondooza oku kandi niiwe ori omwe ahabarikushabwa kwejumba omukucondooza oku.

• **Leave blank (for REC Office only):** • • **KIU WC REC Stamp:** •	**For REC Office use only:** APPROVAL DATE: APPROVED CONSENT REC VERSION NUMBER: PI's NAME: REC NO:

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- Shoma eki kihandiiko kandi oyetegyereze kumara obwiire bworikwenda.
- Noshabwa kuza omukundooza oku oyekundiire katariho kugyemwa nainga kushashurwa esente kandi noikizibwa kurugamu eshaaha yoona hataine ekirikukuteera ahamukono

Oburugo bw'okucondooza oku omubugufu

Okucondoozaoku kukwatiraine n'okucebera ekookoro yomunwa gwa nyinenda. Kansa egyi niyo erikukyirayo kukwata nokwita abakazi munonga kukira munonga omu'Uganda. Abakyala abarikuba baine akakooko ka siriimu ninbakira kukwatwa ekookoro egyi kusinga abandi boona. Okukyebera kandi nokutambira kansa egyi etakakuzire nogwo muringo ogurilukyirayo omu'kugirwanisa. Omubarwire abaine akakooko ka siriimu, ekitongole kyamagala ekyensi yoona nikyiragiira ngu bashemereire kuba nibakyeberwa buri mwaka. Konka ekyi tikirikukorwa nkoku kishemereire kuba ahabwenshonga nyingi. Nituteekateka ngu okureeta obuhereza bwokukyebera omu'irwariro rya'kakooko ka siriimu nikibaasa kuyamba kukyebera abantu bingyi kusinga buriijo.

Ekigyendererwa ky'okucondooza oku

Ekigyendererwa kikuru kyókucondooza oku n'okwenda kumanya enshonga ezirikurereteraabakazi abaine akakooko ka siriimu baikiriza kukyeberwa ekookoro yomunwa gwa nyinenda. Omuringo ogu'turikwenda kugyeza nokushanga omushaho yaba niwe yashaba omurweire kuceberwa reero omurweire akasharaho kwikiriza ninga akanga. NItwenda kumanya okwikiriza kwobubuhereza hamwe nenshonga ezirikutuma abakazi bakozesa obuhereza obu. Kandi, nitwenda kumanya obwingyi bwoburweire obu omubakazi abaine akakooko ka siriimu. Ekyi nikyiija kuyamba kusharamu emiringo nemitwarize omunkora yokurwaniza ekookoro yomunwa gwa nyinenda.

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Ahabwenki noshabwa kwejumba omukucondooza oku?

Watooranwa kuba omwe ahabarayejumbe omukucondooza oku ahabwokuba oine byoona ebi orikujumba omukucondooza oku ashemererire kuba aine.

Ebiraakorwe

Ku oraikirize kweejumba omu kucondooza oku noija kushobororerwa ebirikukwaata ahakucebera ekookoro yomunwa gwa nyinenda. Bwanyima noija kushabwa kugarukamu ebibuuzo bikwatirine nokucebera kandi noija nokuhebwa omugisha gwokucebeza ekookoro yomunwa gwa nyinenda.

Ebikubaasa kukuteganisa omukucondooza oku

Tihariho ebikutinisa by'amani omukucondooza oku okwihaho okugira ngu nobaasa kuhurira noteganisibwa twaba nitukucebera ahamunwa gwa nyinenda.

Ebirungi ebirikubaasa kuruga omukucondooza oku

Owayejumbe omukucondooza oku naija kwegyesibwa ahabirikukwaata aha kucebera ekookoro yomunwa gwa nyinenda. Noija kuhebwa omugisha gwokuceberwa ekookoro yomunwa gwa nyinenda. Twashanga ngu oine oburweire, nitwija kukworeka oku orikubaasa kujanjabwa. Ebirarugye omukucondooza oku nibyija kutuyambwa kusharamu aha miringo eyokuyamba kucendeeza ekookoro yomunwa gwa nyinenda omubakazi abaine akooko ka siriimu.

Ninyija kushashurwa ahabowokwejumba omu kucondooza oku? Ebirungi ebirikubaasa kuruga omukucondooza oku

Owayejumbe omukucondooza oku naija kwegyesibwa ahabirikukwaata aha kucebera ekookoro yomunwa gwa nyinenda. Noija kuhebwa omugisha gwokuceberwa ekookoro yomunwa gwa nyinenda. Twashanga ngu oine oburweire, nitwija kukworeka oku orikubaasa kujanjabwa. Ebirarugye omukucondooza oku nibyija kutuyambwa kusharamu aha miringo eyokuyamba kucendeeza ekookoro yomunwa gwa nyinenda omubakazi abaine akooko ka siriimu.

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Ninyija kushashurwa ahabowokwejumba omu kucondooza oku?

Tihaine kushashurwa kwoona nainga ebiconco byoona ebireije kukuheebwa ahabwokwejumba omu kucondooza oku. Ekirakukorerwe kyoona tikishemereire kubarwa nk'empeera yokuza omu'kucondooza oku.

Okukuuma ebihama

Nitukuhamiza kugira ngu ebi'oratugambire tibireije kugambirwa abandi bantu.Ebikwatiraine n'amaziiina gaawe nainga ahi orikuruga tibireije kugambirwa abandi tutaine rusa rwaawe.

Ekindi,nitwiija kukubuuriza omumwanya ogukingire ahi abakazi barikuzarira nahabwekyo tihaine orahurire ebyoragambe nainga ebirakorwe atari omwe ahabari kucondooza.

Okuruga omukucondooza ahorayendere

Okweejumba omukucondooza oku nokikora hatariho kugyemeserezibwa kwoona kandi noikirizibwa kurugamu ahiwayendera hatariho ekirikukuteera aha mukono neinga kuferwa ebyoshemereire kuba nokorerwa.

Nimbaasa kwebuuza aharyoha?

Noobasa kuhikirira mukuru w'okucondooza aha namba y'esimu **0775444109**

Neinga eya mukuru w'akakiiko akarikureberera eby'okucoondoza ah'eitendekyero rikuru erya Kampala Intanashonolo ahari **+256-772601482/0758096775**

Leave blank (for REC Office only): **KIU WC REC Stamp:**	**For REC Office use only:** APPROVAL DATE: APPROVED CONSENT REC VERSION NUMBER: PI's NAME: REC NO:

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Okuteeka omukono neinga ekinkumu aha kihandiiko eki nikimanyisaki?

Nikimanyisa ngu:

- Washoborokyerwa ekiturikukorera okucondooza oku, okuturatwaze,akarungi akarimu kandi nebiraakorwe byoona hamwe nokwoorikubaasa kukuteganisibwa.
- Waherezibwa omugisha gw'okubuuza ebi'otayetegyereza kandi ebibuuzo byaawe byagarukwamu kurungi.
- Waikiriza otagyemirwe kwejumba omukucondooza oku.

----------	----------	----------
Eizina ryorikugarukamu ry'owikiriza kuza omukucondooza	Omukono/ekinkumu	Ebiro by'okwezi
…….....	……	…….
Eiziina ry'orikukurira okucondooza	Omukono	Ebiro byokwezi
----------	----------	----------
Amaziina g'omujurizi	Ekinkumu/omukono	Ebiro byokwezi

Leave blank (for REC Office only): **KIU WC REC Stamp:**	**For REC Office use only:** APPROVAL DATE: APPROVED CONSENT REC VERSION NUMBER: PI's NAME: REC NO:

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AKACWEKA KAKABIRI: OKWIRIZA KUCEBERWA EKOOKORO YOMUNWA GWA NYINENDA.

Nyowe ……. kuceberwa ekookoro yomunwa gwa nyinenda obwo naamara kwegyesibwa nokushoboorokyerwa. Nayetegyereza okushobororerwa.Nikiriza hatariho kugyemeserezibwa kandi nimpamya kuhatariho okuhakanisa okuruga aha mukundwa wangye nainga abanyabuzaare.

Eizina ry'owikiriza kuceberwa ekookoro yomunwa gwa nyinenda……..

Omukono/ ekinkumu …… Ebiro byokwezi…….

…… ……
…….

Eizina ry'omujurizi Omukono/Ekinkumu Ebiro byokwezi

……..... ……. …….

Eiziina ry'orikukurira okucondooza Omukono Ebiro byokwezi

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Appendix 3: Interviewer Administered Questionnaire

Serial number …… Date……

PART A: DEMOGRAPHIC DATA.

Please circle the appropriate answer applicable to you.

1. Age …… (completed years)
2. Address (currently location)
    1. Bushenyi
    2. Rubiriizi
    3. Mitooma
    4. Sheema
    5. Others (Please Specify district: ……)
3. Area of residence (specify region of current residence)
    1. Urban
    2. Rural
4. Marital status
    1. Single
    2. Married
    3. Divorced/Separated
    4. Widowed
5. Living with sexual partner
    1. Yes
    2. No
6. Type of relationship for those living with sexual partner
    1. Monogamous
    2. Polygamous
7. Level of education
    1. No formal education
    2. Primary
    3. Secondary
    4. Tertiary institution or University
8. Tribe
    1. Munyankole
    2. Mukiga
    3. Muganda
    4. Other (Please specify: …….)
9. Religion
    1. Christian
    2. Muslim
    3. Others (Please specify: ……)
10. Occupation
    1. Student
    2. Peasant/farmer
    3. Self employed
    4. Civil servant
    5. Other (Specify……)

11. Average income at home per month
    1. < UGX 120,000
    2. UGX 120,000 </= 500,000
    3. >UGX 500,000
12. Parity (report total number of pregnancies ever carried including abortions)
    1. 0
    2. 1 to 5
    3. >5
13. Age at coitarche (note age of first time unprotected sex)…….
    1. < 19 years
    2. 19 years to < 25 years
    3. > 25 years
14. Estimated distance to nearest health centre (H/C III or greater) and means of transport
    1. Near and walkable
    2. Far and have to use a bodaboda
    3. Far and have to use a vehicle
15. Duration spent with HIV
    1. < 6 months
    2. 6 months to < 1 year
    3. 1 year to < 5 years
    4. > 5 years
16. Duration on HAART
    1. < 6 months
    2. 6 months to < 1 year
    3. 1 year to < 5 years
    4. > 5 years
17. Most recent viral load
    1. Suppressed
    2. Non-suppressed

PART B: Factors associated with uptake of cervical cancer screening amongst women in HIV/AIDS clinic

18. Have you ever heard about cervical cancer screening?
    1. Yes
    2. No
19. Select any of the following that you ever discussed with about cervical cancer?
    1. Spouse or Relatives
    2. Peers
    3. Health workers
20. Do you have to seek for permission from your spouse before seeking health care?
    1. Yes
    2. No

21. Do you have any fear of being diagnosed with cervical cancer?
    1. Yes
    2. No
22. Would you prefer cervical cancer screening service from a male or female healthcare service provider?
    1. Female
    2. Male
23. Have you ever been screened for cervical cancer?
    1. Yes
    2. No

If yes, (If No, skip to number 27)

24. How many times have you been screened?
    1. Once
    2. Twice
    3. More than twice
25. How long ago did you have screening done?
    1. < 1 Year ago
    2. 1 - 3 years ago
    3. > 3 years ago
26. Did you have to pay to have cervical cancer screening?
    1. Yes
    2. No

If no,

27. Why have you never had screening for cervical cancer (circle all the reasons that apply)
    1. I didn't know about cervical cancer screening
    2. Don't know where to get the service from
    3. Cost is high
    4. Distance to nearest H/C is long
    5. Time consuming
    6. Fear of the screening procedure and pain/discomfort
    7. Husband doesn't allow
    8. Cultural does not allow
28. Do you think screening for cervical cancer at the same visit to the HIV/AIDS clinic is a good idea?
    1. Yes
    2. No

PART C: Uptake rate of cervical cancer screening

We are providing cervical cancer screening services today with in the HIV/AIDS clinic. This will involve physical examination of your genitalia and insertion of a vaginal speculum. You may experience some discomfort but no pain at all. The results will be kept confidentially.

29. Would you like to be screened for cervical cancer now?
    1. Yes
    2. No

    If yes, please sign "Part 2" of the attached consent form.

30. If No, Do you intend to screen for cervical cancer in the near future?
    1. Yes
    2. No

The results from this test will be returned to you after the test. In case of need, you will be referred for further appropriate management. Please provide for us an active phone number here: …… or ……

For Official Use Only

31. Results/reporting (Using Visual Inspection under Acetic Acid)
    1. VIA Negative
    2. VIA Positive
    3. VIA Positive (Suspicious of Carcinoma)

    Comment: ……

Appendix 4: Procedure/Technique for Visual Inspection Under Acetic Acid (VIA) and Interpretation

Instruments and materials required:

- Examination table with knee crutches or leg rests or stirrups;
- Good light source (Preferably a bright halogen lamp that can be easily directed at the cervix or a bright halogen torch light);
- Sterile bi-valved speculum: we shall use a Cusco's type of speculum.
- Pair of gloves;
- Cotton swabs, cotton-tipped buds, gauze;
- Ring forceps, pickup forceps;
- 5% freshly prepared acetic acid or vinegar (check the strength of acetic acid in vinegar);
  A steel/plastic container with 0.5% chlorine solution in which to immerse the gloves;
- A plastic bucket or container with 0.5% chlorine solution to decontaminate instruments;
- A plastic bucket with a polythene bag to dispose of contaminated swabs and other waste items

Preparation of 5% dilute acetic acid

- 5% acetic acid is prepared by adding 5 ml of glacial acetic acid into 95 ml of distilled water.
- If vinegar bought from a store is used, check the strength to ensure that it is 5%.

Procedure:

The woman is invited to lie down in a modified lithotomy position on a couch with leg rests or knee crutches or stirrups. After proper positioning of the woman, observe if there is any vaginal discharge. Observe the external genitalia and perineal region for any signs of excoriations, oedema, vesicles, papules, sores, ulceration and warts.

Look for any swelling in the inguinal/femoral region. Afterwards, gently introduce a sterile vaginal speculum which has been immersed in warm water and open the blades of the speculum to view the cervix. Adjust the light source so that there is adequate light in the vagina and on the cervix. As the speculum is gently opened and the lips are fixed, the cervix comes into view. Observe the size and shape of the cervix. Identify the external os, columnar epithelium (red in colour), squamous epithelium (pink) and the squamocolumnar junction. proceed to identify the transformation zone, the upper limit of which is formed by the squamocolumnar junction. Remember that cervical neoplasias occur in the transformation zone nearest to the squamocolumnar junction.

Look for ectropion, cervical polyp, nabothian cysts, healed laceration of the cervical lips, leukoplakia, condylomata and signs of cervicitis. You may note that in postmenopausal women, the cervix appears pale and brittle, due to thinning and atrophy of the squamous epithelium. Assess the characteristics of discharge in terms of quantity, colour, odour and thickness. Thread-like, thin mucinous discharge from the external os indicates ovulation. If heavy blood flow through the external os is observed in women during menstruation, they may be subjected to VIA after 5-15 days. In ectropion, the cervix has a large area of red appearance around the external os and the squamocolumnar junction far away from the os. Nabothian cysts appear as bulging blue-white or yellow-white nodules, having a smooth delicate lining with branching blood vessels. In some women, nabothian cysts can become large and distort the shape of the cervix. A cervical polyp appears as a smooth mass ORotruding from the cervical canal beyond the external os, which may appear dark red or pink-white. Sometimes a necrotic polyp resembles a cervical cancer. Healed lacerations appear as tears on the lips of the cervix, with the external os appearing irregular. Leukoplakia appears as a smooth-surfaced, white area on the cervix that cannot be removed or scraped off. Cervical condylomata appear as raised, grey-white areas within or

outside the transformation zone in the squamous epithelium and may be accompanied by similar lesions in the vagina and vulva. Look for small blisters containing fluid or multiple, small ulcers on the cervix.

Extensive erosive red areas may be present on the cervix, extending to the vagina in instances of severe cervical infection and inflammation. Observe whether there is any bleeding from the cervix, especially on touch, or ulceroproliferative growth. A very early invasive cancer may present as a rough, reddish, granular area that may bleed on touch. More advanced invasive cancers may present as a large exophytic growth with an ulceroproliferative, bulging mass with polypoid or papillary excrescences, arising from the cervix or as a predominantly ulcerating growth replacing most of the cervix. In both of these types, bleeding on touch and necrosis are predominant clinical features. Foul smelling discharge is also common due to superadded infection.

Occasionally, invasive cancer can present as an infiltrating lesion with a grossly enlarged irregular cervix. Now, gently, but firmly, apply 5% acetic acid using a cotton swab soaked in acetic acid. The secretions should be gently wiped off. The swabs after use should be disposed of in the waste bucket. The curdy-white discharge associated with candidiasis is particularly sticky, and if particular care is not taken to remove it properly, it may mimic an aceto-white lesion, thus leading to a false-positive result. After removing the swab, carefully look at the cervix to see whether any white lesions appear, particularly in the transformation zone close to the squamo-columnar junction, or dense, non-removable aceto-white areas in the columnar epithelium. The results one minute after application of acetic acid should be reported. Note how rapidly the aceto-white lesion appears and then disappears.

- The intensity of the white colour of the aceto-white lesion: if it is shiny-white, cloudy-white, pale-white or dull-white.

- The borders and demarcations of the white lesion: distinctly clear and sharp or indistinct diffuse margins; raised or flat margins; regular or irregular margins.

- Whether the lesions are uniformly white in colour, or the colour intensity varies across the lesion, or if there are areas of erosion within the lesion.

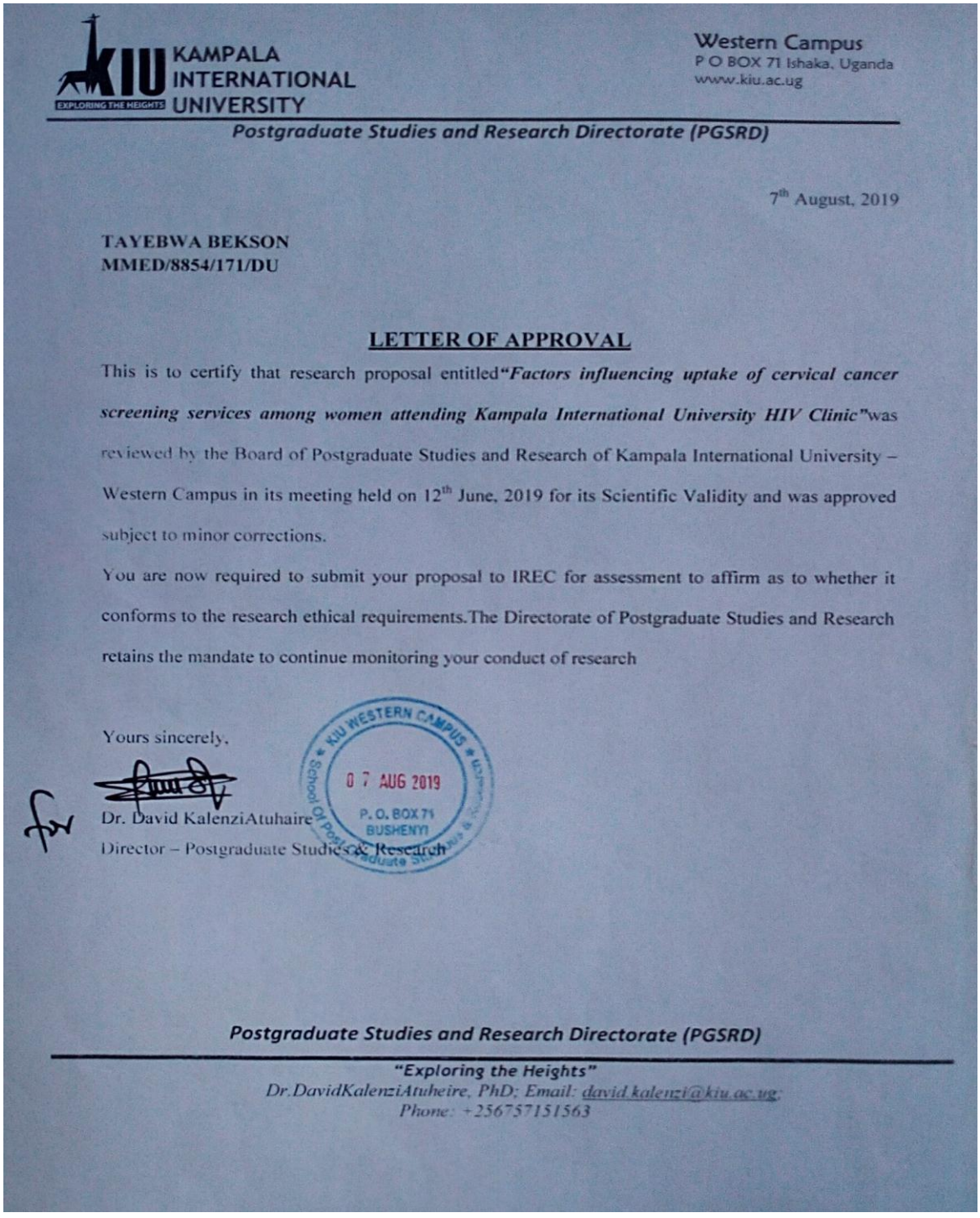
- Location of the lesion: is it in, near or far away from the transformation zone? Is it abutting (touching) the squamocolumnar junction? Does it extend into the endocervical canal? Does it occupy the entire, or part of, the transformation zone? Does it involve the entire cervix (which usually indicates early preclinical invasive cancer)?

- Size (extent or dimensions) and number of the lesions. If in doubt, it is safe to repeat the test a few times, taking care not to induce bleeding. Women with suspected invasive cancers should be referred for further investigations and treatment.

VIA Category	Clinical findings
Test Negative	No acetowhite lesions or faint acetowhite lesions; polyp, cervicitis, inflammation, Nabothian cysts
Test Positive	Sharp, distinct, well-defined, dense (opaque/dull or oyster white) acetowhite areas—with or without raised margins touching the squamocolumnar junction (SCJ); leukoplakia and warts
Suspicious for cancer	Clinically visible ulcerative, cauliflower-like growth or ulcer; oozing and/or bleeding on touch.

Source: (World Health Organization, 2013)

Appendix 5: Approval letter from KIU Postgraduate Studies and Research Directorate (PGSRD)



KAMPALA INTERNATIONAL UNIVERSITY
EXPLORING THE HEIGHTS

Western Campus
P O BOX 71 Ishaka, Uganda
www.kiu.ac.ug

Postgraduate Studies and Research Directorate (PGSRD)

7th August, 2019

TAYEBWA BEKSON
MMED/8854/171/DU

LETTER OF APPROVAL

This is to certify that research proposal entitled ***"Factors influencing uptake of cervical cancer screening services among women attending Kampala International University HIV Clinic"*** was reviewed by the Board of Postgraduate Studies and Research of Kampala International University – Western Campus in its meeting held on 12th June, 2019 for its Scientific Validity and was approved subject to minor corrections.

You are now required to submit your proposal to IREC for assessment to affirm as to whether it conforms to the research ethical requirements. The Directorate of Postgraduate Studies and Research retains the mandate to continue monitoring your conduct of research

Yours sincerely,

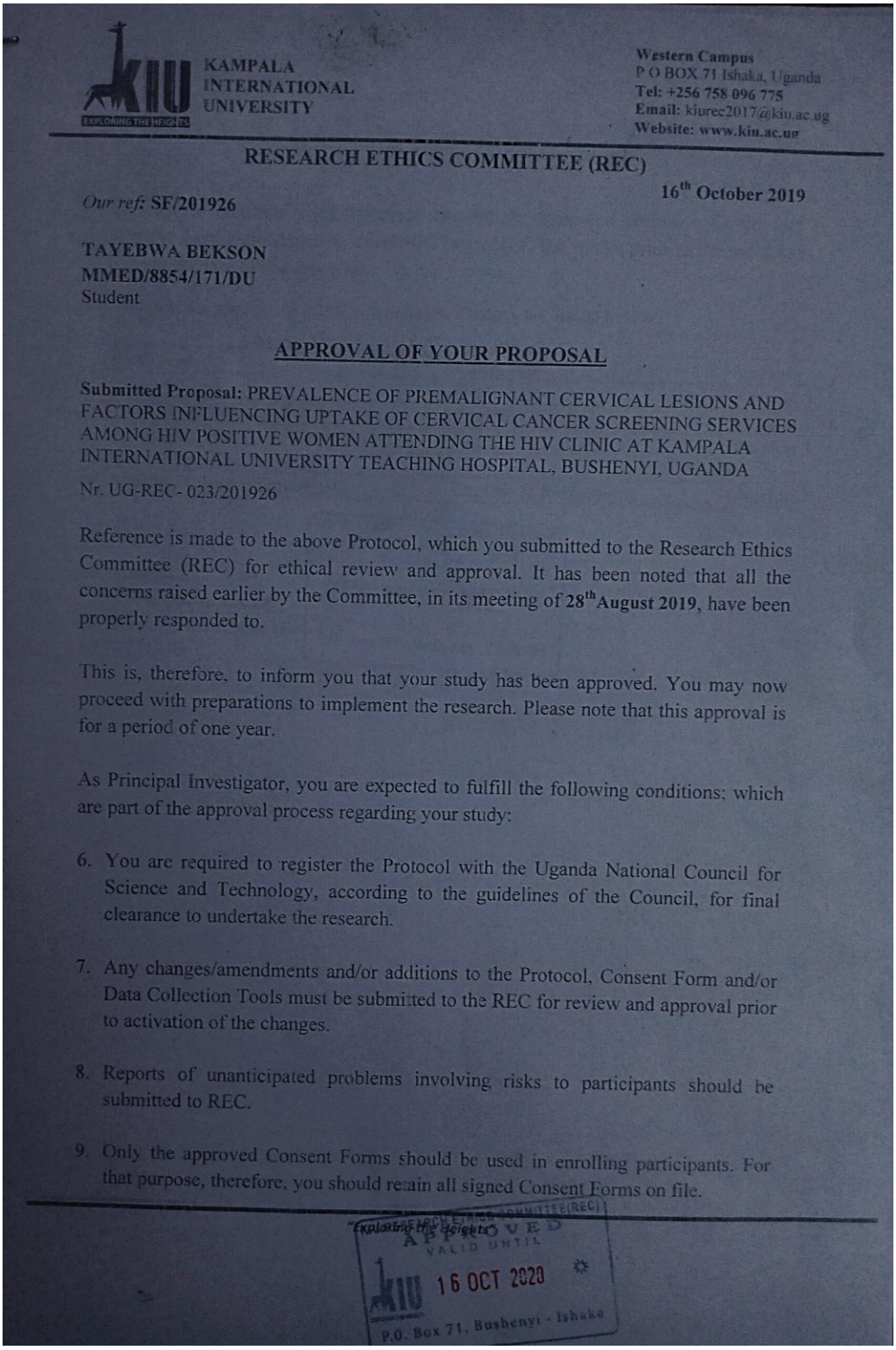
KIU WESTERN CAMPUS
07 AUG 2019
P. O. BOX 71
BUSHENYI

Dr. David KalenziAtuhaire
Director – Postgraduate Studies & Research

Postgraduate Studies and Research Directorate (PGSRD)

"Exploring the Heights"
Dr.DavidKalenziAtuheire, PhD; Email: david.kalenzi@kiu.ac.ug;
Phone: +256757151563

Appendix 6: Approval letter from KIU Research Ethics Committee (REC)



KAMPALA INTERNATIONAL UNIVERSITY

EXPLORING THE HEIGHTS

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RESEARCH ETHICS COMMITTEE (REC)

Our ref: **SF/201926**

16th October 2019

TAYEBWA BEKSON
MMED/8854/171/DU
Student

APPROVAL OF YOUR PROPOSAL

Submitted Proposal: PREVALENCE OF PREMALIGNANT CERVICAL LESIONS AND FACTORS INFLUENCING UPTAKE OF CERVICAL CANCER SCREENING SERVICES AMONG HIV POSITIVE WOMEN ATTENDING THE HIV CLINIC AT KAMPALA INTERNATIONAL UNIVERSITY TEACHING HOSPITAL, BUSHENYI, UGANDA

Nr. UG-REC- 023/201926

Reference is made to the above Protocol, which you submitted to the Research Ethics Committee (REC) for ethical review and approval. It has been noted that all the concerns raised earlier by the Committee, in its meeting of **28th August 2019**, have been properly responded to.

This is, therefore, to inform you that your study has been approved. You may now proceed with preparations to implement the research. Please note that this approval is for a period of one year.

As Principal Investigator, you are expected to fulfill the following conditions: which are part of the approval process regarding your study:

6. You are required to register the Protocol with the Uganda National Council for Science and Technology, according to the guidelines of the Council, for final clearance to undertake the research.

7. Any changes/amendments and/or additions to the Protocol, Consent Form and/or Data Collection Tools must be submitted to the REC for review and approval prior to activation of the changes.

8. Reports of unanticipated problems involving risks to participants should be submitted to REC.

9. Only the approved Consent Forms should be used in enrolling participants. For that purpose, therefore, you should retain all signed Consent Forms on file.

"Exploring the Heights"

APPROVED
VALID UNTIL
16 OCT 2020
P.O. Box 71, Bushenyi - Ishaka

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RESEARCH ETHICS COMMITTEE (REC)

10. In order to continue with the study beyond the approved period, a Continuing Review Application must be submitted to the REC ten weeks prior to the indicated expiration date of the approval.

The documents approved in this Application Process are listed below:

Document	Language	Version
Protocol	English	Version 3
Protocol Application Form	English	Version 1
Data Collection Tools (Questionnaire Interview guide)	English & Runyankole	Version 3
Informed Consent Document	English & Runyankole	Version 3

KIU RESEARCH ETHICS COMMITTEE(REC)
APPROVED
VALID UNTIL
16 OCT 2020
P.O. Box 71, Bushenyi - Ishaka

Dr. Patrick Mbyemeire (Rev. Fr)
REC CHAIR