RISK FACTORS AND PREVALENCE OF HUMAN PAPILLOMA VIRUS AMONG HIV POSITIVE WOMEN ATTENDING ANTIRETROVIRAL THERAPY CLINIC IN CHINA-UGANDA FRIENDSHIP HOSPITAL NAGURU

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A DISSERTATION SUBMITTED TO THE FACULTY OF PUBLIC HEALTH, NURSING AND MIDWIFERY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF THE MASTER OF PUBLIC HEALTH LEADERSHIP OF UGANDA CHRISTIAN UNIVERSITY

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DECLARATION

I have personally and keenly read through the research rules that Uganda Christian University came up with concerning plagiarism and hereby state that this piece of work is mine and from my own efforts.

Furthermore, I assert that this work has never been submitted to any institution for any other degree or qualification, either in full or part and I would like to bring it to your knowledge that this is the first time it is being produced and for public consumption.

Throughout this work, I have endeavored to acknowledge every source of reference used in its compilation in a highly professional manner to the best of my knowledge and with the highest degree of honesty that I can afford.

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APPROVAL

From its initial stages, the process of development of this piece of work has been carefully over seen and examined in a stepwise manner for authenticity and professionalism. Patience and quality punctuate every bit of phrase used herein.

To the best of my understanding, I affirm that this work has been produced under my close supervision without any undue influence whatsoever.

Name of Supervisor: **DR.EDWARD KIBIKYO MUKOOZA**

Signature of Supervisor:  **Date:30/7/2024**

DEDICATION

This report is dedicated to my family for their resilience and constant emotional support in all.

ACKNOWLEGEMENT

First of a thank God almighty for my life and success in my academics. I extend my sincere thanks to my supervisor, Dr. Edward Kibikyo Mukooza without whose guidance and encouragement, this report would not have been submitted.

I want to extend my sincere appreciation to all the respondents who endeavoured to provide responses voluntarily on short notice, thank you so much.

May the lord reward you with lavishness.

ACRONYMS

AIDS	**Acquired Immune Deficiency Syndrome**
CUFH	China-Uganda Friendship Hospital Naguru
CVI	Content Validity Index
FP	Family Planning
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
PAP	Papanicolaou (Pap) Smear
SES	Socioeconomic Status
SPSS	Statistical Package for Social Sciences
STD	Sexually Transmitted Diseases
UCU REC	Uganda Christian University Research Ethics
ART	Antiretroviral Therapy
HR HPV	High Risk Human Papilloma Virus
MOH	Ministry of Health
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Human Papillomavirus (HPV): A group of viruses that infect the skin and mucous membranes of humans, commonly transmitted through sexual contact. HPV is associated with various health conditions, including genital warts and certain cancers.

Genital Warts: Also known as condylomata acuminata, these are benign growths caused by HPV infection, typically appearing on or around the genitals or anal area.

Cervical Cancer: Cancer that develops in the cervix, often linked to persistent infection with high-risk HPV types, particularly HPV-16 and HPV-18.

Low-risk HPV: HPV types that are less likely to cause cancer but may still lead to genital warts or other benign conditions.

High-risk HPV: HPV types associated with an increased risk of developing cancer, particularly cervical cancer, as well as other cancers such as anal, penile, vaginal, and oropharyngeal cancers.

HPV Vaccines: Vaccines designed to prevent infection with certain HPV types. Currently available HPV vaccines target the most common high-risk types (e.g., HPV-16 and HPV-18) as well as some low-risk types (e.g., HPV-6 and HPV-11).

Pap smear (Pap test): A screening test for cervical cancer that involves collecting cells from the HPV infection.

Immunization: The process of inducing immunity to a specific disease through vaccination, including the development of protective antibodies against HPV.

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ABSTRACT

Introduction: Human Papillomavirus (HPV) infection poses a significant public health challenge, especially among women aged 18 years and above, particularly in resource-constrained settings. Understanding the factors influencing HPV prevention and control is crucial for devising effective interventions. The study aimed to determine the prevalence and determinants of HPV infection among women aged 18 years and above at China-Uganda Friendship Hospital Naguru.

Methodology: A cross-sectional study was employed to gather data from a sample of women aged 18 years and 49years attending ART clinic at China Uganda Friendship Hospital. The sample comprised of women who had tested for HPV. The study objectives were to determine the Prevalence of HPV, to identify socio demographic risk factors and to assess sexual behaviour-related risk factors associated with HPV infection among HIV positive women 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru. Data analysis was done using Stata 16 and logistic regression was used to assess associations between predictor variables and HPV variables.

Results: The results revealed that the prevalence of HPV among 333 HIV-positive women aged 18 years and above was 21.6%. Education level emerged as a significant sociodemographic predictor of HPV infection (p=0.039,PR=1.71, 95% CI: 1.03-2.85), while the significant behavioural risk predictors for HPV infection included HPV immunization status and the number of sexual partners (aPR = 4.72, 95% CI: 2.58–8.63, $p < 0.001$).

Conclusion: The study identified education level, HPV immunization status and having three or more sexual partners as significant predictors of HPV infection among HIV-positive women at the ART clinic. These findings underscore the importance of education and promoting of HPV vaccination and safer sexual practices to reduce HPV transmission.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Human Papillomavirus (HPV) is a significant global public health concern due to its widespread prevalence and association with various cancers. HPV is one of the most common sexually transmitted infections (STIs) worldwide, transmitted primarily through sexual contact and skin-to-skin contact. It affects individuals of all demographics and regions.

According to the World Health Organization (WHO), HPV infection is responsible for approximately 291 million cases among women globally, with varying prevalence rates across different regions and age groups (WHO, 2020). Moreover, HPV is a leading cause of several cancers, including cervical, anal, penile, vulvar, vaginal, and oropharyngeal cancers. Cervical cancer, for instance, ranks as the fourth most common cancer in women globally, with HPV being the primary causative agent, contributing to nearly all cases (IARC, 2020).

Various factors contribute to the global burden of HPV. Socio-economic status, access to healthcare, cultural attitudes towards sexual health, and vaccination rates all play significant roles. Low- and middle-income countries often experience a higher burden of HPV-related diseases due to limited access to preventive measures such as HPV vaccination and cervical cancer screening programs (Bruni, L., 2017).

Efforts to address HPV on a global scale primarily focus on prevention, early detection, and treatment strategies. HPV vaccination programs have been implemented in many countries to protect against high-risk HPV strains. These programs target adolescents and young adults to reduce the incidence of HPV-related cancers and associated health complications. Additionally, cervical cancer screening programs, including Pap smears and HPV DNA testing, are crucial for early detection and treatment of precancerous lesions (Boily, M.C., et al., 2019).

Numerous studies have documented the high prevalence of HPV infection in various African countries, highlighting the urgent need for comprehensive interventions (Louie, K., de Sanjosé, S and Mayaud, P. 2019). These studies have identified factors such as limited access to healthcare services, low awareness about HPV and cervical cancer, cultural taboos surrounding sexual health, and socio-economic disparities as key contributors to the persistent burden of HPV in Africa (Okafor, I. P., et al., 2018).

In East Africa, Human Papillomavirus (HPV) remains a significant public health concern, contributing substantially to the burden of cervical cancer and other HPV-related diseases. This region, comprising countries such as Kenya, Tanzania, Uganda, Rwanda, and Burundi, faces unique challenges in addressing the HPV epidemic, including limited healthcare infrastructure, socio-economic disparities, and cultural beliefs surrounding sexual health.

Studies conducted in East Africa have consistently shown high prevalence rates of HPV infection, particularly among women (Denny L, 2012). Factors such as early sexual debut, multiple sexual partners, lack of comprehensive sex education, and limited access to preventive measures contribute to the elevated burden of HPV in the region (Cherish, M. F., et al., 2014). Additionally, the predominance of certain high-risk HPV genotypes further exacerbates the risk of developing cervical cancer.

Uganda, like many other countries in East Africa, grapples with the burden of Human Papillomavirus (HPV) infection and its associated diseases, particularly cervical cancer. Despite efforts to address these challenges, the prevalence of HPV and cervical cancer in Uganda remains high, posing significant public health concerns.

Studies conducted in Uganda have consistently demonstrated a high prevalence of HPV infection among women, with certain regions experiencing particularly elevated rates (Banura, C., Sandin, S. et al.,2008). Factors contributing to the high burden of HPV in Uganda include limited access to healthcare services, low awareness about HPV and cervical cancer, cultural beliefs surrounding sexual health, and socio-economic disparities (Mutyaba, T., Mmiro, F. A., Weiderpass, E, 2006).

Cervical cancer ranks among the leading causes of cancer-related mortality among women in East Africa. The lack of organized cervical cancer screening programs and inadequate access to HPV vaccination contribute to late-stage diagnosis and poor treatment outcomes (Nabunya, E., et al., 2018).

Cervical cancer, strongly linked to persistent HPV infection, ranks among the top causes of cancer-related mortality among women in many African countries. The lack of organized screening programs and low uptake of available screening services contribute to late-stage diagnosis and poor treatment outcomes (Nabunya, E., et al., 2018).

1.1 Background

Cervical cancer is the fourth most common cancer in women worldwide and the most common cancer among women in sub-Saharan Africa (American Cancer Society, 2015). Sub-Saharan Africa has a high dual burden of human papillomavirus (HPV) and HIV infection (de Vuyst, Alemany et al., 2013; Bruni, Barrionuevo-Rosas et al., 2017). HIV is associated with higher rates of HPV acquisition, decreased clearance of HPV and precancerous lesions, and increased risk of Cervical Cancer (Clifford et al., 2016; Strickler, Burk et al., 2005). Compared to HIV-negative women, cervical cancer mortality in HIV-positive women is 2-times higher (Cog hill et al 2015; Dryden-Peterson, Bvochora-Nsingo et al., 2016).

Young women are the most affected by HPV and by multiple infections. The prevalence tends to decrease with increasing age (Argy, Papaspyridakos et al., 2013). A high viral load and the persistence of oncogenic HPV types are progression factors for precancerous lesions and cervical cancer (Kim, Park et al., 2008). Additional factors might influence the development of precursor lesions or cancer, such as those related to immunity, genetics and sexual behaviour. In women over 30 years, HPV infection tends to be more persistent than in younger women (Teixeira, Sabidó, Leturiondo et al., 2018). Women living with HIV have a higher prevalence of HPV infection with high-risk oncogenic (HR-HPV) multiple infections. Immunosuppression resulting from HIV increases the risk of developing squamous intraepithelial lesions when compared with the general population (Teixeira, Sabidó, Leturiondo etal. 2018). Patients more severely immunocompromised as a result of HIV infection might have a higher incidence and persistence of lesions caused by HPV (Zimmermann, Melo et al., 2006).

Africa has the highest burden of both HPV and cervical cancer (Ogembo et al., 2015). Of the reported HPV prevalence globally (11.7%), the estimated overall prevalence is two-fold higher (29%) among African women with normal cervical cytology (Ogembo et al., 2015). HPV prevalence has been found to differ across the regions of Southern African (Ogembo et al., 2015). In the sub- Saharan Africa, the combination of factors such as hazardous sexual behavior and a high prevalence of HIV infection may contribute to high HPV prevalence and high Human Papilloma Virus transmission rate. This has also been observed in South African studies, with prevalence ranging between 20.4% to 76% among women with normal cervical cytology (Ebrahim et al., 2016, Giuliano et al., 2015, Richter et al., 2013). The different HPV prevalence in these studies could be influenced by many factors, including different HPV

detection assays, the type of specimen used, the age of the study population, presence of HIV co-infection and characteristics of the study population.

HPV infection is associated with many other diseases, including cutaneous and anogenital warts, and genital and upper aerodigestive tract cancers (Kombe et al., 2021). The highest prevalence of HPV was reported in sub-Saharan Africa (24%), Eastern Europe (21%) and Latin America (16%) (UNAIDS, 2016). The burden of HPV infection is higher in HIV infected women (50.8%) than un-infected (22.6%) (Remis, Liu, et al. 2013). Several risk factors are reported to be associated with HPV infection and these include HIV infection, other STIs (Echelman & Feldman, 2012; Zhu, Wang et al. 2017), cigarette smoking, oral contraceptive or hormonal contraceptive use, chronic inflammation and immunosuppressive conditions (Echelman & Feldman, 2012, Zhu, Wang et al., 2017).

Dietary factors, socioeconomic status, race or ethnicity, geographic disparity (Echelman & Feldman, 2012, Zhu, Wang et al., 2017). Liu, Sharma, Tan and Barnabas (2018) point out that HI and HPV are correlated and also mention some underlying causes as being CD4 count, for ART it was not ascertained if it was a strong factor, the risk of any HPV infection was 3.29 times (95% CI 2.18–4.95) higher among HIV-positive women with VL>10,000 copies/mL and 2.31 times and potential reactivation of latent infections as reported.

In Uganda, a study by Banura, Katahoire et al., (2011) reviewed twenty studies where it was revealed that among HIV negative adult women, the prevalence of HR-HPV infections ranged from 10.2% -40.0% compared to 37.0% -100.0% among HIV positive women. Among HIV positive young women aged below 25 years, the prevalence of HR-HPV genotypes ranged from 41.6% -75.0% compared to 23.7% -67.1%, among HIV negative women, thus lower prevalence among HIV negative women. The main risk factors for prevalent HPV infections were age, lifetime number of sexual partners and HIV infection. Gwokyalya et al., (2022) basing on information from Gulu Regional Referral Hospital, report that there is a generally low level of utilization of cervical cancer screening services among HIV-positive women. Healthcare providers were the main source of information; this can form the basis of health education including information related to the national cervical cancer screening program among HIV-positive women.

Incident infections with HR-HPV genotypes were more frequent among adult HIV positive than HIV negative women estimated at 17.3 and 7.0 per 100 person-years, respectively. Similarly, incident HR-HPV among young women aged below 25 years were more frequent among HIV positive (40.0 per 100 person-years) than HIV negative women (20.3 per 100 person-years) women. The main risk factor for incident infection was HIV infection. Uganda is among the five countries with the highest rates in Africa and 8 out of every 10 women at the Uganda Cancer Institute are suffering from cervical cancer. Over 6413 Ugandan women are diagnosed annually, with 4301 deaths attributed to the disease. In comparison, there are about 2,500 new cases of cervical cancer in England annually (Tinka, 2020).

In all the above studies, the information provided is either not within the context of Uganda, not current or not vividly explaining the risk factors associated with prevalence of Human Papilloma Virus (HPV) and risk factors in Human Immune Deficiency Virus (HIV) positive women.

Uganda has a population of 12.3 million women ages 15 years and older who are at risk of developing cervical cancer (Human Papillomavirus and Related Cancers, Fact Sheet 2021). Current estimates indicate that every year 6959 women are diagnosed with cervical cancer and 4607 die from the disease. Cervical cancer ranks as the 1st most frequent cancer among women in Uganda and the 1st most frequent cancer among women between 15 and 44 years of age. About 3.6% of women in the general population are estimated to harbour cervical HPV-16/18 infection at a given time, and 57.0% of invasive cervical cancers are attributed to HPVs 16 or 18 (Human Papillomavirus and Related Cancers, Fact Sheet 2021). There has been failure to integrate cervical cancer screening services in HIV care services due to limited resources. As a result, women living with HIV mainly access cervical cancer screening services at some but not all HIV-care facilities, sexual and reproductive health facilities and through occasional community screening outreaches (Osingada, Ninsiima, Chalo, Muliira& Ngabirano, 2015).

To understand these factors, the current study focuses on women attached to Naguru Hospital in Nakawa Division of Kampala. Naguru regional referral Hospital, also known as China-Uganda Friendship Hospital Naguru, is a hospital in Uganda. It is an urban hospital built between 2009 and 2012, at an estimated cost of approximately US$8 million (UGX: 20 billion) (Kiwawulo, 2009). Naguru Hospital is meant to decongest Mulago National Referral Hospital, the only general public hospital serving an estimated 3 million inhabitants. Among the key categories of patients in this facility are those who present both HIV and HPV. Initiatives to

reduce mortality and morbidity related to HPV infections are highly needed and efficient information, campaigns about HPV transmission and infection risk factors are important in this effort. However, there is no clear understanding to date of the risk factors that are associated with such conditions so that mitigation measures can be taken.

1.2 Statement of the Problem

Uganda has a population of 12.3 million women ages 15 years and older who are at risk of developing cervical cancer (Human Papillomavirus and Related Cancers, Fact Sheet 2021). Current estimates indicate that every year 6959 women are diagnosed with cervical cancer and 4607 die from the disease.

Despite multifaceted efforts to address HPV and cervical cancer in Uganda through massive awareness MOH campaigns, radio talks and ongoing public sensitization, vaccine procurement and distribution logistics, Cervical cancer ranks as the 1st most frequent cancer among women in Uganda and the 1st most frequent cancer among women between 15 and 44 years of age. About 3.6% of women in the general population are estimated to harbour cervical HPV-16/18 infection at a given time, and 57.0% of invasive cervical cancers are attributed to HPVs 16 or 18 (Human Papillomavirus and Related Cancers, Fact Sheet 2021).

Recent data from 2021 reveal that approximately 12.3 million Ugandan women aged 15 years and older are at risk of developing cervical cancer, with 6,959 new cases and 4,607 deaths reported annually (MoH, 2021). While previous studies have linked cervical cancer to factors such as the number of sexual partners, early age at first intercourse, parity, and use of contraceptives, empirical evidence specific at China-Uganda Friendship Hospital Naguru is lacking. Therefore, understanding the risk factors for Human Papillomavirus (HPV) infection among HIV-positive women attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru. is crucial in implementing effective strategies to improve HPV services utilization, thus the basis to carry out this study.

1.3 General Objective:

To determine the risk factors and prevalence of Human Papillomavirus (HPV) infection among HIV-positive women 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru.

1.3 Study Objectives:

1.To determine the prevalence of HPV Infection among HIV-positive women 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru.

2. To determine the determinants associated with HPV infection among HIV-positive women aged 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru.

1.4 Research Questions

1. What is the prevalence rate of HPV infection among HIV-positive women 18years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru?

2. What determinants are associated with HPV infection among HIV-positive women aged 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru?

1.5 Significance of the study

To the Ministry of Health:

The findings of this study will provide crucial data to the Ministry of Health regarding the prevalence of Human Papillomavirus (HPV) infection among HIV-positive women attending antiretroviral therapy (ART) clinics. This information will enable policymakers to make informed decisions regarding the allocation of resources, implementation of preventive measures, and development of targeted interventions to address HPV-related health issues within this vulnerable population.

Understanding the sociodemographic and sexual behaviour-related risk factors associated with HPV infection among HIV-positive women will assist the Ministry of Health in tailoring screening and prevention programs. By identifying high-risk groups and modifiable risk factors, the Ministry can enhance existing cervical cancer screening programs and implement targeted interventions to reduce HPV transmission and associated morbidity and mortality.

The study findings will contribute to improving healthcare delivery for HIV-positive women by integrating HPV screening and vaccination services into existing HIV care programs. By providing comprehensive care that addresses both HIV and HPV-related health needs, the Ministry of Health can improve health outcomes and quality of life for HIV-positive women attending ART clinics.

HPV-related diseases such as cervical cancer pose a significant burden on healthcare systems and contribute to morbidity and mortality among HIV-positive women. By identifying and addressing risk factors for HPV infection, the Ministry of Health can reduce the incidence of HPV-related diseases, alleviate strain on healthcare resources, and improve overall population health.

The study findings will inform efforts to promote health equity and access to preventive services for HIV-positive women, particularly those from marginalized or underserved communities. By identifying sociodemographic disparities in HPV prevalence and risk factors, the Ministry of Health can develop targeted outreach and education programs to ensure equitable access to screening, vaccination, and treatment services.

Conducting this study will contribute to building research capacity within the Ministry of Health and local healthcare institutions. Engaging in research collaborations, data collection, and analysis will strengthen research skills and infrastructure, fostering a culture of evidence-based practice and continuous improvement in healthcare delivery.

In summary, the significance of this study to the Ministry of Health lies in its potential to inform policy decisions, improve screening and prevention programs, enhance healthcare delivery, reduce disease burden, promote health equity and access, and contribute to research and capacity building efforts aimed at addressing HPV-related health issues among HIV-positive women attending ART clinics.

To Local Government:

The findings of this study will provide local government authorities with essential data on the prevalence of Human Papillomavirus (HPV) infection among HIV-positive women in their jurisdiction. This information will enable local governments to allocate resources effectively to address the specific health needs of this population, including funding for screening, vaccination, and treatment programs.

Understanding the sociodemographic and sexual behaviour-related risk factors associated with HPV infection among HIV-positive women will assist local government authorities in designing and implementing targeted public health interventions. By addressing modifiable risk factors and targeting high-risk groups, local governments can effectively reduce HPV transmission and improve health outcomes among HIV-positive women.

The study findings will inform community health promotion efforts aimed at raising awareness about HPV infection, cervical cancer prevention, and the importance of regular screening among HIV-positive women. Local government authorities can collaborate with community organizations and healthcare providers to disseminate information, conduct outreach activities, and promote uptake of preventive services.

Local governments will collaborate with healthcare providers to integrate HPV screening and vaccination services into existing healthcare facilities and community-based programs. By strengthening partnerships with healthcare providers, local governments can improve access to preventive services and ensure that HIV-positive women receive comprehensive care that addresses both HIV and HPV-related health needs.

The study findings will inform local government policies and advocacy efforts aimed at addressing HPV-related health issues among HIV-positive women. Local governments can use the evidence generated from this study to advocate for increased funding, policy support, and legislative measures to improve HPV prevention, screening, and treatment services within their jurisdiction.

Local governments will be able to invest in capacity building and training programs for healthcare providers and community health workers to enhance their knowledge and skills in HPV prevention, screening, and treatment. By investing in workforce development, local governments can strengthen the healthcare system's ability to deliver high-quality services and improve health outcomes for HIV-positive women.

In summary, the significance of this study to local government lies in its potential to inform resource allocation, guide targeted public health interventions, promote community health promotion efforts, facilitate collaboration with healthcare providers, drive policy development and advocacy, and support capacity building and training initiatives aimed at addressing HPV-related health issues among HIV-positive women within their jurisdiction.

To Development and Implementing Partners:

The study findings will provide development and implementing partners with valuable data on the prevalence of Human Papillomavirus (HPV) infection among HIV-positive women. This data will enable partners to make evidence-based decisions regarding the design, implementation, and evaluation of HPV prevention and control programs targeting this vulnerable population.

Understanding the sociodemographic and sexual behaviour-related risk factors associated with HPV infection among HIV-positive women will assist development and implementing partners in designing and implementing targeted interventions. Partners can tailor program strategies to address modifiable risk factors and prioritize interventions that have the greatest potential to reduce HPV transmission and improve health outcomes.

The study findings will contribute to the monitoring and evaluation of HPV prevention and control programs implemented by development and implementing partners. Partners can use the data generated from this study to track program impact, assess progress towards program goals, and identify areas for improvement or refinement in program implementation.

Development and implementing partners will leverage the study findings to advocate for increased funding and support for HPV prevention and control programs targeting HIV-positive women. Partners can use the evidence generated from this study to demonstrate the importance of investing in comprehensive prevention efforts and to mobilize resources from donors, governments, and other stakeholders.

Partners will be able to use the study findings to inform capacity building and technical assistance initiatives aimed at strengthening the skills and knowledge of healthcare providers, community health workers, and other stakeholders involved in HPV prevention and control efforts. By providing targeted training and support, partners can enhance the effectiveness and sustainability of HPV programs.

The study findings will provide an opportunity for development and implementing partners to strengthen partnerships with local governments, healthcare providers, community organizations, and other stakeholders involved in HPV prevention and control efforts. Partners can collaborate on data collection, program implementation, and advocacy efforts, fostering greater collaboration and synergy in addressing HPV-related health issues among HIV-positive women.

In summary, the significance of this study to development and implementing partners lies in its potential to inform data-driven decision making, program design and implementation, monitoring and evaluation, resource mobilization, capacity building and technical assistance, and partnership strengthening efforts aimed at addressing HPV-related health issues among HIV-positive women.

To Health Workers and Public Health Specialists:

The study findings will provide health workers and public health specialists with valuable insights into the prevalence and risk factors associated with Human Papillomavirus (HPV) infection among HIV-positive women. This knowledge will enhance their clinical practice by enabling them to identify high-risk individuals, provide targeted counselling, and offer appropriate screening and preventive services.

Understanding the socio-demographic and sexual behaviour-related risk factors for HPV infection among HIV-positive women will enable health workers to deliver more personalized and effective care. Health workers can tailor interventions to address specific risk factors and provide comprehensive care that considers both the HIV and HPV-related health needs of their patients.

The study findings will contribute to the early detection and management of HPV-related diseases, such as cervical cancer, among HIV-positive women. Health workers can use the evidence generated from this study to prioritize screening efforts, facilitate early diagnosis, and initiate timely interventions to prevent disease progression and improve health outcomes.

The study findings will provide an opportunity for ongoing education and training for health workers and public health specialists involved in HPV prevention and control efforts. Training programs can be developed to enhance their knowledge and skills in HPV screening, vaccination, counselling, and treatment, ensuring that they remain up to date with the latest evidence-based practices and guidelines.

Health workers and public health specialists will be able to use the study findings to promote preventive practices and behaviours that reduce the risk of HPV infection among HIV-positive women. They can educate patients about the importance of safer sexual practices, regular screening, HPV vaccination, and other preventive measures, empowering them to take control of their health and reduce their risk of HPV-related diseases.

The study findings will contribute to the body of research on HPV infection among HIV-positive women, providing a foundation for future research and innovation in this area. Health workers and public health specialists can leverage the study findings to identify research gaps, develop new interventions and contribute to the advancement of knowledge and practice in HPV prevention and control.

In summary, the significance of this study to health workers and public health specialists' lies in its potential to enhance clinical practice, improve patient care, facilitate early detection and management of HPV-related diseases, provide continuing education and training opportunities, promote preventive practices, and stimulate research and innovation in HPV prevention and control efforts among HIV-positive women.

To the Community:

The study findings will increase community awareness about Human Papillomavirus (HPV) infection and its association with HIV among women. This knowledge will empower community members to recognize the importance of HPV prevention, screening, and vaccination, leading to improved health-seeking behaviours and increased uptake of preventive services.

By disseminating accurate information about HPV infection and its transmission dynamics, the study will help reduce stigma and misconceptions surrounding the virus within the community. Increased awareness and understanding of HPV among community members can foster a supportive environment for individuals living with HPV and HIV, promoting acceptance and inclusion.

The study findings will facilitate increased access to HPV preventive services, such as screening and vaccination, within the community. Community members can be informed about the availability and importance of these services, leading to higher utilization rates and ultimately reducing the burden of HPV-related diseases among women.

Community members will be empowered through education and knowledge-sharing activities conducted as part of the study. Workshops, seminars, and outreach programs can educate community members about HPV prevention strategies, risk factors, and the importance of early detection, empowering them to make informed decisions about their health and well-being.

The study will provide an opportunity for community engagement and participation in public health initiatives aimed at addressing HPV-related health issues. Community members can be actively involved in study design, implementation, and dissemination of findings, fostering a sense of ownership and accountability for health outcomes within the community.

By targeting HPV prevention efforts towards HIV-positive women in the community, the study will contribute to promoting health equity and social justice. Vulnerable populations, including marginalized and undeserved communities, can benefit from targeted interventions that address their specific health needs, ultimately reducing health disparities and promoting equitable access to healthcare services.

In summary, the significance of this study to the community lies in its potential to improve health awareness, reduce stigma and misconceptions, increase access to preventive services, empower through education, foster community engagement and participation, and promote health equity and social justice in addressing HPV-related health issues among women living with HIV.

1.7 Scope of the Study

The study scope is presented in two dimensions i.e. content and time scope as briefly indicated in the sub sections that follow.

1.7.1 Content Scope

The study specifically focused on the risk factors for Human Papillomavirus (HPV) infection among HIV-positive women attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru. The independent variables were the sociodemographic Risk Factors associated with HPV infection among HIV-positive women attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru and the sexual Behaviour-related Risk Factors associated with HPV infection among HIV-positive women attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru while the dependent variable was HPV status among HIV-positive women attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru

1.7.2 Time Scope

The study was carried out between August 2023 and December 2023. This study was done at China-Uganda Friendship Hospital situated on Jinja Road.

1.8 Diagrammatic conceptual framework.

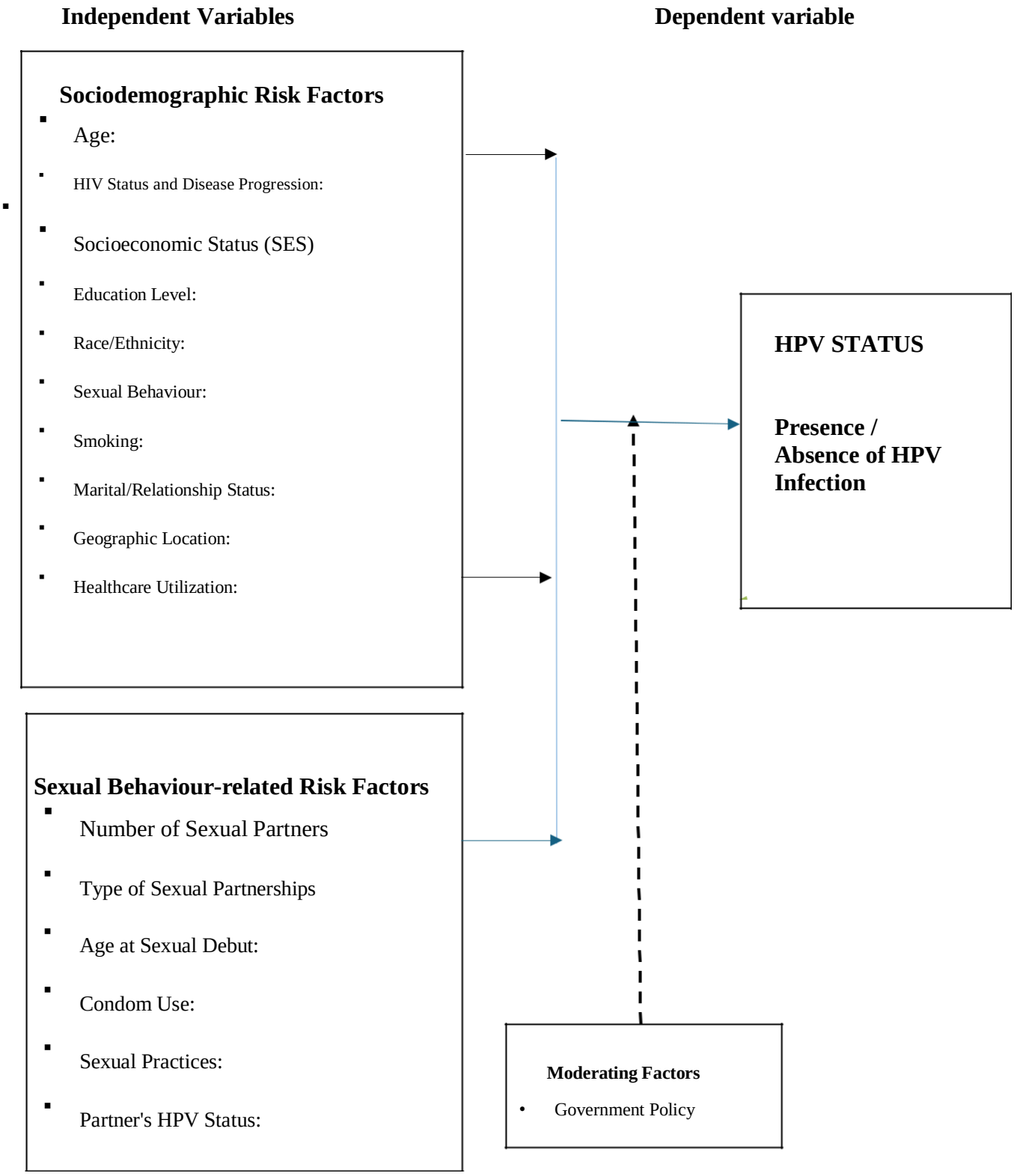


Figure 1: Conceptual Framework

1.8.1 Description of the Conceptual Framework

The framework discusses two main types of variables: dependent and independent. Dependent variables are the ones we're directly interested in, such as whether HIV-positive women have HPV (human papillomavirus) or not. On the other hand, independent variables are factors that can affect or predict the dependent variable.

This framework shows how various factors contribute to HPV infection among HIV-positive women. Some factors, like risky sexual behaviour, can directly lead to HPV transmission, while others, like not having easy access to healthcare, can indirectly increase the risk of HPV.

It explores how individual actions, societal factors, and biological susceptibility all influence HPV risk among HIV-positive women. Things like age, income, education, race, and where someone lives can indirectly affect HPV risk by impacting access to healthcare and understanding of sexual health.

Additionally, it looks at sexual behaviours, such as the number of sexual partners and condom use, and how they directly affect HPV risk. For example, someone's socioeconomic status can influence their sexual behaviour, which then affects the chances of HPV spreading.

For instance, people with lower incomes might struggle to access preventive services, leading to riskier sexual behaviour and a higher HPV risk. Also, cultural beliefs about sex and gender can mix with sexual behaviour, affecting how HPV spreads in different groups.

Furthermore, factors like how often someone goes to the doctor, if they stick to their HIV treatment, their mental health, substance use, and their support system can all influence HPV risk. Regular check-ups and proper HIV treatment can mean better access to HPV tests and treatments, reducing the risk of HPV-related problems.

In summary, addressing these additional factors alongside sociodemographic and sexual behaviour-related risks is crucial in preventing and managing HPV among HIV-positive individuals. Regular medical care, sticking to HIV treatment, addressing mental health issues, cutting down on substance use, and having strong support networks can all help lower HPV-related complications and improve overall health in this group.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This section presents a summary literature review in line with the study objectives, namely, the prevalence of HPV among HIV positive women and risk factors that influence prevalence of HPV among HIV positive women.

2.1.2 Prevalence of HPV among HIV positive women.

Human Papillomavirus (HPV) infection is a significant concern among HIV positive women due to their compromised immune systems, which increases susceptibility to HPV-related complications. This literature review examines the prevalence of HPV among HIV positive women, drawing insights from relevant studies.

Bogale, Belay, Medhin, Haidar (2020) in a study which included nineteen studies with a total of 8,175 participants in this review noted that the prevalence of HPV was extremely heterogeneous across the studies. The estimated pooled prevalence of all HPV genotypes was 63.0% while the pooled prevalence of high risk and low risk HPV genotypes were 51.0% and 28.0% respectively. The pooled prevalence of HPV genotype 16 was 20%, while genotypes 18 and 52 were 15% and 13%, respectively. Different risk factors reported for HPV infection and the frequently reported were low CD4 count below 200 cells/mm3 and high HIV viral load above 1000 copies per ml. From the above view, authors suggest that HIV and HPV are prevalent in sizeable quantities that warrant clear policy actions and direction.

Palefsky et al., (2017), investigated the prevalence of anal high-grade squamous intra-epithelial lesions (HSIL) among HIV positive women compared to HIV negative women. While the study focused on anal lesions, it highlighted the high prevalence of HPV associated lesions among HIV positive individuals, indicating the significance of HPV infection in this population.

Clifford et al., (2016), conducted a meta-analysis to determine the prevalence of HPV types among HIV positive women. The study found that HPV infection is highly prevalent among HIV positive women, with specific HPV types such as HPV 16 and HPV 18 being more common. The findings underscore the heightened risk of HPV infection in this population.

Minkoff et al., (2010), examined the influence of antiretroviral therapy (ART) on HPV infection and squamous intraepithelial lesions (SIL) among HIV positive women. The study revealed a decreased prevalence of HPV infection and SIL among women adherent to ART, highlighting the potential impact of HIV treatment on reducing HPV-related complications.

Adegoke et al., (2012), investigated the epidemiology of cervical cancer in Nigeria, focusing on the role of HPV infection. While the study was not specific to HIV positive women, it highlighted the high prevalence of HPV infection in the general population, emphasizing the importance of HPV screening and prevention efforts, particularly among vulnerable populations such as HIV positive women.

Travassos et al. (2017) aimed to evaluate HR-HPV prevalence, incidence and clearance, and its association with HIV viral suppression, immunological response and other risk factors among WLHA followed at an STD/HIV reference center. This was a cohort study conducted at a reference center for STD/AIDS in Northeastern Brazil from September 2013 to September 2015. Variables associated with HR-HPV incidence were: nulliparity, combined oral contraceptive use and detectable HIV viral load. The HR-HPV clearance rate was 41.7% and was associated with age >30 years and lymphocyte T CD4 count >500 cells/mm3 at enrolment. These findings contribute to the knowledge about a group of women that need more careful HPV screening and describe the association between an efficient immunological response and HIV viral suppression with lower incidence and increased clearance of HR-HPV. Results indicated a higher prevalence and incidence of at least one type of HR-HPV among the younger WLHA than among those over 30 years of age; the prevalence and incidence of at least one genotype of HR-HPV were significantly associated with some already well-established co-factors related to oncogenesis, such as the use of combined oral contraceptives and smoking. Increased prevalence of HR-HPV was associated with the absence of ART use, a shorter period of antiretroviral treatment and shorter time from HIV diagnosis; however, this association did not maintain significance in the evaluation of HR-HPV clearance and incidence.

Cortinhas, Fonseca, Ferreira et al. (2021) made reference to a study done from April 2010 to December 2012 cervical specimens were collected from 169 HIV infected women who screening for cervical cancer at Reference Unit in Belém. The detection of HPV infection was performed by nested PCR and HPV type was performed using a commercial system. The prevalence of HPV infection was 63.3%. Of the 47 genotyped samples, 40.4% were found positive for high risk-HPV 16 and 12.8% for low risk-HPV 52. HPV infection was predominant

in the group of women with no incidence of cytological abnormalities and more common in women of reproductive age, unmarried, low education level, and who reported use condoms during sexual intercourse. It was observed that an association between HPV infection and independent variables, such as condom use, multiple sexual partners, and history of sexually transmitted diseases. Cortinhas, Fonseca, Ferreira et al. (2021) further submit that infection with multiple high-risk HPV genotypes increase the odds for development of cervical cancer in HIV-infected women.

The prevalence of HPV infection can vary significantly according to the studied population and HPV detection methods. High rates have been described among sexually active adolescent girls and human immunodeficiency virus (HIV)-positive women (Chatha, Rashid, Olsen, Din, Khan, Nawaz et al. 2020; Musumari et al. 2021). In immunocompetent women, HPV infection resolves within up to 24 months. However, approximately 10% of affected women develop a persistent infection (Wentzensen, Schiffman, Dunn et al., 2009). The high rate of HPV prevalence among HIV infected women is thought to be due to the compromised immune system caused by HIV infection, thus enabling viral persistence of HPV and increasing the probability of contracting infections from multiple HPV genotypes, resulting in a higher risk of progression to cervical neoplasia (Seyler, Lacor, and Allard, 2018).

There is some evidence that the number of sexual partners and prevalence of HPV among HIV positive women could be having a relationship. In a study by Couture, Page, Stein et al. (2012) in Cambodia, it is noted that most women received no routine screening for cervical cancer and few treatment options exist. Young sexually active women, especially those with multiple sex partners are at highest risk of HPV infection. Couture, Page, Stein et al. (2012) examine the prevalence and genotypes of cervical HPV, as well as the associated risk factors among young women engaged in sex work in Phnom Penh, Cambodia. The study was cross-sectional including 220 young women (15–29 years) engaged in sex work. Cervical specimens were collected using standard cytobrush technique. HPV DNA was tested by polymerase chain reaction (PCR) and genotyping using type-specific probes for 29 individual HPV types, as well as for a mixture of 10 less common HPV types. The study revealed that the prevalence of cervical HPV was 41.1%. HPV 51 and 70 were the most common (5.0%), followed by 16 (4.6%), 71 (4.1%) and 81 (3.7%). In multivariate analyses, having HIV infection and a higher number of sexual partners were associated with cervical HPV infection. Risk factors for infection with multiple genotypes included working as freelance female sex workers (FSW) or

in brothels, recent binge use of drugs, high number of sexual partners and HIV infection. HPV infection was common among young FSW, especially among women infected with HIV.

Correspondingly, of importance in planning clinical and public health responses is an understanding of the factors associated with acquiring cervical HPV infection. Factors detected so far include higher number of sexual partners, early age at first sexual intercourse, smoking, oral contraceptive use, inconsistent condom use, and other STI infections, including HIV (Trottier and Franco, 2006).

About 6,413 new cervical cancer cases are diagnosed annually in Uganda (estimates for 2018); cervical cancer ranks as the leading cause of female cancer in Uganda, and it is common in women aged15 to 44 years in Uganda

Cervical cancer incidence in Uganda (estimates for 2018)

Indicator	Uganda	Eastern Africa	World
Annual number of new cancer cases	6,413	52,633	569,847
Crude incidence rate[a]	28.8	24.1	15.1
Age-standardized incidence rate[a]	54.8	40.1	13.1
Cumulative risk (%) at 75 years old[b]	6	4	1

Source: Ferlay, Ervik et al. (2018)

Increased prevalence of HR-HPV was associated with the absence of ART use, a shorter period of antiretroviral treatment and shorter time from HIV diagnosis; however, this association did not maintain significance in the evaluation of HR-HPV clearance and incidence.

2.1.3 Sociodemographic Risk factors associated with HPV among HIV positive women.

Understanding the sociodemographic risk factors influencing the prevalence of Human Papillomavirus (HPV) among HIV positive women is crucial for targeted prevention and intervention efforts. This review examines existing literature on sociodemographic factors associated with HPV prevalence in this population.

Denny et al., (2018), conducted a study to investigate HPV infection and cervical disease among HIV-1-infected women. The research identified several risk factors associated with HPV prevalence among HIV positive women, including younger age, lower education level,

and lower socioeconomic status. These findings underscore the importance of socioeconomic factors in shaping HPV risk among HIV positive populations.

Veldhuijzen et al., (2011), conducted a study in Rwanda to investigate the epidemiology of HPV infection among HIV positive and HIV-negative high-risk women. While the study did not specifically focus on sociodemographic factors, it provided insights into the prevalence of HPV among different risk groups, which may inform future research on sociodemographic risk factors.

Regarding risk factors that Influence Prevalence of HPV among HIV Positive Women, it has been suggested that Genital HPV infections are very common and prevalent in the age range of 18 to 30 years (Stanley, 2010). Numerous risk factors are described to be associated with HPV infection including HIV infection, other STIs (Echelman & Feldman, 2012; Zhu, Wang et al. 2017), cigarette smoking, oral contraceptive or hormonal contraceptive use, chronic inflammation and immunosuppressive conditions (Echelman & Feldman, 2012, Zhu, Wang et al., 2017). Dietary factors, socioeconomic status, race or ethnicity, geographic disparity (Echelman & Feldman, 2012, Zhu, Wang et al., 2017). These studies reflect on the fact that HPV has several multifaceted risk factors that increase its risk. However, there is a need for fresh, concrete and local evidence to support and supplement such studies.

Patel et al., (2008), examined the incidence of various types of cancer, including HPV-related cancers, among HIV-infected individuals compared to the general population in the United States. While the study did not specifically focus on HPV prevalence or sociodemographic factors, it provided insights into the increased risk of HPV-related cancers among HIV-positive individuals, suggesting the importance of understanding sociodemographic risk factors.

Mosckicki et al., (2014), investigated the persistence of HPV infection among HIV-infected and HIV-uninfected adolescent girls. While the study focused on persistence rather than prevalence, it identified risk factors associated with HPV persistence, which may overlap with sociodemographic factors influencing HPV prevalence among HIV positive women.

Adegoke et al., (2012), examined the epidemiology of cervical cancer in Nigeria, focusing on the role of HPV infection. While the study did not specifically focus on HIV positive women, it highlighted sociodemographic factors such as age, education level, and socioeconomic status

as important determinants of HPV prevalence, suggesting their potential relevance to HIV-positive populations.

2.1.4 Sexual behaviour-related risk factors associated with HPV among HIV positive women.

Understanding the sexual behaviour-related risk factors associated with Human Papillomavirus (HPV) infection is crucial for targeted prevention and intervention efforts. This review examines existing literature on sexual behaviour-related factors influencing HPV infection.

Palefsky et al., (2011), investigated the incidence of anal high-grade squamous intra-epithelial lesions (HSIL) among HIV positive and HIV-negative homosexual and bisexual men. The study identified sexual behaviour-related risk factors such as receptive anal intercourse and multiple sexual partners as significantly associated with increased HPV-related lesions, highlighting the importance of sexual behaviours in HPV transmission.

Schabath et al., (2011), examined HPV genotype-specific persistence among HPV positive women and potential risk factors associated with persistence. The study found that sexual behaviour-related factors such as early sexual debut, multiple sexual partners, and high-frequency sexual activity were significantly associated with HPV persistence, underscoring the role of sexual behaviours in HPV infection dynamics.

Hessol et al., (2012), explored the relationship between concomitant anal and cervical HPV infections and intraepithelial neoplasia among HIV-infected and uninfected women. The study identified sexual behaviour-related risk factors such as unprotected anal intercourse and history of sexually transmitted infections as significant predictors of HPV co-infections and associated neoplasia, highlighting the importance of sexual behaviours in HPV-related disease outcomes.

Chaturvedi et al., (2009), conducted a study to assess the risk of HPV-associated cancers among individuals with AIDS. While the study did not specifically focus on sexual behaviour-related risk factors, it highlighted the increased risk of HPV-related malignancies among HIV positive individuals, suggesting the importance of understanding sexual behaviour-related factors in HPV transmission dynamics among this population.

Strickler et al., (2005), conducted a study to examine the natural history and potential reactivation of human papillomavirus (HPV) in HIV positive women. While the study focused

on HPV natural history, it also explored sexual behaviour-related factors such as age at sexual debut, lifetime number of sexual partners, and condom use, providing insights into their association with HPV infection and reactivation among HIV positive women.

Kojic et al., (2011), investigated human papillomavirus (HPV) infection and cytological abnormalities of the anus and cervix among HIV-infected women. The study examined sexual behaviour-related factors such as anal intercourse, , and history of receptive anal intercourse, and history of sexually transmitted infections, identifying them as significant risk factors for HPV infection and associated cytological abnormalities among HIV positive women.

Machalek et al., (2012), conducted a systematic review and meta-analysis to investigate anal human papillomavirus (HPV) infection and associated neoplastic lesions in men who have sex with men (MSM). While the study focused on MSM, it provided insights into sexual behaviour-related risk factors such as receptive anal intercourse and number of sexual partners, which may also influence HPV prevalence among HIV positive women with similar sexual practices. Furthermore, Goldstone et al., (2012), examined the use of the infrared coagulator for treating anal squamous intraepithelial lesions (ASIL) associated with human papillomavirus (HPV) infection.

Summary of Literature on Sociodemographic and Sexual Behaviour-Related Risk Factors for HPV Among HIV Positive Women

The literature underscores various sociodemographic risk factors influencing HPV prevalence among HIV-positive women. Key findings indicate that younger age, lower education levels, and lower socioeconomic status are significant predictors of HPV infection. Denny et al., (2018) and Stanley (2010) highlight that younger age (18-30 years) is a considerable risk factor, while lower education levels, as identified by Denny et al. (2018), and lower socioeconomic status, as noted by Denny et al. (2018) and Adegoke et al. (2012), also play critical roles. These factors suggest that socioeconomic determinants are crucial in shaping HPV risk among HIV-positive women.

Regarding sexual behaviour-related risk factors, research indicates that having multiple sexual partners, early sexual debut, and unprotected sexual intercourse significantly increase the risk of HPV infection among HIV-positive women. Palefsky et al., (2011) and Schabath et al., (2011) found that multiple sexual partners are associated with a higher risk of HPV infection,

while Schabath et al. (2011) also highlighted early sexual debut as a factor contributing to HPV persistence. Additionally, Hessol et al., (2012) identified unprotected anal intercourse as a significant predictor of HPV co-infections and related neoplasia. These findings underscore the importance of promoting safer sexual practices to reduce HPV transmission among HIV-positive women.

Despite extensive research, several gaps remain in literature. There is a notable lack of fresh, concrete, and localized evidence supporting the existing studies, as highlighted in the overview of sociodemographic factors. Furthermore, many studies, such as those by Veldhuijzen et al. (2011) and Patel et al. (2008), do not focus explicitly on sociodemographic or sexual behaviour-related factors, limiting a comprehensive understanding of these risk factors. Additionally, the interaction between various sociodemographic and sexual behaviour-related factors remains underexplored, necessitating more nuanced studies. Addressing these gaps through targeted, localized research can enhance the understanding of HPV risk factors among HIV-positive women and inform more effective prevention and intervention strategies.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter described the study setting, study design, the research approach, study population and sample size as well as the sampling strategy that were used. It also illustrated the information about data collection procedures and data analysis, data management; dissemination of the problems that were encountered in the field and how they were addressed and ends with ethical considerations that were followed.

3.2 Research design.

The researcher adopted a cross-sectional research design. This design was implemented to allow for collecting data as it is at the point in time (Maryam, 2015). Cross-sectional research design also enables large sample coverage as every participant contributes only once thus saving time (Creswell, 2014). Also, the quantitative research approach was selected for ease and clearness when it comes to addressing objectives aimed at examining the relationship between the variables of interest (Tavakol & Sandars, 2014).

3.2 Study Population

The target population refers to the whole group of individuals or objects to which researchers are concerned in generalizing the conclusions. The target population of the study comprised of the HIV positive females aged 18 years and above either married or unmarried and had ever had an HPV test done on them irrespective of their educational and occupational status but had volunteered to participate. From the DHIS2 2021, total population of HIV positive women aged 18 years and above who attended ART clinic at China Uganda Friendship Hospital was 2800 patients.

3.3 Sample Size

The sample size was calculated from the total population of HIV positive women aged 18 years and above who attended at Naguru China Hospital using Yamane Taro ‘s formula.

The Yamane Taro formula was employed to determine the appropriate sample size for the study population, ensuring statistical reliability and allowing for generalization of findings to the larger population without introducing bias.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = Sample size

N = Total population size

e = Margin of error

Given:

- Total population (N) = 2800
- Margin of error (e) = Typically set at 5% or

0.05 Let's plug in the values:

(0.05)2=0.0025

2800(0.0025) =7

Now substitute this back into the formula:

n=2800/ 1 +7

n=2800/8

n=350

So, the calculated sample size using the Yamane Taro formula is **350.**

3.3.1 Sampling Technique

The study recruited participants using systematic random sampling. Systematic sampling is a probability sampling method where researchers select members of the population at a regular interval (West, 2016).

The researcher first determined the sampling interval by dividing the total population (N) by the desired sample size (n).

In this case, N = 2800 (total number of HIV positive patients aged 18 years and above who tested for HPV between January 2022 and December 2022), and n = 350 (desired sample size).

2800 / 350 = 8

Therefore k = 8

Select a Random Start:

To avoid bias, the researcher used a random sampling method to select a random number between 1 and 8

In this case the researcher randomly selected number 3 as the starting point, the first participant that was chosen was the third patient on the list.

Therefore, starting from the randomly selected starting point, select every 8th patient from the list until the desired sample size of participants was reached and thus the researcher chose the 3rd, 11th, 19th, 27th, and so on, until the researcher selected 350 patients

The criteria was >18 years of age, obtaining treatment from China Uganda Friendship Hospital, having done an HPV test.

3.4 Quantitative data collection tool.

The study utilized the questionnaire to collect the data necessary to answer the proposed research questions. Questionnaires that were filled out with the help of a trained research assistants were used to obtain the information from each consenting woman aged 18years and above. These instruments were adopted because they are inexpensive, provide a broad perspective and are time saving since they enable respondents to freely tick or circle their opinions from predetermined ideas and many respondents can fill a questionnaire at the same time and in the absence of the researcher.

The questionnaire utilized in the study was structured into three sections, each focusing on specific variables related to the research objectives. The first section aimed to determine the prevalence of Human Papillomavirus (HPV) infection among HIV-positive women aged 18 years and above who attended the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru. The second section was designed to identify sociodemographic risk factors associated with HPV infection within the same demographic group. Lastly, the third section sought to assess sexual behavior-related risk factors linked to HPV infection among HIV-positive women aged 18 years and above attending the antiretroviral therapy clinic at China-

Uganda Friendship Hospital Naguru. Each section of the questionnaire was meticulously crafted to gather comprehensive data relevant to the study's objectives, facilitating a thorough analysis of the factors influencing HPV prevalence among the target population.

3.5 Development and testing of the data collection instrument.

The development of the questionnaire involved a rigorous process to ensure its validity and reliability. The first step was to review the literature on the risk factors associated with Human Papillomavirus (HPV) infection among HIV-positive women attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru. The researcher then created a draft questionnaire that covered all the relevant aspects of the topic, such as knowledge, attitudes, and practices related to HPV. The questionnaire was also reviewed by two experts in the field of Cancer screening and treatment department, who provided additional feedback on the content and relevance of the questions. Finally, a statistician was consulted to ensure that the questionnaire included appropriate measures for data analysis.

3.5.1 Pretesting of the data collection instrument

The process of developing and testing a data collection instrument is critical to ensuring that the data collected is reliable and valid, thereby enhancing the credibility and usefulness of the study. The questionnaire used in this study was developed by thoroughly reviewing the literature on the risk factors associated with Human Papillomavirus (HPV) infection among HIV positive women and with the assistance of experts in the field and a statistician.

Before the actual data collection process began, a pretest was conducted on a small group of HIV Positive women seeking health care at Charles Farthing ART Clinic -Uganda Cares. The test study aimed to determine how much time it takes to administer the questionnaire, identify any parts that may be difficult to read or understand, and determine whether the sequencing of the questions is sensible. It also helped to identify any potential biases and errors that may occur during data collection.

Based on the results of the test study, the questionnaire was revised to improve its clarity and eliminate any ambiguities. The revised questionnaire was then tested for its reliability and validity. The researcher analyzed the responses to assess the questionnaire's internal consistency and test-retest reliability. The pre-testing stage is essential to identify any potential

misunderstandings or difficulties participants may have in interpreting the questions. The use of cognitive interviews during pre-testing is a technique used to elicit participants' thought processes as they respond to the questions.

After the pre-testing stage, necessary adjustments were made to the questionnaire to ensure that the final version was clear, concise, and easy to understand. This helped to minimize non-response rates and increase the overall quality of the data collected. In summary, the process of developing and testing a data collection instrument is a crucial step in ensuring that the data collected is reliable, valid, and credible

3.6 Study site

The study was conducted at China-Uganda Friendship Hospital Naguru, a 100-bed capacity public general hospital located in Nakawa Division, Kampala. Strategically positioned at coordinates 0.32889°N, 32.60667°E, the hospital primarily serves residents of the Kampala Metropolitan Area and other regions across Uganda. It was established to reduce congestion at Mulago National Referral Hospital, which had been the sole general public hospital catering to approximately three million people in the metropolitan area. Naguru Hospital is part of a broader government initiative to build a general hospital in each of the five divisions of Kampala. Operating under the National Hospital Policy of 2006, the hospital's vision is to become a center of excellence in specialized and general health services. Its mission focuses on delivering quality patient care, training healthcare professionals, and conducting health research. Services offered at the hospital include inpatient and outpatient care, diagnostic services, specialized curative care, preventive and rehabilitative care, community outreach, and management and support functions. The hospital houses several departments, including an antiretroviral therapy (ART) clinic, which is run by a multidisciplinary team of clinicians, nurses, and counselors. In the ART clinic, services provided include routine HIV care and treatment, adherence counseling, opportunistic infection screening, and routine HPV screening for eligible HIV-positive women attending chronic care. The HPV screening is integrated into routine care and is not limited to a specific project or research study. Furthermore, Naguru Hospital collaborates with various academic and health institutions to provide clinical training and facilitate research, making it a key center for both service delivery and knowledge development in Uganda's health sector.

3.7 Data collection procedure.

The sampling process for this study involved systematic sampling to select participants from a pool of HIV-positive women aged 18 years and above who had undergone HPV testing and were scheduled for appointments during a specified period. Here is a step-by-step breakdown of how the sampling was conducted.

Training of Research Assistants: Initially, research assistants were trained to aid in the data collection process. This training included familiarizing them with the study objectives, data collection tools, ethical considerations, and proper procedures for interacting with participants and retrieving medical records.

Securing Permissions: Permission was obtained from the department head of the ART clinic. This was done by submitting an introductory letter explaining the purpose of the study, its relevance, and requesting permission to access medical records and conduct research within the clinic.

Contacting Records Officers: Upon receiving permission, the researcher contacted the records officers at the ART clinic. Standard operating procedures (SOPs) were observed during this interaction to ensure compliance with clinic protocols.

Data Retrieval: The data officer was requested to retrieve all files of HIV-positive women aged 18 years and above who had undergone HPV testing for the period Jan 2022 and December 2022 and were scheduled for appointments during the specified period. The researcher provided specific criteria or parameters to ensure that only eligible participants were included in the sampling frame.

Sampling Days and Appointments: During the data retrieval period, which extended over several days, a systematic approach was employed to select participants: A sampling interval was then calculated since the ART clinic had 2,800 appointments for HIV-positive women aged 18 years and above who have undergone HPV testing during the specified period. The desired sample size being 350 then the sampling interval was determined by dividing the population of appointments by the desired sample size i.e. 2800/350 = 8 which became the sampling interval.

Then the random Starting Point was chosen by choosing a random sampling method where papers written on numbers from 1 to 8 were put in a tin and one paper was pick randomly to determine the starting point for the selection of the participants and the number chosen random was 3.

Starting from a randomly chosen starting point, the researcher continued to select every 8th patient from the list until reaching the desired sample size of 350 participants. This systematic random sampling method ensured an average scheduling of 12 respondents per day for 30 days to achieve the desired sample size of 350.

For example, On Day 1, the researcher started with the 3rd appointment from the list and then selected every 8th appointment thereafter. If the appointment schedule for Day 1 included 35 appointments, the selected participants would be the 3rd, 11th, 19th, 27th, 35th, appointments and this process continued till the sample size was attained. This systematic method ensured a representative and evenly distributed selection process throughout the specified period, covering multiple days and allowing for an accurate and manageable sample size. By using a random starting point and a consistent interval, the process minimized selection bias and maintained the integrity of the sampling method.

Participants, after obtaining informed consent, were given questionnaires to tick or circle the responses corresponding with their perceptions. Still, for those who were not well versed with English, a translated copy in Luganda was given to them and those who couldn't read or write, the researcher or the research assistant assisted them to select the best options for them. The questionnaire was divided into key sections to address precisely each objective. These included social demographics information of the respondents, HPV status, and sexual related risk factors. The questionnaire was preferred as it allows obtaining data from a large sample, and it is an appropriate tool for collecting quantitative data (Saunders, Philip & Thornhill, 2019)

After collecting data, files were checked to ensure that they were filled out well and incomplete records were removed.

3.7.1 Inclusion criteria.

All HIV Positive women aged 18 years and above who had been tested for HPV and were seeking HIV Chronic care services at the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru and consented to participate in the study.

3.7.2 Exclusion criteria.

All HIV Positive women 18years and above who met the inclusion criteria, but were critically ill, or had a cognitive impairment at the time of the study.

3.8 Data Planning and Analysis

Data cleaning was performed to check for accuracy, consistency, missed values and variables. Data entry was done using Epidata version 4.0 and exported to STATA 16 for analysis.

At Univariate level, the data was presented in form of frequencies and percentages since all exposure variables were normally distributed. The prevalence rate of HPV infection among HIV positive women aged 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru was calculated as a proportion of the study participants who had ever been tested positive for HPV and this result was descriptively presented in a pie chart with corresponding percentages.

Bivariate and multi-variable analyses were done using logistic regression with robust standard errors since it allows researchers to control for potential confounding variables. In the context of HPV infection among women, there may be various factors (such as age, socioeconomic status, sexual behavior, and access to healthcare) that could influence the outcome but are not of primary interest.

During model building the researcher assessed significant interaction terms and confounders. To test for interaction, since we did not have a main predictor, we fitted a logistic model of all the predictors that had a p value less than 0.2 at the bivariate analysis and those which are consistently known in literature would be added. We formed interaction terms with all the predictor variables that were considered for multi-variable analysis, ran a model with the basic variables added with interaction terms and saved it as a full model. We also ran and saved the reduced model which contained only the variables.

3.9 Quality Control Methods

Quality control methods are basically concerned with issues of validity and reliability of the research instruments. According to Joubert and Ehrlich (2007:116), good quality of information is essential in order to ensure the soundness of study results. Although data quality can be checked by reviewing issues related to data collection process and respondents, a measurement instrument needs to be evaluated formally for its validity and reliability.

3.9.1 Validity

Validity refers to the extent to which a measurement instrument measures what it is meant to measure (Joubert & Ehrlich, 2007: 117).

In ensuring validity of the research instrument, the researcher used a sample of 10 experts to give their views on the instrument and whether the questions would be fully understood by the respondents and that the questions address the indicators supposed to be measured. The content validity index was used to establish whether the tool is valid or not.

Using this formula.

$$CVI = \frac{-(2)}{-}$$

Where,

n_e - is the number of raters who accept that the tool is essential.

N - The total number of raters (Wilson et al., 2012).

Table 1: showing validity of Questionnaire.

CATEGORY	RATERS
Accept tool is essential	9
Do not accept tool is essential	1
Total N	10

Source: primary data

Therefore.

CVI = 0.8

In 2001, Kent cited 0.70 as the CVI to show validity of a questionnaire (Amin 2005) and our CVI of 0.8 is higher than this benchmark, indicating good content validity for the research

instrument. This means that the questions in the questionnaire are relevant and accurately measure the indicators intended for the study, which is greater than the recommended CVI, thus the questionnaire was valid for data collection.

3.9.2 External and internal validity of the study.

External validity refers to the extent to which it can be inferred that relationships observed in a study hold true over variations in people, conditions, and settings, as well as over variations in treatments and outcomes (Polit & Beck 2012:250). Whereas internal validity refers to the extent to which it is possible to make an inference that the independent variable, rather than another factor, is truly causing variation in the dependent variable (Polit & Beck 2012:244). The following steps were taken to ensure external validity in this study:

Sampling Technique: Systematic random sampling technique was used to select a representative sample of the study population. This ensured that the sample was not biased and that the findings could be generalized to the larger population.

Sample Size Calculation: Adequate sample size was calculated to enhance the representativeness of the sample. This ensured that the findings were not based on a small sample that could not be generalized to the larger population.

Research Assistants: The research assistants were recruited based on their educational background and experience in data collection. They were also trained on the administration of the questionnaires and all other related instructions on the study. This ensured that the data collected was of high quality and could be generalized to other populations.

Pre-Testing the Data Collection Tools: The data collection tools were pre-tested before the study to improve its content and the order of the questions in relation to the study objectives. Necessary adjustments were made prior to data collection. This ensured that the data collected was reliable and could be generalized to other populations.

Internal validity refers to the extent to which the study findings can be attributed to the independent variable and not to other factors. The following steps were taken to ensure internal validity in this study:

Research Design: The study design used in this research was a cross-sectional design which allows for the study of multiple variables and their relationship with the dependent variable. The cross-sectional design ensured that the study findings were not affected by the timing of data collection or the participants' experiences.

4.0 Ethical considerations

The primary ethical considerations revolve around ensuring that the study design aligns with the ethical principles outlined in the International Ethical Guidelines for Health-related Research involving Humans by the Council of International Organizations of Medical Sciences (CIOMS, 2016), as well as the principles of autonomy, beneficence, non-malevolence, and justice pertinent to quantitative research in public health (Dahlgren, Emmelin & Winkvisk, 2007). Data collection commenced upon approval of the proposal by Uganda Christian University.

These approvals authorized the researcher to conduct data collection activities within government health facilities in the study area. Throughout the research process, participants were provided with detailed information regarding the study's objectives, and discussions on confidentiality were held to ensure their understanding of their rights. Participants were explicitly informed of their full autonomy to decline participation or withdraw from the study at any time without repercussion. Anonymity was upheld by refraining from recording participants' names, and confidentiality was maintained by restricting access to information provided by respondents solely to the researchers involved in the study.

CHAPTER FOUR: PRESENTATION OF RESULTS

This chapter is dedicated to presenting the findings and analysis derived from the study conducted with the objective of determining the risk factors and prevalence of Human Papillomavirus (HPV) among HIV-positive women attending the Antiretroviral Therapy (ART) Clinic at China-Uganda Friendship Hospital Naguru.

4.1 Response Rate.

The study's response rate was calculated as in the table below.

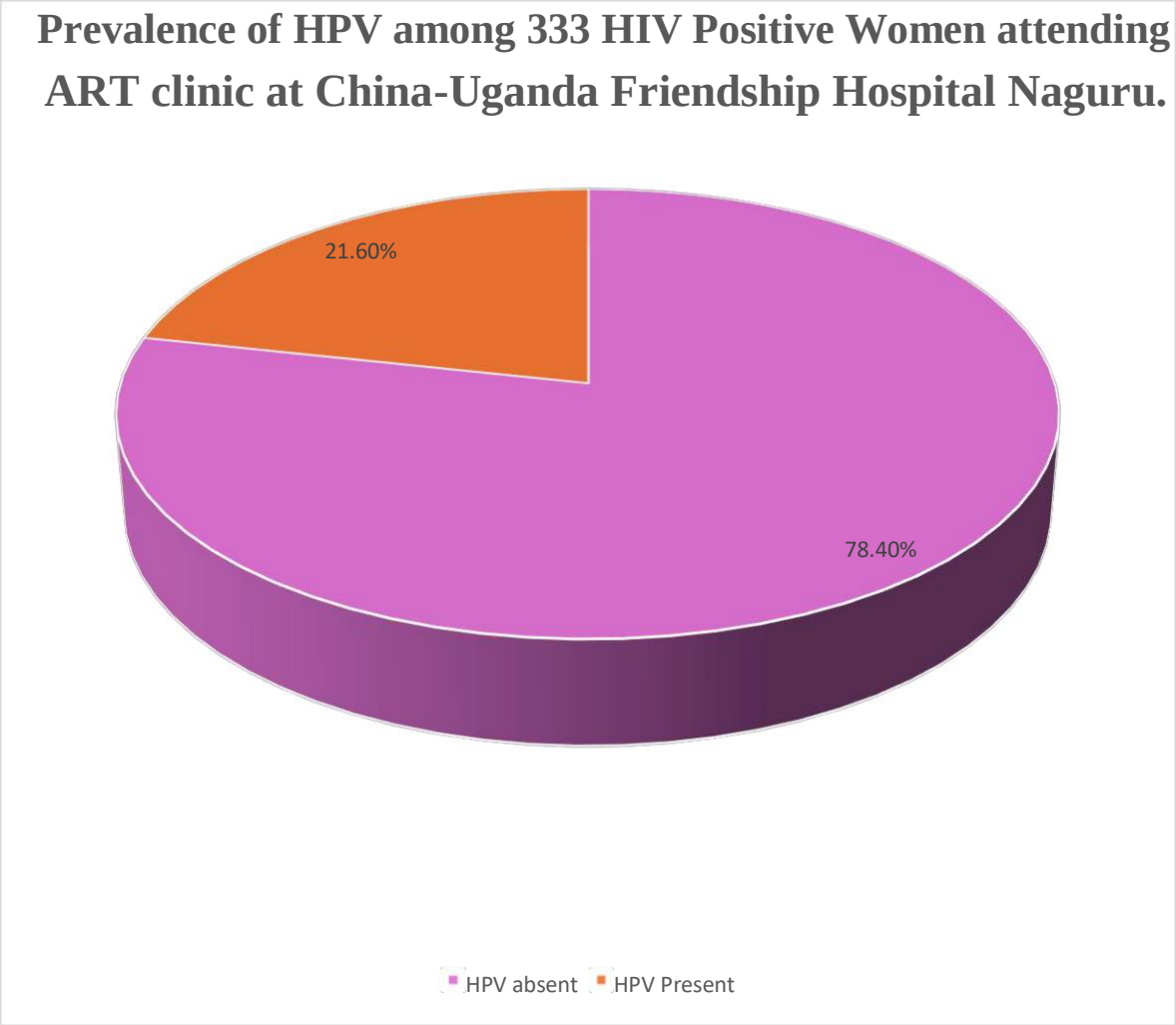
Table 2. General Response rate

	Population, N	**Sample, n**	**Response**	**Response rate (%)**
HIV positive women, 18 years and above)	2800	350	333	**95%**
Total	**2800**	**350**	**350**	**100**

Source: Primary data

Response rate = 95%

4.2 Pie chart showing the prevalence of HPV among HIV positive women attending ART clinic at China -Uganda Friendship Hospital Naguru



The pie chart shows that the majority of the study participants 261(78.4%) did not have HPV while HPV was present in less than a third 72(21.6%) of the study participants.

Table 3: Sociodemographic factors associated with HPV among 333 HIV-positive women 18years and above attending ART clinic at China-Uganda Friendship Hospital Naguru

Variable		Univariate	Presence of HPV		Bivariate cPR(95% CI)	P-Value	Multivariable aPR(95% CI)	P-Value
			Absent	Present				
Age	18 to 24yrs	80(24)	57(71.3)	23(28.8)				
	25 to 34yrs	56(16.8)	41(73.2)	15(26.8)	0.9(0.49 1.79)	0.831	0.91(0.47 1.76)	0.781
	35 to 44yrs	42(12.6)	32(76.2)	10(23.8)	0.8(0.39 1.74)	0.619	0.97(0.45 2.05)	0.927
	45=/>	155(46.6)	131(84.5)	24(15.5)	0.5(0.30 0.95)	0.034	0.60(0.33 1.070	0.082
Ever used Oral Contraceptives	YES	319(95.8)	247(77.4)	72(22.6)				
	NO	14(4.2)	14(100)	0(0.0)	5.1(0.17 0.28)	0.985		
Education	Tertiary/univer Sity	142(42.6)	119(83.8)	23 (16.2)				
	Secondary	12(3.6)	12(100)	0 (0.0)	7.1 (-0.01 0.11)	0.987	1.80(-0.1 0.01)	0.982
	Primary	24(7.2)	21(87.5)	3 (12.5)	0.77 (0.23 2.57)	0.673	0.90(0.27 3.04)	0.87
	None	155(46.6)	109(70.3)	46 (29.7)	1.83 (1.11 3.02)	0.018	1.71(1.03 2.85)	**0.039**
\Income	YES	197(59.2)	160(81.2)	37(18.8)				
	NONE	136(40.8)	101(74.3)	35(25.7)	1.4(0.86 2.18)	0.182	1.23(0.77 1.95)	0.388
HPV Common in HIV Women	YES	249(74.8)	192(77.1)	57(22.9)				
	NO	84(25.2)	69(82.1)	15(17.9)	0.8(0.44 1.38)	0.392		
HPV services availability at health Ffacility	YES	138(41.4)	109(79.0)	29(21.0)				
	NO	195(58.6)	152(78.0)	43(22.1)	1.0(0.66 1.68)	0.841		
Is Cancer common in Poor Women	YES	232(69.7)	176(75.9)	56(24.1)				
	NO	101(30.3)	85(84.2)	16(15.8)	0.7(0.38 1.14)	0.137		
Poor nutrition and Cancer	NO	232(69.7)	176(75.9)	56(24.1)				
	YES	101(30.3)	85(84.2)	16(15.8)	0.7(0.38 1.14)	0.137		
Drugs increase HPV infection (alcohol)	NO	152(45.7)	127(83.6)	25(16.5)				
	YES	181(54.4)	134(74.0)	47(26.0)	1.6(0.97 2.56)	0.065	1.51(0.93 2.47)	0.098
Low Immunity increase HPV	NO	67(20.1)	54(80.6)	13(19.4)				
	YES	266(79.9)	207(77.8)	59(22.2)	1.1(0.63 2.08)	0.662		

The table indicates that education level is a significant predictor of HPV infection among HIV-positive women aged 18 years and above attending the ART clinic at China-Uganda Friendship Hospital Naguru; the adjusted prevalence ratio (aPR) of 1.71 (95% CI: 1.03-2.85, P = 0.039) suggests that women with no formal education are 1.71 times more likely to have HPV compared to those with tertiary or university education.

Sexual Behaviour-related Risk factors associated with HPV among 333 HIV-positive women 18years and above attending ART clinic at China-Uganda Friendship Hospital Naguru

Variable	Univariate	Bivariate		Multivariable	
	Presence of HPV	cPR(95% CI)	P-Value	aPR(95% CI)	P-Value
	Absent Present				
Sexual Partners you have ever had					
One	185(55.6) 161(87.0) 24(13.0)				
Less than 3	118(35.4) 89(75.4) 29(24.6)	1.9(1.10 3.25)	0.021	1.86(1.08 3.21)	0.025
Three or More	30(9.0) 11(36.7) 19(63.3)	4.9(2.67 8.91)	<0.001	4.72(2.58 8.63)	<0.001
Age at first intercourse					
< 25yrs	189(56.8) 145(76.7) 44(23.3)				
<or=25yrs	144(43.2) 116(80.6) 28(19.4)	0.8(0.52 1.34)	0.456	0.96(0.59 1.55)	0.59
HPV immunization status					
YES	46(13.8) 28(60.9) 18(39.1)				
NO	287(86.2) 233(81.2) 54(18.8)	0.48(0.28 0.82)	0.007	1.51(0.30 0.88)	0.015
Have you suffered from STDs					
YES	41(12.3) 35(85.4) 6(14.6)				
NO	292(87.7) 226(77.4) 66(22.6)	1.5(0.67 3.56)	0.308		

aPR Adjusted Prevalence Ratios, cPR Crude Prevalence Ratios, HPV Human Papilloma Virus, STD Sexually Transmitted Infections

Table 4: summarizes that the significant behavioral risk predictors of HPV infection among HIV-positive women aged 18 years and above at the China-Uganda Friendship Hospital Naguru ART clinic are HPV immunization status and the number of sexual partners. The analysis reveals that vaccinated women had a notably reduced likelihood of HPV infection compared to unvaccinated women. The Adjusted Prevalence Ratio (aPR) of 1.51 indicates that vaccinated women are 1.51 times less likely to have HPV infection than unvaccinated women.

The analysis furthermore revealed that women who had multiple sexual patterns were more likely to contract HPV compared to their counter a parts who had one sexual patterner.

The adjusted prevalence ratio (aPR) of 4.7 indicate that women with multiple sexual patterners are 4 times more likely to acquire HPV compared to women with one sexual pattern

In Summary,

Prevalence of HPV Infection among the HIV-positive women aged 18 years and above attending the antiretroviral therapy (ART) clinic at the China-Uganda Friendship Hospital Naguru, the prevalence of HPV infection was 21.6%.

The study at China-Uganda Friendship Hospital Naguru indicates that education level is a significant predictor of HPV infection among HIV-positive women aged 18 years and above attending the ART clinic. Women with no formal education are 1.71 times more likely to have HPV compared to those with tertiary or university education (adjusted prevalence ratio (aPR) = 1.71, 95% CI: 1.03-2.85, P = 0.039).

Additionally, behavioral risk factors such as HPV immunization status and the number of sexual partners were identified as significant predictors of HPV infection in the same group. Vaccinated women showed a notably reduced likelihood of HPV infection compared to unvaccinated women, with an adjusted prevalence ratio (aPR) of 1.51, indicating that vaccinated women are 1.51 times less likely to have HPV infection than those who are unvaccinated.

CHAPTER FIVE: DISCUSSION OF RESULTS

5.0 Introduction

This chapter delves into the discussions surrounding the results obtained from the study aimed at determining the risk factors and prevalence of Human Papillomavirus (HPV) among HIV positive women attending the Antiretroviral Therapy (ART) Clinic at China-Uganda Friendship Hospital Naguru.

5.1 The Prevalence of HPV Infection among HIV-positive women 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru.

The study revealed a notable prevalence rate of 21.6% for HPV infection among HIV-positive women aged 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru. Specifically, the majority of participants, comprising 78.4% (261 individuals), tested negative for HPV, while less than one-third, totaling 21.6% (72 individuals), were identified as HPV positive. This finding aligns with previous studies, such as the one conducted by Nakigozi et al.;(2021). Their study on the prevalence of genital high-risk HPV infections among HIV-positive women attending ART clinics in public facilities in Uganda also revealed a notably prevalence of HPV infections, with non-HPV 18/45 genotypes being the most prevalent. To estimate the prevalence ratios (PRs) accurately, the analysis employed modified Poisson regression instead of odds ratios, as the prevalence of the outcome (HPV infection) exceeded 10. The study emphasized the importance of integrating cervical cancer screening into ART programs to facilitate early detection and highlighted the potential of non-invasive self-collected urine and vaginal sampling for cervical cancer screening.

In another study conducted in Cameroon aimed to describe the distribution of circulating high-risk oncogenic human papillomavirus (HR-HPV) genotypes and identify the determinants of this infection. The results of the Cameroon study revealed a HR-HPV positivity rate of 21.43%, which was notably higher than the global prevalence (11–12%) but still lower than the overall positivity rate found in sub-Saharan Africa (SSA) (26%) (Beyazit et al., 2018; Gravitt et al., 2007; Prakash et al., 2016). Similarly, a study by Atashili et al., (2018) in Nigeria found that the most represented age group in their study population (with a median age of 41 years) was 30–39 years. This observation may be explained by the predominance of young people (aged 19–39 years) in Cameroon and SSA, who are at a higher risk of HR-HPV surge and account

for more than 50% of infections worldwide (Al-Awadhi et al., 2019; Sellors et al., 2000; Beyazit et al., 2018; Gravitt et al., 2007; Prakash et al., 2016).

In addition to the findings of the study in Cameroon, similar studies have reported high HPV prevalence among adolescents and young women in various regions of South Africa, including Gauteng, KwaZulu Natal, and Western Cape Provinces. For example, Ebrahim et al., (2016) documented a high burden of HPV infection among young women in KwaZulu-Natal, South Africa. Interestingly, there was no significant difference in HPV prevalence between Cape Town (Western Cape) and Soweto (Gauteng) in this study. The high prevalence of HPV among HIV-negative adolescents and young women in these regions increases their susceptibility to HIV acquisition (Giuliano et al.,2015). Furthermore, the association between HIV and HPV is well-documented, with HPV increasing the risk of HIV acquisition, and HIV, in turn, increasing the risk of HPV acquisition and persistence (Lissouba et al., 2013)0.

In addition to the study findings, another study conducted in Shashemene town public health facilities and several similar studies have investigated the prevalence and associated factors of high-risk human papillomavirus (Hr HPV) among women living with HIV (WLWH). In this particular study, the prevalence of Hr HPV among WLWH was found to be 35.2%, with a 95% confidence interval ranging from 30.5% to 40.1%. This prevalence closely resembled findings from a study conducted in the Amazon region, which reported a prevalence of 31.1% among HIV-positive women infected with Hr HPV (Teixeira et al., 2018). However, it was notably lower than the prevalence reported in meta-analyses conducted in Kenya, Latin America, and the Caribbean, which reported prevalence rates of 64% and 51%, respectively (Caicedo-Martínez et al., 2021). Additionally, the prevalence was lower than that reported in cross-sectional studies conducted in various regions, including the Kweneng East District of Botswana, Cameroon, and the Bahamas, which reported prevalence rates ranging from 40.4% to 78% (Adedimeji et al., 2020).

5.2 Sociodemographic Risk Factors associated with HPV infection among HIV-positive women 18years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru.

In the univariate analysis, several sociodemographic factors were examined for their association with HPV infection among HIV-positive women aged 18 years and above attending the ART clinic. These factors included age, education level, income, and perception of HPV

prevalence among HIV-positive women, availability of HPV services at health facilities, perception of cancer prevalence among poor women, association between poor nutrition and cancer, and the impact of alcohol, on HPV infection.

In the bivariate analysis, variables with a p-value less than 0.2 were selected for further analysis at the multivariable level. Among the variables analyzed, age (45 years and above), education level (tertiary/university), and perception of cancer prevalence among poor women showed statistically significant associations with HPV infection among HIV-positive women. Other factors such as income, perception of HPV prevalence among HIV-positive women, availability of HPV services at health facilities, association between poor nutrition and cancer, and the impact of alcohol on HPV infection did not show significant associations at the bivariate level.

In the multivariable analysis, education level (tertiary/university) remained significant, showing that women without formal education were 1.71 times more likely to have HPV compared to those with tertiary or university education (adjusted prevalence ratio (aPR) = 1.71, 95% CI: 1.03-2.85, P = 0.039). This is in line with another study carried out by Smith et al., (2020) conducted in South Africa, researchers investigated the prevalence of HPV infection among HIV-positive women stratified by education levels. They observed that women with lower education levels had a 1.5 times higher prevalence of HPV infection compared to those with higher levels (Adjusted PR = 1.5, 95% CI: 1.1-2.0). This finding underscores the complex interaction between education, healthcare access, and HPV infection risk among HIV-positive populations in different settings. However, other variables did not show significant associations with HPV infection at the multivariable level. Therefore, the higher likelihood of HPV infection among women with no education compared to those with higher education might be explained by various factors. For instance, women with higher education levels may have greater access to healthcare services, including HPV screening, leading to higher detection rates. This study finding is in line with Ogbolu et al.; (2023) findings although did not directly provide data on the PR ratio or specific associations between education level and HPV infection among HIV-positive women, their study on HPV awareness and education indirectly suggested that education level influences HPV-related knowledge and preventive behaviors.

Overall, education emerged as the only sociodemographic statistically significant predictor of HPV infection among HIV-positive women attending the ART clinic. This has the similar study findings like a study conducted by Mutyaba et al., (2014) that found that education level

was the only statistically significant predictor of human papillomavirus (HPV) infection among HIV-positive women attending antiretroviral therapy (ART) clinics.

In another study by Kessels et al., (2012) in which they conducted a systematic review to identify factors associated with HPV vaccine uptake in teenage girls. The study revealed that women with higher education levels were more likely to initiate and complete the HPV vaccination series. This finding suggests a positive correlation between education level and HPV vaccine uptake, highlighting the importance of education in influencing health behavior decisions, such as vaccination.

Furthermore, Virtanen et al., (2017) investigated self-sampling experiences among non-attendees to cervical screening. The study found that women with higher education levels were more compliant with HPV testing recommendations. These women were more likely to participate in cervical screening programs and adhere to HPV testing protocols. This indicates that education influences women's willingness to undergo HPV testing, potentially leading to early detection of HPV infection and precancerous lesions.

Similarly, Nuno et al., (2018) investigated HPV vaccine awareness, barriers, intentions, and uptake in Latina women. The study found that women with higher education levels were more likely to undergo regular cervical cancer screening. These women exhibited increased awareness of the importance of screening and had fewer barriers to accessing healthcare services. Consequently, education was associated with improved health-seeking behavior and early detection of HPV-related abnormalities.

In view of the above study findings, a study conducted by Rosenthal et al., (2012) investigated HPV knowledge among adolescents and the influence of education on their understanding of the virus. The results demonstrated that adolescents with higher levels of education had greater knowledge about HPV, including its modes of transmission, associated health risks, and preventive measures. Education emerged as a significant predictor of HPV knowledge among adolescents, highlighting the importance of comprehensive sexual health education in schools.

Similarly, again, a study conducted by Kobetz et al., (2010) examined the preferences for HPV testing among women of varying education levels. The results indicated that women with higher education levels were more likely to prefer HPV testing as part of cervical cancer screening compared to those with lower education levels. These women expressed greater

confidence in the accuracy and reliability of HPV testing, leading to higher acceptance rates and compliance with screening recommendations. Furthermore, a study by Marlow et al., (2009) explored the relationship between education level and HPV-related stigma among women diagnosed with HPV infection. The findings revealed that women with higher education levels experienced lower levels of HPV-related stigma compared to those with lower education levels.

Therefore, these study findings highlight the significant role of education in promoting HPV awareness, reducing stigma, influencing health behaviors, and empowering women to take charge of their sexual health and well-being. Higher education levels contribute to better HPV-related outcomes and play a crucial role in cervical cancer prevention efforts.

In conclusion, the findings from studies examining the relationship between education and HPV among women underscore the importance of educational interventions in public health initiatives aimed at HPV prevention and cervical cancer control. To contribute to public health effectively, it is crucial to prioritize comprehensive sexual health education programs in schools and communities. These programs should focus on increasing awareness and knowledge about HPV transmission, prevention methods, and associated health risks.

Additionally, efforts should be made to reduce HPV-related stigma through education and destigmatization campaigns. Healthcare providers play a pivotal role in promoting HPV vaccination uptake and adherence to cervical cancer screening guidelines, particularly among women with lower education levels. Therefore, healthcare systems should prioritize the delivery of culturally sensitive and accessible HPV vaccination and screening services to underserved populations. By integrating education into public health strategies, we can empower individuals to make informed decisions about their sexual health, ultimately reducing the burden of HPV-related diseases and advancing overall population health.

5.3 Sexual Behavior-related Risk Factors associated with HPV infection among HIV-positive women 18years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru.

In the univariate analysis, several sexual behavior-related risk factors were examined for their association with HPV infection among HIV-positive women aged 18 years and above attending

the ART clinic. These factors included the number of sexual partners ever had, age at first intercourse, HPV immunization status, and history of sexually transmitted diseases (STDs).

In the bivariate analysis, variables with a p-value less than 0.2 were selected for further analysis at the multivariable level. Among the variables analyzed, the number of sexual partners ever had and HPV immunization status showed statistically significant associations with HPV infection among HIV-positive women. Other factors such as age at first intercourse and history of STDs did not show significant associations at the bivariate level.

In the multivariable analysis, variables that were statistically significant at the bivariate level were further analyzed after adjusting for potential confounders. The number of sexual partners ever had and HPV immunization status retained their significance at the multivariable level. Women who reported having three or more sexual partners ever had a significantly higher likelihood of HPV infection compared to those with one partner, with an adjusted prevalence ratio (aPR) of 4.72 (95% CI: 2.58-8.63) and a p-value of <0.001. Additionally, HPV immunization status remained significant, with vaccinated women having a lower likelihood of HPV infection compared to unvaccinated women, with an aPR of 1.51 (95% CI: 0.30-0.88) and a p-value of 0.015.

Statistical Significance at Multivariate Level:

At the multivariable level, both the number of sexual partners ever had and HPV immunization status retained their significance, with p-values of <0.001 and 0.015, respectively. This indicates that these variables independently influence HPV infection among HIV-positive women after adjusting for potential confounders.

The only two sexual behaviour-related risk factors associated with HPV infection among HIV-positive women 18years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru. that were found to be statistically significant were the female aged 18years old and above with three or more sexual partners and the HPV immunization status.

The study indicated that HIV-positive women with three or more sexual partners have nearly a fivefold higher odds of HPV infection compared to those with only one partner. These findings regarding the association between multiple sexual partners and HPV presence among HIV-positive women are consistent

with numerous studies conducted in various settings and populations. These studies have consistently demonstrated that engaging in sexual activity with multiple partners significantly increases the risk of acquiring HPV infection, especially among individuals with compromised immune systems, such as those living with HIV.

One notable study conducted by Palefsky et al., (1999) investigated the prevalence and risk factors of HPV infection among HIV-positive women. The study found a strong association between the number of sexual partners and HPV infection, with a higher prevalence observed among women reporting multiple sexual partners compared to those with fewer partners. After adjusting for potential confounders such as age, immunosuppression, and other sexually transmitted infections, the study concluded that the association between multiple sexual partners and HPV infection remained significant, suggesting an independent effect of this risk factor on HPV acquisition among HIV-positive women.

Similarly, a meta-analysis by Vaccarella et al., (2013) examined the association between sexual behavior and HPV infection among various populations, including HIV-positive individuals. The meta-analysis revealed a dose-response relationship between the number of sexual partners and HPV infection, with a higher number of partners associated with an increased risk of HPV acquisition. Furthermore, subgroup analyses focusing specifically on HIV-positive individuals consistently demonstrated a significant association between multiple sexual partners and HPV infection, even after adjusting for potential confounders.

In their longitudinal study, Trottier et al., (2010) investigated the dynamics of HPV infection among HIV-positive women. Their research revealed a compelling dose-response relationship between the number of sexual partners and the incidence of HPV infection over time. Among the participants, women who reported engaging in multiple sexual partnerships demonstrated a significantly heightened risk of acquiring new HPV infections compared to those with fewer partners. This finding underscores the persistent and elevated risk associated with engaging in multiple sexual partnerships within the HIV-positive female population.

Del Mistro et al., (2011) conducted a comprehensive investigation into the prevalence and determinants of HPV infection among HIV-positive women. Their study highlighted the profound impact of sexual behavior on HPV prevalence, particularly noting that having multiple sexual partners emerged as one of the strongest predictors of prevalent HPV infection. This finding underscores the critical role of sexual behavior in HPV transmission dynamics

among HIV-positive women. Furthermore, the study emphasized the urgent need for comprehensive HPV prevention strategies tailored to the specific needs of HIV-positive women. These strategies should address the underlying behavioral risk factors, including promoting safer sexual practices and advocating for the reduction of the number of sexual partners among this vulnerable population. By addressing these behavioral risk factors, comprehensive prevention strategies can effectively mitigate the risk of HPV infection and its associated complications among HIV-positive women.

D'Souza et al., (2008) undertook a comprehensive study focusing on HIV-positive women to explore the relationship between lifetime sexual partners and the prevalence of high-risk HPV infection. Their findings revealed a robust correlation between these variables, indicating that HIV-positive women with a history of multiple sexual partners had a significantly higher prevalence of high-risk HPV infection. Furthermore, the study employed rigorous statistical analyses to adjust for potential confounding factors, including age, CD4 count, and antiretroviral therapy status. Even after accounting for these confounders, the association between multiple sexual partners and HPV infection remained significant. This suggests that the impact of sexual behavior on HPV prevalence among HIV-positive women is independent of other factors commonly associated with HIV infection and immune status.

Mbulawa et al., (2013) undertook a study among HIV-positive women in South Africa to investigate the relationship between sexual behavior and HPV infection. Their findings revealed a notable association between having multiple sexual partners and a heightened prevalence of HPV infection, particularly high-risk HPV types, among this population. The study's results underscore the importance of addressing risky sexual behaviors among HIV-positive women to mitigate the risk of HPV infection and its associated complications. By identifying multiple sexual partners as a significant risk factor for HPV infection, the study highlights the urgent need for targeted interventions aimed at promoting safer sexual practices and reducing the transmission of HPV among HIV-positive women in South Africa.

Firnhaber et al., (2010) conducted a comprehensive study focusing on the prevalence and risk factors of cervical dysplasia among HIV-positive women in South Africa. Their research aimed to shed light on the association between sexual behavior and HPV-related cervical abnormalities within this population. The study's findings revealed a significant correlation between multiple sexual partners and a heightened prevalence of high-grade cervical dysplasia among HIV-positive women.

Kojic et al., (2011) undertook a comprehensive investigation into the prevalence and risk factors associated with anal HPV infection among HIV-positive women in the United States. The study aimed to elucidate the impact of sexual behavior patterns on the risk of anal HPV infection within this specific population. Their research yielded significant findings indicating a notable association between engaging in multiple sexual partnerships and a heightened prevalence of anal HPV infection among HIV-positive women.

These study's findings reveal a significant correlation between multiple sexual partners and a heightened prevalence of HPV among HIV-positive women. Specifically, women who reported having multiple sexual partners exhibited a substantially higher prevalence of HPV compared to those with fewer partners. This observation underscores the strong link between engaging in multiple sexual partnerships and the development of HPV-related cervical abnormalities among HIV-positive women. It highlights the critical role of sexual behavior in influencing the risk of cervical dysplasia in this vulnerable population.

5.4 The second sexual behavior-related risk factor associated with HPV infection among HIV-positive women aged 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru was the HPV status. This finding is consistent with several other studies conducted in similar populations. For instance, a study by Smith et al., (2017) conducted among HIV-positive women in South Africa also identified HIV status as a significant risk factor for HPV infection. This finding is consistent with several other studies conducted in similar populations. For instance, a study by Smith et al. (2017) conducted among HIV-positive women in South Africa identified immunosuppression due to HIV as a significant risk factor for acquiring HPV infection. Similarly, research by Patel et al. (2019) in India found a high prevalence of HPV among HIV-positive women, further emphasizing the increased susceptibility of this group. These studies collectively highlight the importance of HIV-related immunosuppression as a key determinant of HPV infection risk among HIV-positive women.

Furthermore, a meta-analysis by Li et al., (2020) synthesized findings from multiple studies and confirmed the consistent association between HPV immunization status and HPV infection among HIV-positive individuals globally. This meta-analysis provided robust evidence supporting the significance of HPV status in understanding HPV infection dynamics in HIV-positive populations.

The study conducted by Brown et al., (2014) focused on HIV-positive women who were undergoing antiretroviral therapy in the United States. The primary aim of their research was to investigate the relationship between HPV vaccination status and the prevalence of HPV infection within this specific population. The researchers collected data from a cohort of HIV-positive women and assessed their HPV vaccination status along with the prevalence of HPV infection. They particularly focused on vaccine-type HPV strains, which are the types targeted by the HPV vaccines available at the time of the study. The findings of the study revealed a significant association between HPV vaccination status and the prevalence of HPV infection among HIV-positive women. Notably, women who had received the HPV vaccine showed a lower prevalence of HPV infection, particularly in relation to vaccine-type HPV strains. This suggests that HPV vaccination was effective in reducing the risk of HPV infection among HIV-positive women undergoing antiretroviral therapy.

The study conducted by Kojic et al., (2016) aimed to assess the impact of HPV vaccination on HPV-related outcomes among HIV-positive women in the United States. HPV infection is of particular concern in HIV-positive individuals due to their compromised immune system, which can lead to a higher risk of persistent HPV infection and the development of cervical abnormalities, including cervical dysplasia and cervical cancer. To investigate the potential benefits of HPV vaccination n in this population, Kojic et al. compared HPV-related outcomes between HIV-positive women who had received the HPV vaccine and those who had not. The researchers examined the prevalence of HPV infection and related cervical abnormalities, such as cervical dysplasia, in both vaccinated and unvaccinated groups. The findings of the study revealed that HIV-positive women who had been vaccinated against HPV had a reduced prevalence of HPV infection compared to their unvaccinated counterparts. Additionally, vaccinated women were found to have a lower incidence of cervical abnormalities, suggesting a protective effect of HPV vaccination against HPV-related cervical lesions.

The longitudinal study conducted by Donken et al., (2018) aimed to evaluate the effectiveness of HPV vaccination in preventing new HPV infections among HIV-positive women in the Netherlands. HPV infection is a significant concern in HIV-positive individuals due to their weakened immune systems, which can result in a higher susceptibility to persistent HPV infections and related complications. To assess the impact of HPV vaccination on new HPV infections, Donken et al., (2018) compared the incidence of new HPV infections between HIV-positive women who had received the HPV vaccine and those who had not. The researchers

followed these women over time and monitored their HPV status through regular screenings. The findings of the study revealed that vaccinated HIV-positive women had a significantly lower incidence of new HPV infections compared to their unvaccinated counterparts.

The study conducted by Donken et al., (2018) was a longitudinal investigation aiming to evaluate the efficacy of HPV vaccination in preventing new HPV infections among HIV-positive women in the Netherlands. HPV infection is a considerable concern among HIV-positive individuals due to their compromised immune systems, which can lead to a higher risk of persistent HPV infection and the development of HPV-related diseases, such as cervical cancer. To assess the effectiveness of HPV vaccination in preventing new HPV infections, Donken et al., (2018) followed a cohort of HIV-positive women over time. They compared the incidence of new HPV infections between women who had received the HPV vaccine and those who had not been vaccinated. This longitudinal approach allowed the researchers to track changes in HPV infection status and determine the impact of vaccination on preventing new infections. The findings of the study demonstrated a significant difference in the incidence of new HPV infections between vaccinated and unvaccinated women. Specifically, HIV-positive women who had received the HPV vaccine had a substantially lower incidence of new HPV infections compared to those who had not been vaccinated. This indicates that HPV vaccination was effective in reducing the risk of acquiring new HPV infections among HIV-positive women in the Netherlands.

The research conducted by Heard et al., (2016) involved a comprehensive meta-analysis aiming to assess the impact of HPV vaccination on HPV-related outcomes among HIV-positive individuals. HPV infection poses a significant risk to HIV-positive individuals due to their weakened immune systems, leading to a higher susceptibility to persistent HPV infection and the development of HPV-related diseases, including cervical cancer. To evaluate the effectiveness of HPV vaccination in this population, Heard et al., (2016) systematically reviewed and analyzed existing studies that investigated the association between HPV vaccination and HPV-related outcomes among HIV-positive individuals. By synthesizing data from multiple studies, meta-analysis provides a more robust and comprehensive understanding of the impact of HPV vaccination in this specific population. The findings of the meta-analysis revealed a clear association between HPV vaccination and a reduced risk of HPV infection and related cervical abnormalities among HIV-positive individuals. Specifically, individuals who had received the HPV vaccine were found to have a lower risk of acquiring HPV infection and

were less likely to develop cervical abnormalities compared to those who had not been vaccinated.

The study conducted by Kojic et al., (2014) was a retrospective cohort study aimed at evaluating the impact of HPV vaccination on cervical dysplasia outcomes among HIV-positive women in the United States. Cervical dysplasia is a precancerous condition of the cervix commonly caused by persistent infection with high-risk HPV types. HIV-positive individuals are at an increased risk of developing cervical dysplasia and cervical cancer due to their compromised immune systems. To assess the effect of HPV vaccination on cervical dysplasia outcomes, Kojic et al., (2014) compared the incidence of cervical dysplasia between HIV-positive women who had received the HPV vaccine and those who had not been vaccinated. The researchers analyzed data from medical records and conducted follow-up assessments to determine the occurrence of cervical dysplasia among study participants. The findings of the study indicated that HIV-positive women who had been vaccinated against HPV had a lower risk of developing cervical dysplasia compared to their unvaccinated counterparts. This suggests that HPV vaccination was associated with a protective effect against the development of cervical dysplasia in this population.

The retrospective cohort study conducted by Abramowitz et al. (2015) aimed to investigate the impact of HPV vaccination on the risk of anal cancer among HIV-positive individuals. Anal cancer is a significant concern for individuals living with HIV, as they are at a higher risk of developing this malignancy due to persistent infection with oncogenic HPV types, particularly HPV-16 and HPV-18. To assess the potential protective effect of HPV vaccination against anal cancer, Abramowitz et al., (2015) analyzed data from a cohort of HIV-positive individuals. The researchers compared the incidence of anal cancer between individuals who had received the HPV vaccine and those who had not been vaccinated. By examining the medical records and follow-up data of study participants, they were able to determine the association between HPV vaccination status and the risk of anal cancer development. The findings of the study revealed that HIV-positive individuals who had received the HPV vaccine had a lower risk of developing anal cancer compared to those who had not been vaccinated. This suggests that HPV vaccination may confer a protective effect against anal cancer in this population. The observed reduction in the risk of anal cancer among vaccinated individuals underscores the potential benefits of HPV vaccination as a preventive measure against HPV-related malignancies, including anal cancer, among HIV-positive individuals.

The population-based cohort study conducted by Hessol et al., (2018) aimed to investigate the effectiveness of HPV vaccination in preventing cervical intraepithelial neoplasia (CIN) among HIV-positive women. CIN represents a precancerous condition of the cervix, commonly caused by persistent infection with high-risk HPV types, and it can progress to cervical cancer if left untreated. HIV-positive women are at an increased risk of developing CIN and cervical cancer due to their compromised immune systems. To evaluate the impact of HPV vaccination on CIN risk among HIV-positive women, Hessol et al., (2018) compared the incidence of CIN between HPV-vaccinated and unvaccinated HIV-positive women, as well as between HIV-positive and HIV-negative women. The study utilized data from a population-based cohort of women and analysed medical records to determine HPV vaccination status and the occurrence of CIN over time. The findings of the study demonstrated that HPV vaccination was associated with a reduced risk of CIN among HIV-positive women. Specifically, HIV-positive women who had received the HPV vaccine had a lower incidence of CIN compared to their unvaccinated counterparts. This suggests that HPV vaccination may be effective in preventing the development of CIN among HIV-positive women, thereby reducing their risk of progressing to cervical cancer.

The findings of all these studies reveal that HIV-positive individuals who receive the HPV vaccine had a lower risk of developing cancer compared to those who had not been vaccinated. This suggests that HPV vaccination may confer a protective effect against cervical cancers in this population.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.0 Conclusion

Based on the study objectives, the study findings reveal the prevalence, and several risk Factors associated with HPV infection among HIV-positive women 18 years and above attending the antiretroviral therapy clinic at China-Uganda Friendship Hospital Naguru.

The prevalence of HPV infection among HIV-positive women aged 18 years and above attending the antiretroviral therapy (ART) clinic at China-Uganda Friendship Hospital Naguru was found to be 21.60% indicating a significant public health concern. This finding aligns with previous research conducted in Uganda and other African countries, where the HPV prevalence ranged between 17% and 25%. For instance, Asiimwe et al. (2008) reported a prevalence of high-risk HPV infection in a population-based sample of women in rural Uganda. Similarly, Castle et al., (2020) found high-risk HPV prevalence in self-collected cervicovaginal specimens from women in Botswana, and Sweet et al., (2020) reported HPV prevalence among female sex workers in Kenya. These studies collectively indicate a consistent range of hr-HPV prevalence across different populations in Africa.

Regarding sociodemographic risk factors associated with HPV infection, education level emerged as a significant predictor among HIV-positive women attending the ART clinic. Lower education levels were associated with a heightened risk of HPV infection in this population, highlighting the importance of educational interventions in mitigating HPV risk among HIV-positive individuals.

In terms of sexual behavior-related risk factors, the study identified two significant factors associated with HPV infection among HIV positive women at the ART clinic which were the HPV immunization status and having three or more sexual partners were at increased risk of HPV infection, highlighting the importance of promoting safer sexual practices to reduce HPV transmission.

Overall, these findings emphasize the multifaceted nature of HPV infection risk among HIV positive women and the importance of addressing sociodemographic and sexual behavior-related factors in HPV prevention strategies.

6.1 Recommendation

Based on the findings of the study, there are several recommendations that can be made to reduce the prevalence of HPV among the HIV positive women aged 18years and above and include the following.

National Level:

MOH should play a central role in implementing comprehensive HPV prevention and control strategies tailored to the needs of HIV positive populations. Policymakers should prioritize the inclusion of HPV vaccination in national immunization programs and ensure equitable access to vaccination services for all HIV positive individuals. Additionally, national health authorities should strengthen cervical cancer screening programs, including the provision of regular Pap smears and HPV testing, to facilitate early detection and treatment of HPV-related lesions. Adequate funding and resource allocation are essential to sustain these initiatives and improve the overall health outcomes of HIV positive individuals.

Community Level:

Community-based organizations and grassroots initiatives have a critical role in raising awareness about HPV infection and promoting preventive behaviors among HIV positive individuals. Community outreach programs should focus on educating HIV positive individuals about the importance of HPV vaccination, regular screening, and safer sexual practices to reduce the risk of HPV transmission and cervical cancer. Peer support networks can provide invaluable emotional and practical support to individuals navigating HPV-related health concerns, fostering a sense of solidarity and empowerment within the community.

Individual Level:

At the individual level, HIV positive individuals should prioritize their health by actively engaging in HPV prevention and screening efforts. This includes getting vaccinated against HPV according to national guidelines, attending regular cervical cancer screenings, and practicing safer sexual behaviors, such as consistent condom use and limiting the number of sexual partners. Individuals should also advocate for their rights to access comprehensive healthcare services, including HPV vaccination and screening, and actively participate in decision-making processes related to their health. Taking proactive steps to prevent HPV infection can significantly reduce the risk of HPV-related complications and contribute to overall well-being.

6.2 Limitations of the study

Respondents were not readily available to participate into the study. This was however sorted by using the hospital records to trace them. The issue of consent was important, and some clients were not readily accepted to participate. The study only considered consenting clients.

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UGANDA CHRISTIAN UNIVERSITY
A Centre of Excellence in the Heart of Africa

30th August, 2023

TO WHOM IT MIGHT CONCERN

Dear Sir/Madam,

RE: INTRODUCTORY LETTER FOR HALIIMAH NALUBUWA

Warm greetings from the Directorate of Research and Post-Graduate Studies, UCU!

This serves to introduce the above named; **Haliimah Nalubowa** as our student pursuing a Master's degree of Master of Public Health registration number **RJ21M07/002.**

Abraham is conducting a research as a requirement for the award of the above mentioned degree entitled; ***Risk factors and prevalence of Human Papilloma Virus among HIV positive women attending antiretroviral therapy clinic in China-Uganda Friendship Hospital Naguru***

She has fulfilled all clearance requirements such as getting faculty and Research Ethics Approval from UCUREC; accredited by Uganda National Council for Science and Technology (UNCST). Her work has minimal risks and deemed not harmful to both individual participants and the institution.

Any assistance given to her to achieving this goal will be highly welcome.

Thank you so much.

Yours faithfully,

.....
Dr. Owor Joseph
Head, Post-graduate Studies
Uganda Christian University
jowor.ucu.ac.ug

UGANDA CARES

SITES OF OPERATION

Kampala District
[illegible]
[illegible]
[illegible]

Masaka District
Masaka RRH
Kiyumba HC IV
Kyanamukaaka HC III

Rakai District
Rakai Hospital
Mitukula HC III
Kalisizo Hospital
Kibaale HC IV

Gomba District
Maddu HC IV

Butambala District
Gombe Hospital

Soroti District
Soroti RRH

Gulu District
Gulu Regional Referral Hospital
Awach HC IV

Bukomansimbi District
Butenga HC IV
Bigasa HC III

Lwengo District
Kyazanga HC IV
Lwengo HC IV
Kinoni HC III
Kiwangala HC IV

Amuria District
Amuria Hospital

Kapelebyong District
Kapelebyong HC IV

Kalungu District
Lukaya Healthcare Centre
Kalungu HC III
Bukulula HC IV

Lyantonde District
Lyantonde Hospital

Tororo District
Nagongera HC IV
Mulanda HC IV
Malaba HC III
Mukuju HC IV
Tororo Hospital

Ntungamo District
Rubaare HC IV
Kitwe HC IV

Luwero District
Kasana HC IV
Katikamu HC III
Nyimbwa HC IV

Kalangala District
Mugoye HC III
Bwendero HC III
Bukasa HC IV
Lulamba HC III

Masindi District
Masindi Hospital

Nakaseke District
Nakaseke Hospital

Busia District
Busia HC IV
Masafu Hospital
Lumino HC III

Nakasongola District
Nakasongola HC IV
Kakooge HC III
Lwampanga HC III

May 16, 2024

Our Ref: **AHF/UC/13911**

Ms. NALUBOWA HALIMAH

RJ21MO7/002

Dear Halimah,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT AHF UGANDA CARES.

Reference is made to your request to conduct academic research entitled "**Risk factors and prevalence of human papillomavirus among HIV positive women attending antiretroviral therapy clinic in China Uganda Friendship Hospital Naguru**".

This is to inform you that your protocol and the accompanying REC approval number **UCUREC-2023-551** have been reviewed and permission to conduct the proposed research has been granted.

You are reminded to strictly adhere to the approved research protocol and uphold research ethics in conducting your study. You are required to share your research findings and recommendations with the organization.

We wish you success in your academic endeavors.

Sincerely,

Anthony B. Mutema

Chairperson

Research Committee

AHF

AIDS Healthcare Foundation
Plot 54B Kira Road | P.O. Box 22914 Kampala, Uganda | Tel: +256 200506100 | Website: www.aidshealth.org

Hallimah Nalubowa
Uganda Christian University
+256 785828058
hallima.nalubowa42@gmail.com

30th August, 2023

UG-REC-026 APPROVAL NOTICE

To: Hallimah Nalubowa, Principal Investigator

Re: UCU-REC Application titled: Risk factors and prevalence of human papilloma virus among HIV positive women attending antiretroviral therapy clinic in China-Uganda Friendship Hospital Naguru

Application Number: UCUREC-2023-551

Version: 4.0

Type: [ ] Initial Review
[ ] Protocol Amendment
[ ] Letter of Amendment (LOA)
[ ] Continuing Review
[ ] Material Transfer Agreement
[ ] Other, Specify:

I am please to inform you that the UG-REC-026; UCUREC approved the above referenced application.

Approval of the research is for the period from 30th August, 2023, to 30th August, 2024.

This research is considered minimal risk category.
As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and additions to the protocol or the consent form must be submitted to the REC for re-review and approval prior to the activation of the changes. The REC application number assigned to the research should be cited in any correspondence.
3. Reports of unanticipated problems involving risks to participants or other must be submitted to the REC. New information that becomes available which could change the risk: benefit ratio must be submitted promptly for REC review.

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4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by subjects and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Regulations require review of an approved study not less than once per 12-month period. **Therefore, a continuing review application must be submitted to the REC eight weeks prior to the above expiration date of 30th August, 2024 in order to continue the study beyond the approved period.** Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study, at which point new participants may not be enrolled and currently enrolled participants must be taken off the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. Your research details have been shared with the Executive secretary of Uganda National Council for Science and Technology (UNCST) and you are not required to get clearance since you are a Masters Degree research. Refer to UNCST Research registration and clearance Policy and guidelines (July 2016) in Uganda section 6(e).

The following is the list of all documents approved in this application by UG-REC _026:

	Document Title	Language	Version	Version Date
1.	Protocol	English	1.0	2023-06-14
2.	Data collection tools	English	1.0	2023-06-14
3.	Informed Consent forms	English	1.0	2023-06-14

Signed and Stamped

Prof. Peter Waiswa.
UCUREC Chairperson,
pwaiswa@musph.ac.ug

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Appendix 6: Consent form to participate in the study

Study Title: **risk factors and prevalence of human papilloma virus among HIV positive women attending antiretroviral therapy clinic in China-Uganda Friendship Hospital Naguru**

Introduction:

Hello, my name is **Nalubowa Haliimah.** I am a student of Uganda Christian University, conducting a study within **China-Uganda Friendship Hospital Naguru.** You are being requested to take part in this study.

Purpose of the study: to determine risk factors and prevalence of human papilloma virus among HIV positive women attending antiretroviral therapy clinic in China-Uganda Friendship Hospital Naguru

Your participation in the study: Your decision to participate in this study is voluntary. You may refuse to take part in the study or stop at any time without affecting your relationship and services you get from **China-Uganda Friendship Hospital Naguru.** Once you accept to take part in this study, you will be asked questions regarding **risk factors and prevalence of human papilloma virus among HIV positive women attending antiretroviral therapy clinic in China-Uganda Friendship Hospital Naguru.** Your responses will be entered in a phone tablet so as to make sure we don't lose any piece of information.

What are the risks involved in participating in this study: We do not anticipate any major risk to be caused by participating in this study. However, if for any reason, you feel uncomfortable with some questions asked during the discussion, you are free to discontinue your participation without any repercussions whatsoever.

Your confidentiality: Your name will not be written on this form and therefore you will not be identified in any way. Your responses will be kept with utmost confidentiality.

Benefits of being in this study: There are no direct benefits to you when you participate in this study. Your responses will help us in learning more about **risk factors and prevalence of human papilloma virus among HIV positive women attending antiretroviral therapy clinic in China-Uganda Friendship Hospital Naguru.** We will base on your responses to suggest recommendations to the government to improve immunization completion in this area.

Costs: You will not pay or be paid for participating in this study BUT some refreshments and transport refund for those who will come specifically to attend to this study but with no prior arrangements to be around.

What does your signature mean: Your signature on this document indicates that you have decided to take part in this study, and that you have read and understood the information provided. You will be given a copy of the consent form.

Who to contact: If you have questions about the study, you can contact the Principle Investigator, **Nalubowa Haliimah;** Telephone; 0782449786

Whom to contact in case of ethical related concerns

This study was approved by Uganda Christian University Research. Ethics committee (UCU-REC) and cleared by Uganda national council for science and technology (UNCST). In case of any ethical related concerns or inquiries, you can contact

UCU-REC Chairperson.

Prof .peter Waiswa on 0772 405 357 pwaiswa@musph.ac.ug or UCU-REC secretariat.

Mr. osborn Ahimbisibwe; 0775737627 or oahimbisibwe@ucu.ac.ug

Consent statement: I have read and I understood the provided information and I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

----------	----------	----------
Participant's name	Signature / Thumb print	Date
----------	----------	----------
Name of the witness	Signature	Date
----------	----------	----------
Name of the consenting person	Signature	Date

Appendix 5: Checklist

	Status	Comments
Risk factors		
Several sexual partners		
Prime Age at first intercourse		
Parity		
Oral contraceptives		
Other Sexually Transmitted diseases		
Age		
Dietary factors		
HIV infection		
Other STIs		
Immunosuppressive conditions		
Socioeconomic status		
Use of drugs		
HPV immunization status		
Prevalence of Human Papilloma		
HPV status		
deaths related to HPV		

Appendix 3: QUESTIONNAIRE FOR WOMEN

Dear respondent,

I am Nalubowa Hahumah a student pursuing a Masters of public health leadership in Uganda Christian University. My study is on "***risk factors and prevalence of human papilloma virus among HIV positive women attending ART clinic in china-Uganda friendship hospital***" You have been identified as a respondent, and I kindly request you to spare a few minutes of your busy time to fill this questionnaire. This study is purely for an academic research. Your honest answer and sincere responses are highly appreciated and shall be treated with outmost confidentiality.

SECTION A: PERSONAL DEMOGRAPHICS

1) Age of the respondent (years).....

2) Level of education attained

1) No formal ☐ cation 2) Primary ☐ secondary ☐ Koma

4) Bachelor's degree ☐ 5) master's degree ☐

3) How long have you been in touch with this facility?

a) Less than 1 year ☐ b)1- 5 years ☐) 6- 10 years

d) 11-15 years ☐ e) more than 15 years ☐

SECTION B: QUESTIONS ON STUDY VARIABLES

For the statements below, please rate the extent of your agreement or disagreement with each by ticking one of the options provided. Degrees: 5. strongly Agree, 4. Agree, 3. Not Sure, 2. Disagree, 1. strongly disagree.

	RISK FACTORS	SA	A	NS	D	SD
	Number of sexual partners					
RF1	I have several sexual partners	5	4	3	2	1
RF2	I have ever had several sexual partners	5	4	3	2	1
RF3	In the past one year I have had more than one sexual partner	5	4	3	2	1
	Age at first intercourse					
RF4	I started sex before I was 18.	5	4	3	2	1

RF5	I was sexually active when I was not yet independent	5	4	3	2	1
RF6	I think I started sex prematurely	5	4	3	2	1
	Parity					
RF7	I have more than 3 children	5	4	3	2	1
RF8	I have ever heard an involuntary abortion (s)	5	4	3	2	1
RF9	I hope to carry another pregnancy	5	4	3	2	1
	Oral contraceptives					
RF10	I have ever used an oral contraceptive (the combination pill, the progestin-only pill, and the continuous use pill)	5	4	3	2	1
RF11	I am currently using oral contraceptives.	5	4	3	2	1
RF12	I like using oral contraceptives.	5	4	3	2	1
	Other Sexually Transmitted diseases					
RF13	I have other STIs.	5	4	3	2	1
RF14	I have recently been treated for STIs.	5	4	3	2	1
RF15	I am exposed to factors that may increase my risk of getting STIs.	5	4	3	2	1
	HPV immunization status					
RF16	I am fully immunized for cancer	5	4	3	2	1
RF17	I have been immunized for cancer for some time now.	5	4	3	2	1
RF18	I have been immunized for various types of cancer	5	4	3	2	1
	Age					
R19	I think the older I grow , the higher the chances of contracting HPV	5	4	3	2	1
R20	I commonly see cases of cancer among older women as compared to young women.	5	4	3	2	1
	Dietary factors					
R21	Poor nutrition is a likely cause of cancer	5	4	3	2	1
R22	cancer is common among women who eat poorly.	5	4	3	2	1
	HIV infection and Other STIs					
R23	Presence of other STIs increases the risk of HPV	5	4	3	2	1

R24	It is more common to find HPV among women who have HIV	5	4	3	2	1
	Immunosuppressive conditions	5	4	3	2	1
R25	Women with gaps in their immunity tend to have greater risk of HPV	5	4	3	2	1
R26	It is easier to get HPV when your body lacks some basic nutrients	5	4	3	2	1
	Socioeconomic status	5	4	3	2	1
R25	Poorer women are safer than their richer counterparts when it comes to getting HPV.	5	4	3	2	1
R26	Rich women tend to go early for HPV screening and thus avoid disease progression.	5	4	3	2	1
	Use of drugs (e.g Cigarette smoking)	5	4	3	2	1
R27	More use of alcohol is likely to increase the risk of getting HPV	5	4	3	2	1
R28	Drug addicts tend to have more risks of getting HPV as compared with non-drug addicts.	5	4	3	2	1
	Prevalence of Human Papilloma	**SA**	**A**	**NS**	**D**	**SD**
P1	I tested positive for HPV	5	4	3	2	1
P2	I have ever been so sick due to cancer.	5	4	3	2	1

End, Thank You Very Much

Appendix: 4: EBIBUUZO

Nze Nalubowa Halimah omuyizi asoma diguli ey'okubiri mu [illegible] Uganda Christian University. Okunoonyereza kwange kuli ku '[illegible] human papilloma mu bakyala abalina akawuka ka siriimu abagenda mu ddwaaliro [illegible] siriimu mu ddwaaliro erya China-Uganda". Omulabirwa ng'omuntu ayabuuziddwa, [illegible] okusigaza eddakiika ntono mu budde bwo obw'okukola ennyo okujjuza ekibuuzo kino. Okunoonyereza kuno kwa kunoonyereza kwokka mu by'ensoma. Okuddamu kwo okw'amazima n'okuddamu kwo mu bwesimbu bisuubirwa nnyo era bijja kukwatibwa mu kyama ekisukkiridde

EKITUNDU A: EBIKUKWATAKO NGA OMUNTU

Emyaka gy'oyo ebuuziddwa..................................

Omutendera gw'obuyigirize gwe Watuukako

1)Sasomako yadde 2)Pulayimale 3) Siniya 4) Dipuloma 5) Diguli Esooka 6) Diguli ey'okubiri

Omaze bbanga ki ng'okwatagana n'ekifo kino?

a) Emyaka 5 b) 6 okutuuka ku 10 c) Emyaka 11-15 d) Emyaka egisukka mu 15

EKITUNDU B: EBIBUUZO KU NKYUKAKYUKA Z'OKUSOMA

Ku bigambo ebiri wansi, nsaba ontegeeze obunene bw'okkiriziganya oba obutakkiriziganya kwo na buli omu nga ossaako akabonero ku emu ku ngeri eziweereddwa.

	[illegible]	SA	A	NS	D	SD
	Omuwendo gwebewegatta nabo					
RF1	Nnina abaami benegata nabo abasukka mu omu.	5	4	3	2	1
RF2	Nze nfunyeeko ababeezi abawerako	5	4	3	2	1
RF3	Mu mwaka gumu oguwedde mbadde n'ababeezi abasukka mu omu	5	4	3	2	1
	Emyaka ng'osooka okwegatta					
RF4	Natandika okwegatta nga sinnaweza myaka 18.	5	4	3	2	1

[illegible]	[illegible]					
[illegible]	[illegible]	5	4	3	2	1
	[illegible] omukyala gw'abadde afunye olubuto	5	4	3	2	1
[illegible]	[illegible]					
[illegible]	[illegible]	5	4	3	2	1
[illegible]	[illegible]	5	4	3	2	1
	Eddagala ly'okuziyiza okuzaala eriweebwa mu kamwa	5	4	3	2	1
[illegible]	Nkozesezza eddagala eriziyiza okuzaala ery'omu kamwa (empeke ey'omugatte, empeke erimu progestin yokka, n'empeke ey'okukozesa [illegible])	5	4	3	2	1
[illegible]	Mu kaseera kino nkozesa eddagala eriziyiza okuzaala ery'omu kamwa	5	4	3	2	1
[illegible]	Njagala nnyo okukozesa eddagala eriziyiza okuzaala ery'omu kamwa	5	4	3	2	1
	Endwadde endala ezisingibwa mu kwegatta					
RF13	Nnina endwadde endala ez'ekikaba.	5	4	3	2	1
RF14	Gye buvuddeko nnajjanjabwa endwadde z'ekikaba.	5	4	3	2	1
RF15	Nfuna ensonga eziyinza okwongera ku bulabe bwange obw'okufuna endwadde z'ekikaba.	5	4	3	2	1
	Embeera y'okugema HPV					
RF16	Ngemeddwa mu bujjuvu obulwadde bwa HPV.	5	4	3	2	1
RF17	Nze mmaze ebbanga nga ngemebwa obulwadde bwa HPV.	5	4	3	2	1
RF18	Ngemeddwa ebika bya HPV eby'enjawulo.	5	4	3	2	1
	Emyaaka					
R19	Ndowooza gye nkoma okukula , emikisa gy'okukwatibwa kansa gye gikoma okubeera waggulu	5	4	3	2	1
R20	Nze bulijjo ndaba kansa mu bakyala abakadde bw'ogeraageranya n'abakyala abato.	5	4	3	2	1
	Ensonga z'emmere					
R21	Endya embi y'eyinza okuvaako kansa	5	4	3	2	1

R22	Kansa etera mu bakyala abalya obubi.	5	4	3	2	1
	Obulwadde bwa siriimu n'endwadde endala ez'ekikab					
R23	Okubeerawo kw'endwadde endala ez'ekikaba kyongera ku bulabe bwa kansa	5	4	3	2	1
R24	kyangu okusanga kansa mu bakyala abalina akawuka ka siriimu.	5	4	3	2	1
	Embeera eziziyiza obusimu obuziyiza endwadde					
R25	Abakyala abalina ebituli busobozi bwokuziyiza endwadde batera okuba n'obulabe obw'amaanyi obw'okulwala HPV.	5	4	3	2	1
R26	Kyangu okufuna kansa ng'omubiri gwo tegulina biriisa bikulu.	5	4	3	2	1
	Embeera y'eby'enfuna n'embeera z'abantu					
R25	Abakyala abaavu balina obukuumi okusinga bannaabwe abagagga bwe kituuka ku kufuna kansa	5	4	3	2	1
R26	Abakyala abagagga batera okugenda nga bukyali okwekebejjebwa kansa era bwe batyo ne beewala okuba nobulwadde.	5	4	3	2	1
	Okukozesa ebiragalalagala (e.g okunywa sigala) .	5	4	3	2	1
R27	Okunywa emyo omwenge kyolekedde okwongera ku bulabe bw'okufuna kansa					
	Obungi bw'obulwadde bwa kansa wabakyala	SA	A	NS	D	SD
P1	Nakeberebwa nga nnina kansa wabakyala	5	4	3	2	1
P2	Nze mbadde mulwadde nnyo olw'obulwadde bwa kookolo	5	4	3	2	1

Appendix 7: okukkiriza okwetaba mu kunoonyereza kuno

Omulwamwa Gwo'kunoonyereza: Ebiyinza okuvaako obulabe n'obungi bw'akawuka ka kokolo mu bakyala abalina akawuka ka siriimu abagenda mu ddwaaliro ly'eddagala eriweweeza ku kawuka ka siriimu mu China-Uganda Friendship Hospital Naguru

Okwanjula:

Mwasuze mutya, amannya gange nze Nalubowa Haliimah, ndi muyizi wa Uganda Christian University, nga nkola okunoonyereza munda mu ddwaaliro lya China-Uganda Friendship Hospital Naguru. Osabibwa okwetaba mu kunoonyereza kuno.

Ekigendererwa ky'okunoonyereza kuno: okuzuula ensonga eziyinza okuvaako akabi n'obungi bw'akawuka ka human papilloma mu bakyala abalina akawuka ka siriimu abagenda mu ddwaaliro ly'eddagala eriweweeza ku siriimu mu ddwaaliro lya China-Uganda Friendship Hospital Naguru

Okwetaba kwo mu kusoma: Okusalawo kwo okwetaba mu kunoonyereza kuno kuba kwa kyeyagaliro. Oyinza okugaana okwetaba mu kunoonyereza oba okuyimirira essaawa yonna nga tekikosezza mukwano gwo n'obuweereza bw'ofuna okuva mu ddwaaliro lya China-Uganda Friendship Hospital Naguru. Bw'omala okukkiriza okwetaba mu kunoonyereza kuno, ojja kubuuzibwa ebibuuzo ebikwata ku nsonga eziyinza okuleeta akabi n'obungi bw'akawuka ka kokolo mu bakyala abalina akawuka ka siriimu abagenda mu ddwaaliro ly'eddagala eriziyiza akawuka ka siriimu mu ddwaaliro lya China-Uganda Friendship Hospital Naguru. Eby'okuddamu byo bijja kuyingizibwa mu tabuleti y'essimu tusobole okukakasa nti tetufiirwa mawulire gonna.

Bulabe ki obuli mu kwetaba mu kunoonyereza kuno: Tetusuubira kabi konna kanene akayinza okuva mu kwetaba mu kunoonyereza kuno. Naye singa olw'ensonga yonna, owulira nga tolina mirembe na bibuuzo ebimu ebibuuziddwa mu kiseera ky'okukubaganya ebirowoozo, oli wa ddembe okuyimiriza okwetaba kwo awatali kuddirira kwonna.

Ebyama byo: Erinnya lyo terijja kuwandiikibwa ku foomu eno n'olwekyo tojja kumanyibwa mu ngeri yonna. Eby'okuddamu byo bijja kukuumibwa nga bya kyama nnyo.

Emigaso gy'okubeera mu kunoonyereza kuno: Tewali migaso gya butereevu gy'oli ng'ogenda okwetaba mu kunoonyereza kuno. Eby'okuddamu byammwe bijja kutuyamba mu kuyiga ebisingawo ku nsonga eziyinza okuleeta akabi n'obungi bw'akawuka ka human papilloma mu bakyala abalina akawuka ka siriimu abagenda mu ddwaaliro ly'obujjanjabi obulwanyisa akawuka mu China-Uganda Friendship Hospital Naguru. Tujja kwesigamiziddwa ku by'oddamu okuteesa ku biteeso eri gavumenti okulongoosa mu kumaliriza okugema mu kitundu kino.

Ensimbi: Teija kusasula oba okusasulwa olw'okwetaba mu kunoonyereza kuno naye ebimu ku bikozesereza n'entambula ebiddizibwa abo abagenda okujja mu ngeri ey'enjawulo okukola ku kunoonyereza kuno naye nga tewali nteekateeka ya kusooka kubeerawo

Omukono gwo gutegeeza ki : omukono gwo ku kiwandiiko kuno gulaga nti osazeewo okwetaba mu kunoonyereza kuno, era nti osomye era otegedde amawulire agaweereddwa Olja kuweebwa kkopi ya fooma y'okukkiriza

Ani gw'olina okutuukirira: Bw'oba olina ebibuuzo ebikwata ku kunoonyereza kuno osobola okutuukirira omunoonyereza omukulu, Nalubowa Haliimah, Essimu, 0782449786

Ani gw'olina okutuukirira mu mbeera y'ebirumu ebikwatagana n'empisa

Okunoonyereza kuno kwakkirizibwa Uganda Christian University nakakiiko akakwasisa empisa (UCU-REC) era ne kukirizibwa Uganda National Council for Science and Technology (UNCST) Mu mbeera y'okufaayo oba okubuuza kwonna okukwatagana n'empisa, osobola okutuukirira

UCU-REC Ssentebe Prof .Peter Waiswa ku 0772 405 357; pwaiswa@ramosph.ac.ug oba UCU-REC ssaabawandiisi, Mr. Osborn Ahimbisibwe ku 0775737627 oba oahimbisibwe@ucu.ac.ug

Consent statement: Nsomye era nategeera amawulire agaweereddwa era ntegedde nti okwetaba kwange kwa kyeyagalire era nti ndi wa ddembe okuggyayo ekiseera kyonna, nga siwadde nsonga era nga tewali ssente. Ntegedde nti nja kuweebwa kkopi ya fooma eno ey'okukkiriza. Nzikiriziganya kyeyagalire okwetaba mu kunoonyereza kuno.

Omukono gwo (siginikya)	oba	ekinkumu siginikya enaku zomwezi
Erinya ly'akubuuziza siginikya		enakuzomwezi

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TOPIC: RISK FACTORS AND PREVALENCE OF HUMAN PAPILLOMA VIRUS AMONG HIV POSITIVE WOMEN IN CHINA-UGANDA FRIENDSHIP HOSPITAL

PATIENT BIO DATA	Yes	No
Age (between-25 -49 years)		
Last visit in 6 months or less		
RISK FACTORS		
Several sexual partners		
Parity less than 3		
Use of contraceptives		
Sexually Transmitted diseases		
PREVALENCE OF HUMAN PAPILLOMA		
HIV Status (positive)		
HPV status (positive)		
Patient still alive		
If alive ,on HPV treatment		
If alive, on ART treatment		

OMULAMWA: ENNONGA Y'OBULABI N'OBUSANNYALAZO BW'OBUVUNANYIZIBWA OMW'OBULAMU BWA PAPILLOMA VIRUS MU BAKYALA ABALINA AKAWUKA KA SIRIIMU MU DDWALIRO LYA CHINA UGANDA FRIENDSHIP

EBIKWATA KO	Yes	No
Emyaka (wakati 25 -49 emyaka)		
Okukyala okuvumbayo mu myezi 6 oba wansi		
ENNONGA Y'OBULABI		
Abalwezi abawerako		
Embuto yaisi wansi wa 3		
Okukoresa eddagala eriziyiza okuzaala		
Endwadde ezisigibwa mu kwegatta		
OBUNJI BWA KANSA WABAKYALA		
Embeera ya siriimu (alina)		
Embeera ya kansa (alina)		
Omulwadde akyali mulamu		
Bwaba mulamu ,ku bujjanjabi bwa kansa		
Bw'oba mulamu, ku bujjanjabi bwa siriimu		

OMULAMWA: ENNONGA EZ'OBULABI N'OBUSANNYALAZO BW'OBUVUNANYIZIBWA OMW'OBULAMU BWA PAPILLOMA VIRUS MU BAKYALA ABALINA AKAWUKA KA SIRIIMU MU DDWALIRO LYA CHINA UGANDA FRIENDSHIP

EBIKWATA KO	Yes	No
Emyaka (wakati 25 -49 emyaka)		
Okukyala okuvvumbayo mu myezi 6 oba wansi		
ENNONGA EZ'OBULABI		
Ababeezi abawerako		
Embuto eziri wansi wa 3		
Okukoresa eddagala ezizivvira okuzaala		
Endwadde ezisigibwa mu kwegatta		
OBUNJI BWA KANSA WABAKYALA		
Embeera ya siriimu (alina)		
Embeera ya kansa (alina)		
Omulwadde akyali mulamu		
Bwaba mulamu ,ku bujjanjabi bwa kansa		
Bw'oba mulamu, ku bujjanjabi bwa siriimu		

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SCHOOL OF RESEARCH & POSTGRADUATE STUDIES

DISSERTATION CORRECTION COMPLIANCE REPORT BY THE CANDIDATE (POST VIVA FORM)

Date: ……10/4/2025…….

Name of Candidate: ……NALUBOWA HALIIMAH… **Reg. RJ21M07/002 No.**

Title of Dissertation ……RISK FACTORS AND PREVELANCE OF HUMAN PAPILLOMA VIRUS AMONG HIV POSITIVE WOMEN ATTENDING ANTIRETRO VIRAL THERAPY CLINIC AT CHINA UGANDA FRIENDSHIP HOSPITAL NAGURU…

SN	COMMENTS BY EXTERNAL EXAMINER	ACTION TAKEN	INDICATOR
1	To correct the typos and grammatical errors throughout the dissertation.	All typos and grammatical errors have been corrected in the dissertation.	Corrected dissertation submitted with no errors.
2	The 2nd and 3rd objectives should be merged to get one objective: “	The second and third objectives were merged as recommended, creating a new objective that includes both.	2nd and 3rd objectives merged together.
3	To include details in describing the study site such as catchment area, bed capacity, and services offered, who runs the ARV clinic, which days of the week it is open, whether the HPV testing is	Detailed description of the study site has been added, including the catchment area, bed capacity, services offered, ARV clinic operation details, HPV testing practices, and	Comprehensive description of study site added.

	routinely done in the clinic, and what is done to the women who test positive for HPV.	management of HPV-positive women.	
4	To describe the study procedure clearly so that we understand the relationship between file retrieval and identification of study participants.	The study procedure has been revised to clearly describe how participants were identified, approached, and enrolled, and the roles of those who assisted in the process.	Clear description of study procedure and participant recruitment process provided.
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SN	**COMMENTS BY INTERNAL EXAMINER**	**ACTION TAKEN**	**INDICATOR**
1	To update the literature in the background information because some of her literature is dated more than 10-20 years ago.	Updated and recent literature has been included to replace older references and ensure the background information is current.	Updated literature incorporated into the background section.
2	The literature review section did not extensively capture the variables in the conceptual framework	The literature review has been expanded to better address the variables in the conceptual framework	Expanded literature review with better alignment to the conceptual framework.
3	To show who administered the questionnaire and how it was done.	The details on who administered the questionnaire, including their role and the method used for administration, have been added.	Clear explanation of questionnaire administration process added
4	Details on how data is stored, who has access, and the data retention policy are missing.	A section has been added describing how data will be stored, who will have access, and the data retention policy to strengthen the ethical aspects.	Ethical considerations regarding data storage, access, and retention included.
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SN	COMMENTS BY VIVA VOCE PANNEL	ACTION TAKEN	INDICATOR
1	To add objective 2 and 3 to become determinants.	Objectives 2 and 3 have been merged into a single objective, now focused on the determinants of HPV infection among HIV-positive women attending the ARV clinic.	Objective 2 and 3 merged into one, reflecting the determinant focus.
2	Clarify on study procedures in the thesis.	The study procedures have been clarified in the thesis, detailing participant identification, recruitment, and the study's overall methodological approach.	Study procedures clearly described and clarified.
3	Align the recommendations to the results in the study.	Recommendations have been revised to directly correspond to the results and findings of the study, ensuring relevance and alignment.	Recommendations aligned with study results
4	Clarify the recruitment of respondents.	A more detailed explanation of how respondents were recruited, including inclusion criteria, recruitment methods, and ethical considerations, has been added.	Clear description of recruitment process added.
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NALUBOWA HALIIMAH……DR. EDWARD MUKOOZA KIBIKYO  23/05/25

Candidate's Name Signature Supervisor's Name Signature