UTILIZATION OF CERVICAL CANCER SCREENING SERVICES AMONG WOMEN LIVING WITH HIV/AIDS IN MACHAKOS COUNTY, KENYA

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university

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DEDICATION

I dedicate this thesis to my parents, family, and friends who have been there for me and supported me over the years.

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ABBREVIATION AND ACRONYM

ACCP	Alliance of Cervical Cancer Prevention
AIDS	Acquired Immuno- Deficiency Syndrome
AIHW	Australian Institute of Health and Welfare
ART	Antiretroviral Therapy
ASIR	Age-standardized incidence rates
ASMR	Age-standardized mortality rates
ASR	Age-standardized rate
CC	Cervical cancer
CCC	Comprehensive Care Clinic
CCES	Cervical Cancer Elimination Strategy
CCS	Cervical Cancer Screening
CDC	Center for Disease Control and Prevention
CIN	Cervical Intraepithelial Neoplasm
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
ICC	Invasive Cervical Cancer
KDHS	Kenya Demographic Health Survey
KEMRI	Kenya Medical and Research Institute
MoH	Ministry of Health

MoHNCPS	Ministry of Health National Cervical Cancer Prevention Strategic Plan
NCCS	National Cancer Control Strategy
NCSG	National Cancer Screening Guidelines
NHIF	National Hospital Insurance Fund
OCP	Oral contraceptive pill
PAP SMEAR	Papanicolaou Smear
PPP	Public-Private Partnership
RH	Reproductive Health
SCJ	Squamous columnar junction
SIL	Squamous intraepithelial lesions
SOP	Standard Operating Procedure
TZ	Transformation Zone
VIA	Visual Inspection with the use of Acetic Acid
VILI	Visual Inspection by the use of Lugol's Iodine
WHO	World Health Organization
WLWHIV	Women Living With HIV/AIDS

DEFINITION OF OPERATIONAL TERMS

Adherence	The act of doing something according to a particular rule, standard, agreement. In this case adherence to the standards of cervical cancer screening means going for screening services every 1 year
Awareness	Awareness involves women knowing or having heard about cervical cancer including the screening methods.
Cervical cancer testing	Is the early identification of pre-malignant growths and sores by use of either Pap test, VIA/VILLI or HPV test.
Knowledge of cervical cancer	Understanding cervical cancer, causal agent, transmission, controls (Screening, Prevention, treatment and palliative care) among others.
Practices	They are observable actions of individuals in response to a stimulus, referring to HIV positive females of reproductive age (25-49) years concerning their utilization of cervical cancer screening services (VIA/VILI, Pap smear, HPV testing).
Utilization	It is an act of women taking up cervical cancer screening services (VIA/VILI, Pap smear, HPV testing) in the past 2 years. Women were considered to adhere to cervical cancer screening if they had utilized the screening services and not adhered if they did not utilize the screening services. This information was obtained by administering a questionnaire.
Partner	Husband or the person the respondent (woman) has sexual relations with.
Screening	This is the act of identifying and detect potential health condition or risk when the symptoms are not yet visible.

ABSTRACT

Cervical cancer (CC) represents a significant health challenge globally, particularly in low- and middle-income countries (LMIC), where it ranks third in incidence and mortality. In Kenya, CC constitutes 20% of female cancer cases and accounts for 15% of cancer-related deaths annually. Women living with HIV/AIDS (WLWHIV) face a higher risk of developing cervical cancer, which adversely impacts their quality of life. Consequently, early screening for cervical cancer among WLWHIV is crucial for timely diagnosis and treatment. This study aimed to evaluate the utilization of cervical cancer screening services among WLWHIV in Machakos County, Kenya. It focused on several specific objectives: identifying socio-demographic factors, assessing knowledge and attitudes toward screening, and analyzing health system factors that influence screening utilization. The study involved 422 HIV-positive women aged 18 to 49 years attending the Comprehensive Care Clinic (CCC) at Machakos County hospitals. Researchers employed a systematic random sampling method, and data were analyzed using the R statistical program, particularly logistic regression to explore variable relationships. Out of 422 participants, 410 women (97%) completed the questionnaire, with an average age of 31.7 years. Screening uptake was notable, with 249 women (61%) having been screened for cervical cancer according to Ministry of Health (MOH) guidelines, while 161 women (39%) had not. Bivariate analysis revealed that age (OR=2.758, P=<0.001) and religion (OR=5.953, P=0.050) were socio-demographic factors linked to screening utilization. Additionally, knowledge and attitudes played a crucial role; women with adequate knowledge of cervical cancer screening had a significantly higher odds ratio (OR=10.210, P=<0.001), as did those who believed in the importance of early screening, even in the absence of symptoms (OR=19.317, P=<0.001). Health system factors also emerged as significant. For instance, WLWHIV motivated by health workers showed a higher likelihood of utilizing screening services (OR=19.317, P=<0.01), as did those who received health education about cervical cancer screening (OR=1.636, P=<0.039). In multivariable analysis, two factors retained a significant association with screening: having adequate knowledge about cervical cancer and its risks, along with the availability of screening services (AOR=3.67, P=<0.001), and the belief in the necessity of screening regardless of symptom presence (AOR=5.460, P=<0.001).In conclusion, the findings highlight that a notable 39% of WLWHIV in Machakos County are not compliant with MOH guidelines for cervical cancer screening. Key factors influencing screening utilization include adequate knowledge of the disease, perceived risks, and belief in the need for screening. To enhance screening rates among WLWHIV, it is essential for the Ministry of Health in Machakos County to implement targeted strategies that promote awareness and education about cervical cancer. Strengthening public health programs focused on WLWHIV can significantly improve knowledge and encourage adherence to recommended screening practices, thereby enhancing early detection and treatment outcomes.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Cervical malignancy is characterized by the overgrowth of typical cells in the cervical region with the potential to attack other body parts. The most common causative organism is HPV, especially HPV 16 and HPV 18 strains. (Abiodun *et. al,* 2018). Globally the mortality and incidences of cervical cancer were estimated to be 311,000 and 570,000 respectively (Teka *et al*., 2021). In Africa about 81,687 deaths and 119,284 cases of cervical cancer occur among women annually, thus the second leading cause of cancer (*AFRICA R. Human papillomavirus and related diseases report AFRICA.*, 2021). Cervical cancer is the most common cancer in Eastern Africa among women with mortality rates of 40.1 and age-standardized incidence of 30.0 per 100,000. Cervical cancer in Kenya contributes to 5,250 (12.9%) annual cancer cases and annual cause of 3,286 (11.84%) cancer deaths making it the second most cause of cancer-related deaths among women (MOH, 2018).

In Sub-Saharan Africa, 60% of all adults living with HIV/AIDS are women (Redfield *et al*., 2019). WLWHIV have a high risk for the development of cervical cancer (Taghavi *et al.*, 2022). In retaliation to this increased susceptibility among WLWHIV, there is a need to integrate cervical cancer screening services as an important component in treatment and care for women living with HIV/AIDS (New-Aaron *et al*., 2020). Women who have untreated HIV infection have compromised immunity therefore, advancement to premalignant sores can take about 5 - 10 years (Haque *et. al,* 2018). This is because women with HIV infection are immuno-suppressed and are likely to be co-infected with other HPV viruses. There is a high probability of this category of women engaging in

risky sexual behavior, tobacco use; early sex debut that involves unprotected sex with multiple partners. These are isolated as risks for contracting HPV among women with HIV (Haque *et. al*, 2018).

Cervical cancer has a significant burden for morbidity and mortality for women, families and community particularly in marginalized, hard to reach communities (WHO, 2021). Therefore, emphasizes have to be placed for the prevention including screening and vaccination to support the realization of the 2030 Agenda for Sustainable Development "Goal1 (End poverty in all its forms everywhere)", "Goal 3 (Ensure healthy lives and promote well-being for all at all ages)", "Goal 5 (Achieve gender equality and empower all women and girls)" and "Goal 10 (Reduce inequality within and among countries)" (WHO, 2021). Given the need for cervical cancer screening, it is important to understand all the key factors in utilization of cervical cancer screening among WLWHIV. This research study soughed to explore utilization of cervical cancer screening and associated factors among women living with HIV/AIDS in Machakos County, Kenya.

1.2 Problem Statement

WLWHIV have higher chances of developing cervical cancer due to their compromised immunity (Kimondo *et al*., 2021). Cervical cancer has a negative effect on the quality of life among women living with HIV which becomes a life-threatening disease burden (Lukorito *et al*., 2017). Although cervical cancer screening can greatly reduce the disease burden, its use is limited in lower- and middle-income countries. In Kenya, only 3.2% of the women (HIV positive and negative), 18-69 years reported having undergone screening for cervical cancer yearly, in comparison to 70% of women in

developed countries (National Cancer Screening Guidelines, 2018). In Ethiopia, less than 25% of the eligible women have undergone cervical cancer screening. A report from Malawi and Zambia shows 19% as well as 27% respectively in females who are HIV infected ages 30–49, who have received screening services and 14% in Kenya. Studies on how services for cervical malignancy examination are utilized amongst women are on the increase. However, less attention has been given to how it is utilized amongst females infected with HIV who are known of having elevated risks of developing cancer of the cervix. The goal of this research was to determine utilization of the cervical cancer screening among women living with HIV at Machakos County.

1.3 Justification

Screening for malignancy of the cervix exists as a cost-effective means to prevent cervical malignancy yet screening is not emphasized in HIV care. Emerging research suggest that gynecologic health care which includes screening for cervical cancer is underutilized by women with HIV in the study area and Kenya at large. The study area provided a good study population since it is the largest facility in the county dealing with HIV positive patients. The clinics are situated within Machakos County that was selected among four counties to pilot universal health care services that are free for county residents and half price for clients from neighboring counties with an aim of improving health seeking behavior of residents. This study was to inform practice through determining utilization, establishing the influence of knowledge on utilization and analyzing factors that are associated with utilization of services for cervical cancer screening among women with HIV and to possibly draw lessons on improving how these women will utilize these services.

1.4 Research Questions

i. Which socio-demographic factors are associated with utilization of services that screen for cancer of the cervix amongst women living with HIV within Machakos County?

ii. Is there any association between cervical cancer screening knowledge and utilization of the services among women living with HIV in Machakos county?

iii. Is there any association between attitude towards cervical cancer screening and utilization of the screening services amongst women who live with HIV within Machakos County?

iv. What health system factors are associated with utilizing services that screen for cervical cancer amongst women who live with HIV in Machakos County?

1.5 Objectives

1.5.1 Broad Objective

To establish the utilization of cervical cancer screening among the women of reproductive age 18-49 years living with HIV at Machakos County Hospital**.**

1.5.2 Specific Objective

i. To identify socio-demographic factors that are associated with utilization of services for cervical cancer screening among women living with HIV in Machakos County.

ii. To establish whether the level of cervical cancer knowledge is associated with the utilization of screening services among women living with HIV in Machakos County.

iii. To establish whether attitude of cervical cancer is associated with utilization of cervical cancer screening services among women living with HIV in Machakos County.

iv. To establish some of the health system factors associated with utilization of services that screen for cervical cancer among women living with HIV in Machakos County.

1.6 Delimitation and limitation

1.6.1 Delimitation

Study population consist of women of reproductive age living with HIV and eligible for screening following the national guidelines (from age 25-49 years) in Machakos County, who consented to the study and met the inclusion criteria. The study was carried out at the comprehensive care clinic situated within the County hospital within a duration of 3 months.

1.6.2 Limitation

Some information might be considered confidential and thus affect the participants' ability to respond honestly. The researcher, however, made efforts to assure respondents of utmost confidentiality. The study was carried out only in the 3 CCC located in 3 sub counties of Machakos county; therefore, the study findings may not be generalizable to

HIV negative women but shows trends in the knowledge, attitude, and health system factors among majority of people living in Machakos county.

1.7 Significance of the study

Findings from this study provide a basis for setting strategies that prioritize testing for cervical malignancy and treatment for ladies afflicted by HIV hence have early detection and treatment of lesions. Eventually, this reduces cervical cancer mortality and morbidity especially among women with HIV to fulfill the WHO and MOH goal. Also, it helps to identify cervical cancer screening awareness, information practices and any factors that may act as hindrances that may affect utilization of services that screen for cervical cancer. This assists with creating focused informative campaigns to give relevant knowledge, consequently advancing social alterations and sparing lives from the scourge of cervical malignancy. This information also can be used by various cervical cancer screening and immunization programs as well as relevant stakeholders (HPV vaccinators, donors, managers and screening coordinators) to develop policies and standards operating procedures, to redesign guidelines on the ways to build screening for cervical disease amongst ladies with HIV. The findings also add to the body of existing knowledge on strategies to be applied to curb cervical cancer in Kenya.

1.8 Conceptual framework

The dependent variable was screening for cervical cancer, and this was measured by asking women if they have adhered to the up-to-date screening of CC as having received screening within the past 12 months or have never adhered to screening for CC. Independent variables were knowledge, attitude and health system factors.

Knowledge was measured by asking participants if they knew about cervical cancer and the signs, causes prevention and risk factors using a 5-item questions for each. Each of these were awarded one point if correctly answered and zero if not answered correctly. Finally, the scores were then categorized into good knowledge if they score above 50% and poor if they scored 49% and below. Attitude on the other hand was measured by asking a series of questions concerning their feelings and thoughts towards cervical cancer screening. The mean scores of these responses were then arranged into either negative or positive attitude. The health system factors concentrated on the information form the healthcare providers, privacy, cost, availability of cervical cancer screening reagents and staff, duration of getting the results and number of hospital visits.

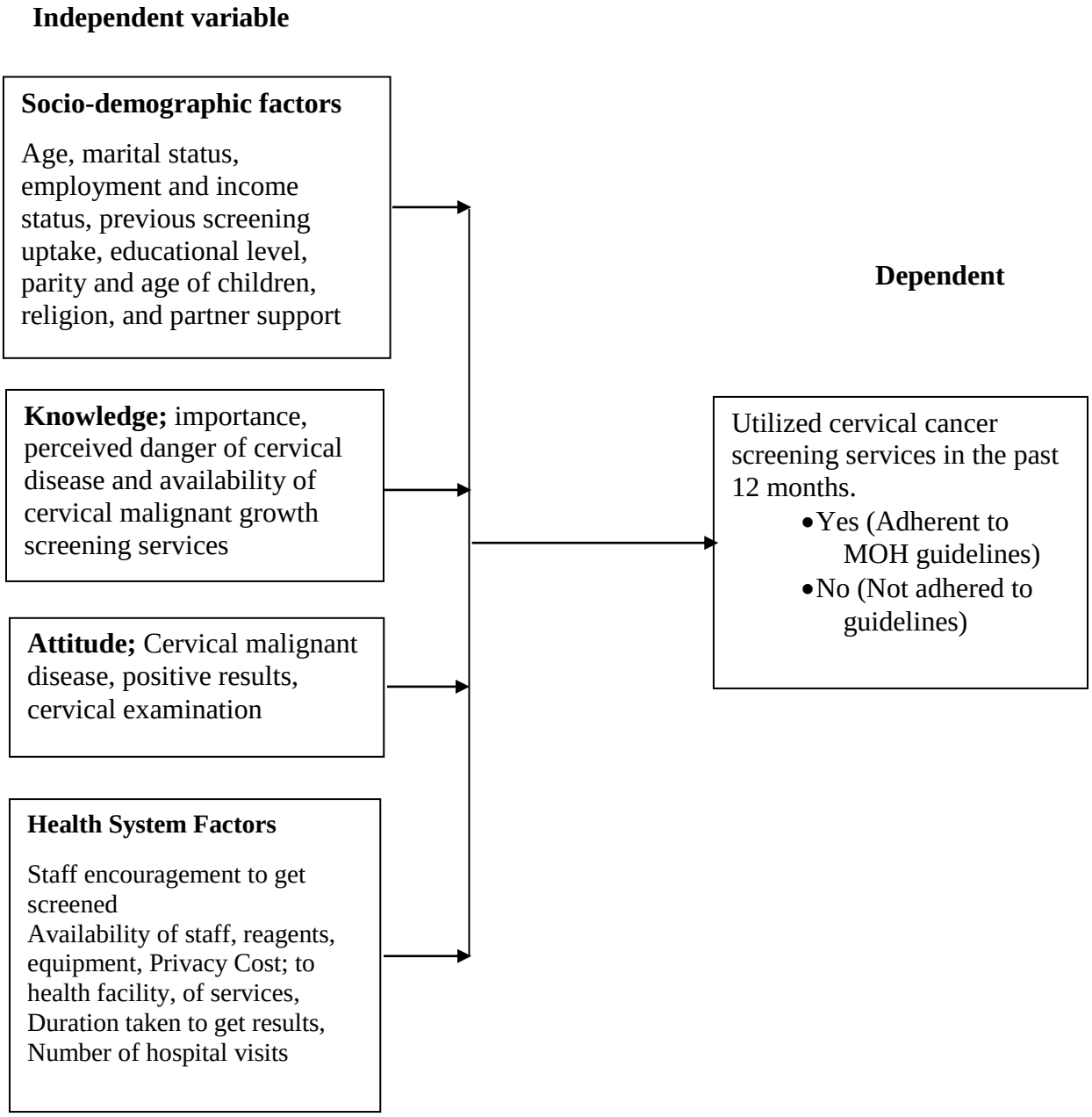

Figure 1.1: Conceptual Framework developed from literature review.

Source: Researcher (**2022)**

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter contains literature reviewed in accordance with research objectives and the study problem. It was based on studies that have been conducted on utilization of services for cervical cancer screening among women with HIV and associated factors. It covers the following areas: The impact of cervical cancer, cancer an emerging tragedy in underdeveloped nations, influence made by traditional medicine in controlling malignancy of the cervix, function of key partners and community associations, laws as well as policies and guidelines for screening in Kenya. The chapter examined the elements related with screening for malignancy of the cervix in this research, that incorporated socio-demographic factors, knowledge of cervical cancer, attitude and health system factors.

2.2 Global, Regional and local burden of cervical cancer

Globally, in 2020 nearly 341831 deaths and 604127 new cases of cervical cancer occurred (Singh *et al*., 2020; Sung *et al*., 2021). This makes cervical cancer the fourth most common cancer among women worldwide even though it is one of the most treatable and preventable malignant disease among women (Stelzle *et al*., 2021). Incidence rate of cervical cancer varies between region with Eastern Africa recording the highest incidence of cervical cancer among women of 54560 new cases (40 cases per 100000) followed by Middle Africa at 15646 new cases. Malawi in Africa recorded the highest incidence of cervical cancer (Stelzle *et al*., 2021). In Kenya the incidence rate of cervical cancer is at 13.1% per 100000 with a mortality rate of 6.9%

per1000000(MOH, 2018). Cervical cancer is the second leading cause of death caused by cancer attributing to 10% (3,266 deaths) (MOH, 2018; Sung *et al*., 2021).

2.3 Global, Regional and local burden of HIV on cervical cancer

Worldwide among women living with HIV/AIDS, an estimated 33,000 cervical cancer cases occur annually consistent to 5.8% of 569847 cases of cervical cancer(Ibrahim Khalil *et al*., 2022; Stelzle *et al*., 2021). Globally, HIV was attributed to all 4.9% (28000) cases of cervical cancer in 2018, ranging from 20% in Africa region 24,000 cases to 1% (490) cases in the Western Pacific region thus making Africa region alone contributing to 85% of all cases of cervical cancer attributed to HIV. Consequently most women living with HIV/AIDS with cervical cancer are from South Africa (8220 cases), Kenya (2750 cases), Tanzania (2610 cases), Mozambique (2150 cases and Uganda (2050 cases), (Stelzle *et al.*, 2021).

2.4 Human immunodeficiency virus and cervical cancer

Women living with HIV/AIDS are at a greater risk of developing cervical cancer due to the Human Papilloma Virus and HIV infections are both sexually transmitted diseases that compromise the state of immunity of these women that increase their susceptibility to HPV infections that results to cervical cancer. HIV disease is now recognized to weaken the previously compromised immunity responsible for recognizing HPV infection. This favors HPV causing more damage than it would in immune competent women. HIV infected women risk getting cancer of the cervix in comparison to those who are HIV negative. Even with the use of HAART, this increased prevalence has remained essentially unchanged. HAART prolongs life span of many HIV infected

women. Also, HPV may be an important co-factor in contracting HIV among females (Bagala *et al*., 2022).

2.5 Technologies adopted for cervical cancer screening

Several technologies have been developed to screen for cervical cancer by applying simple procedures and test in order to identify unrecognized cervical cancer among women before they progress any signs and symptom of cervical cancer. The main aim of screening usually is to identify asymptomatic women who have developed the abnormalities over time that indicate that they could be already having a pre-cancerous condition and then connect them with the necessary diagnostic treatment or care (MOH, 2018).

Treating and screening technologies such as Loop Electrosurgical Extension Procedure (LEEP) or/and cryotherapy followed by Visual Inspection with Acetic acid (VIA) and Visual Inspection by the use of Lugol's Iodine have been adopted successfully in low and middle income countries to give treatment and screening services during regular antiretroviral therapy or during primary care visits (Kemper *et al.*, 2022).

Ultimately, screening leads to well-being and it improves women's standard of life. For HIV positive women to avoid this killer disease, they need to screen for cervical cancer lesions frequently. Women should seek services for screening when precancerous, to arrest progress to cancer. This leads to a promising outcome because cancer of the cervix at this stage is treatable (Elisa, 2018). The Kenya government in coordination with the reproductive health division incorporated screening services to regular care of HIV positive women, in all HIV care centers including teaching those working in all

health sectors about providing screening services through a strategy known as `see and treat`(MOH, 2018)

2.5 Factors that influence utilization of cervical cancer screening services

2.5.1 Associations between women's socio-demographic characteristics and utilization of cervical cancer screening services

Individual characteristics that hinder screening for cervical cancer among WLWHIV include age, marital status, level of education, level of income, residence, religion, parity and occupation (Kaleab *et al*., 2021; Mwantake *et al*., 2022). In most of the studies conducted in Kenya and Tanzania the majority of WLHIV who go for CC screening are within the median age of 35-50 years. This shows that women at this age range are more aware of their health therefore affecting their willingness to go for CC Screening (Kimondo *et al*., 2021; Lukorito *et al*., 2017; Mwantake *et al*., 2022).

A study done in USA amongst females with HIV, at highest danger for cervical malignancy owing to the fact that their partners suffered from a sexually transmitted infection, they had been diagnosed with a sexually transmitted infection, had history of smoking, had first sex debut at below 18 years or had more than 4 sexual mates, had an increased likelihood of perceiving their CC risk as more elevated than the ones with a minimal risk at 22% versus 6%, respectively (American Cancer Society, 2018).

In one study conducted in Kenya, among women living with HIV, cervical cancer screening was associated with at least having attained secondary education, being married and being employed (Kemper *et al*., 2022). This is because women who had employment, attained secondary education and being married are more likely to utilize cervical cancer screening as compared to other occupation, due to employed individuals

have over the years gained better opportunity to get exposure to information and awareness on cervical cancer screening (Ayanto *et al*., 2022).

In another study conducted in Kilimanjaro region, norther Tanzania, married or cohabiting women were more likely to partake cervical cancer screening services as compared to those who are single, divorced or widowed (Kimondo *et al*., 2021; Mwantake *et al*., 2022).

2.5.2 Association between knowledge of cervical cancer screening and utilization of cervical cancer screening services

Knowledge regarding cervical cancer and comprehending on the preventing measures such as screening are critical on the uptake of CC screening services. Several studies have shown that limited knowledge on cervical cancer screening among WLWHIV (Bula *et al*., 2022). Moreover, myths and misconception regarding the process of cervical cancer screening can also be a barrier in the utilization of the screening services as shown in one study conducted in Uganda where misconception such as stigma surrounding specimen intention taken by the healthcare workers, fear of receiving positive screening results and painful or uncomfortable exams. This deters WLWHIV from utilizing the screening services (Bula *et al*., 2022). In most studies WLWHIV had understanding on the need for cervical cancer screening services that screening is important in early identification of cervical cancer as well as helps in early treatment hence prevention of fatality (Bula *et al*., 2022; Getachew *et al*., 2019; Pierz *et al*., 2021).

In one study lack of knowledge among WLWHIV did not know that their HIV status is one of the predisposing factors to the development of cervical cancer and did not

understand the causes and risk factors such as having multiple partners and family history of cervical cancer are risk factors of getting cervical cancer. This implies that women in low- and middle-income countries have limited education on the causes and risk factors of cervical cancer screening that affects the utilization of the screening services(New-Aaron *et al*., 2020).

2.5.3 Association between attitude and utilization of cervical cancer screening services

Most WLWHIV understood the need for cervical cancer screening and were very willing to go for the CC Screening without presenting with the signs and symptoms of cervical cancer. Majority of these women had positive attitude towards the screening service and were comfortable enough to be screened for cervical cancer regardless of the gender of the healthcare worker (Kimondo *et al*., 2021; Mwantake *et al*., 2022).

A study conducted in Ethiopia among 516 respondents revealed a notable association linking attitude towards cervical cancer examination with utilization. Those with negative attitude towards the examination were 281 (54.5%) while those with positive attitude towards the examination were 235 (45.1%). However, 197 respondents represented by 38.2% admitted it was important to get cervical cancer examination while 217 respondents represented by 42.1% agreed testing for cervical malignancy (Tekle *et al*., 2019).

Attitude powerfully affects people's habits. Attitudes express approval or disapproval regarding events, people, things or places. Women's attitudes towards cervical cancer screening may be relevant as far as utilization of the service is concerned.

Attitude towards cervical cancer examination as shown by one Thailand research uncovered that female involved in sex trade, HIV positive and had negative attitude towards a Pap test had the least likelihood of ever receiving a screening test in comparison to women who had a positive attitude In addition, embarrassment can lead to a negative opinion towards screening especially in Somalia where women have undergone female genital cutting (Gelibo, 2018).

2.5.4 Association between health system factors and utilization of services for cervical cancer screening

Availability of staff, reagents, equipment; - For screening to be successful, there is a need to have enough staff who will carry out the examinations as well as avail resources which will help to diagnose, treat, and do follow up. Before establishing programmes for women to be screened, the above recommended prerequisites should be ensured. (NCSG, 2018).

Availability of cervical cancer screening services; - For screening to be successful, there is a need to be adequately equipped with staff who will carry out the screening exercise together with availing amenities to diagnose, treat, and follow up. Before establishing screening programmes, recommended prerequisites state that sufficient supplies should be made available of adequate resources for example human resources plus equipment. These will serve majority of the women targeted. Equipment for confirming diagnosis together with treating should be made available for cancer-positive women (National Cancer Screening Guidelines, 2018).

Privacy: - This is freedom from intrusion, and it relates to all personal or sensitive information and practice that is nature to individual. Patients including women living

with HIV are entitled to have their privacy and dignity maintained throughout all stages of medical treatment. They also have a basic entitlement to have their hospital reports kept privately and confidentially informed consent as well to information relating to dangers associated with the healthcare procedure. (WHO, 2014). Ensuring privacy is a key element alongside more practical aspects such as having women's bodies covered during cervical cancer screening (Binka *et al*, 2019.)

Number of hospital visits; - This pertains to the visits made by women living with HIV to the hospital for screening, results, counseling, treatment and follow up in regard to cervical cancer. They also have visits to make for HIV care and treatment. One of the main advantages of VIA as a method of screening is the possibility of getting an instant report of the test outcome making it practical to commence treatment on the same day called "screen-and-treat" approach (NCSG, 2018).

2.6 Summary of literature review

Cervical cancer is one of the most considered progressive and aggravated cancers that are predominantly found among women with immunocompromised patients especially those living with HIV/AIDS. Several studies have shown that WLWHIV are at an increased risk of developing invasive cervical carcinoma and cervical dysplasia as well as acquiring Human Papilloma Virus that increase the susceptibility of cervical cancer. Screening technologies like the VIA have been successfully integrated in middle- and low-income countries to offer screening during primary care visits in the CCC for WLWHIV. However, Intergradations has posed burden to the health system as there is increased workload for service providers and poor resource allocation.

Moreover, individual barriers that hinders cervical cancer screening among WLWHIV include inadequate knowledge about Human Papilloma Virus, development of CC, low level of education, distance to the facility, low income and community beliefs about how successful traditional healing is, encourages utilization of traditional medicines to treat cancer of the cervix Cervical cancer screening is considered as routine care among all HIV/AIDS management providing institutions however, testing for the cancer in HIV positive women continues to be low. Uptake of cervical cancer screening services is still low in Machakos county in spite of availability of free screening services.

Little attention has focused on the determinants of utilization of this service in this high-risk group, information that is critical for the county government in the design of interventions aimed at reducing the double burden of cervical cancer and HIV. It is therefore important to identify factors that have an effect on the screening of cervical cancer among women living with HIV/AIDS to improve integrated delivery of cervical cancer screening programs and services in Machakos County. This research therefore identifies demographic associations, knowledge, attitude and health system factors at CCC centers in Machakos county health facilities where WLWHIV get their services.

CHAPTER THREE:MATERIALS AND METHODS

3.1 Study design

An analytic cross- sectional study design. The design enabled the researcher to describe how CCS services are utilized and the associated factors among women living with HIV without influencing their behavior in any way.

3.2 Variables

3.2.1 Independent Variables

Socio-demographic characteristics: age, ethnicity, sex, ethnicity, religious affiliation, marital status, family size and education influence how CCS services were utilized.

Knowledge: The ability to identify the importance of cervical cancer screening, perceived risk of cervical cancer and availability of screening services. A five-point Likert Scale was developed to measure level of knowledge of cervical cancer. The questions developed were on the risk factors, causes of CC, prevention strategies, attitude and myths and misconception. A respondent was scored based on series of questions in the questionnaire. Each question had five correct choices which attracted five points. A respondent who scored 3 out of the possible 5 points were considered knowledgeable whereas respondent who score 2 out of the possible 5 were considered having inadequate knowledge

Attitude- the norm, position or belief that women have towards cervical cancer disease, positive results, cervical examination. To determine the level of attitude, the Likert

scale was used. Five responses were used that is always, often, sometimes, rarely, and never.

Health System Factors- They expose people to usage of medical services such as staff encouragement to get screened**,** availability of staff, reagents, equipment**,** privacy, cost to health facility, cost of services, duration taken to get results and number of hospital visits.

3.2.2 Dependent Variables

Cervical Cancer Screening

This research defined cervical cancer screening by utilizing the up-to-date cervical cancer screening updates by the MOH. According to the policy document, the target age group in Kenya for cervical cancer screening is among the women living with HIV/AIDS, while the screening frequency varies, for HIV-positive women, screening interval of 12 months is recommended while for HIV- negative women, an interval of 5 years is recommended while using VIA (MOH, 2018). Therefore, we defined adherence for CC screening services, if the participant within the 12 months period received CC Screening and the later as not adhered

3.3 Inclusion criteria

i. Women who are HIV positive based on their medical records.
ii. Women aged 18 to 49 years.
iii. Women who were able to provide written informed consent.

3.4 Exclusion criteria

Those who would have met the inclusion criteria but

i. Women who were critically sick during the data collection.

ii. Women who visiting the CCC during the research but are not residents of Machakos County.

3.5 Location of the study

Machakos County lies between 1°16' South and 37°19' east. The county shares borders with the following counties: Embu- northern side, Kiambu together with Nairobi counties- west, Makueni- south, Kajiado- southwest, Kirinyaga and Muranga- northwest, and Kitui- east. Population distribution of Machakos county is 711,191 females against 710,707 males and intersex 34 (KNBS, 2019). Machakos County was selected in 2019 as one of the four counties piloting (UHC) universal health care. Machakos County attracts many people seeking health care services and especially at the level five hospitals which has been fully equipped as a referral hospital. Those from Machakos County receive free services while those from neighboring counties pay half price under UHC making services accessible and affordable. Purposive sampling was used to select Machakos County Referral Hospital, Kangundo and Kathiani level 4 hospital due to these facilities benefiting from UHC and addressing a large proportion of women living with HIV/AIDS accessing cervical cancer screening services.

3.6 Target population

It comprises HIV-positive females aged 18-49 within Machakos County. The estimated numbers of females in this group is 1,842 women (Machakos County Government, 2020). New cases of Cervical cancer screening stand at 106 cases among this population (Kamita *et al*., 2021).

3.7 Study Population

Women living with HIV accessing services at 3 CCC in Machakos County estimated at 1,842 women.

3.8 Sampling Techniques

The study was conducted in 3 CCC that have the highest enrollment and are located in 3 sub-counties within Machakos County (Kenya Coordinating Mechanism, 2018). These are Machakos Level 5 Hospital in Machakos Sub County 987, Kangundo Level 4 Hospital in Kangundo Sub County 560 and Kathiani Level 4 Hospital in Kathiani Sub County 295. The respondents to be included in the study were distributed proportionally in each of the three sub-counties as shown in the table below. Due to the confidential nature of the information being sought from the respondents, they were identified using a systematic random sampling method. Eligible women accessing the CCC in the hospital who consented to participate were enrolled until the desired sample was achieved. The k^{th} respondent was identified by dividing 4 targeted populations of women living with HIV in the 3 months with 422 respondents. Therefore every 2^{nd} HIV positive woman was interviewed.

Table 3.1: Proportionate sampling as per facility

Facility Name	**No. of Active HIV-Positive Women**	**No. of Women Sampled**
Machakos Level 5 Hosp	987	343
Kangundo level 4 Hosp	560	67
Kathiani Sub County Hosp	295	12

Total	**1842**	**422**

3.9 Sample Size Determination

This is the means of creating those to be included in a numerical selection while securing representation.

The sample size was determined using the formula n=z2pq/d2. (**Source:** Fishers et al., 2003) where:

n is the desired sample size.

Z is the standard normal deviation (set at 1.96 corresponding to the 95% confidence level).

p = 0.5 assumed proportion of women using cervical cancer screening services.

q = 1.0-p; d is the degree of accuracy desired (0.05 level)

d= degree of accuracy 0.05

n $= \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384$

10% of respondents were added to cater for non-responses thus **422** respondents were recruited for interview).

3.10 Construction of Research Instruments

An interviewer-administered semi-structured questionnaire was adopted when collecting information on social demographics, knowledge, and attitude and health system factors that influence how CCS services are utilized. 3 FGDs were conducted among the three-health facility, and it comprised of 8-10 members and utilized a participatory approach to trigger discussions and provide clarifications on pertinent information concerning the knowledge, attitudes and socio-demographic and health system factors that influence the utilization of CCS services. This method also explores

perceptions and attitudes in more depth. Kiswahili was used since the language is well known and widely used among the community in Machakos county.

3.11 Pre-testing

The tools were pretested on 30 HIV positive women at the CCC in Kajiado County hospital. The facility is deemed to have a client population that is similar to that served at the CCC at Machakos County hospitals. Ambiguous, irrelevant and wrongly worded items was corrected and/or removed to refine the research tools to meet the objectives of the research.

3.12 Validity

For content Validity, questions asked were derived from research objectives. Also, investigation shall be limited to the area of study. Training as a research assistant was also done to ensure they familiarize themselves with the research tools. Pretesting of the research tools was also done

3.13 Reliability

This research study ensured reliability of the research tools through. Pretest was done and all procedures of the pretest were as those of the actual research data collection procedure to ensure the research tools give consistent results. Internal consistency was measured by the Cronbach's alpha (Cronbach, 1951), this alpha was conducted on 30 WLWHIV at CCC in Kajiado County. The reliability threshold used in this research study was ≥ 0.7.

3.14 Data collection Techniques

The interviewer administered a structured questionnaire in a private and comfortable room located within the CCC. The questionnaire was in English however, the interviewer uses Swahili for the respondents who prefer it. Two FGDs comprising of 8-12 women was also held in a private and comfortable room within the CCC.

3.15 Data Analysis

The data was first assessed for completeness then coded then exported to R to be analyzed. Data was then analyzed for descriptive statistics using means, range standard deviation for continuous variables and proportions and percentages for qualitative variables. Bivariate logistic regression analysis was utilized to determine the crude odd ratio (COR) to identify the independent variable associated with adherence of CC screening. Independent variable with $p<0.05$ in the bivariate analysis were included in the multivariable logistic regression model to determine the adjusted odd ratio (AOR). Multivariate analysis was conducted to control for the potential confound.

3.16 Logistical and Ethical consideration

Ethical clearance was sought from Kenyatta University Review Committee. A permit to carry out the study was obtained from National Commission for Science, Technology and Innovation (NACOSTI). Authority for carrying out the study was sought from the county's health office and the county's education office. The rights to respecting human dignity, beneficence, informed consent, together with justice shall be observed to protect study respondents. An informed consent was obtained before they take part in this research. Participating was voluntary and participants had the right of withdrawing

from the study at any stage and their decision was respected. The study participants were assured of privacy, anonymity and confidentiality through coding questionnaires so as to maintain anonymousness of all participants. Copies of the signed consent forms were stored in a lockable shelf. Access to the keys was controlled by the researcher.

CHAPTER FOUR: RESULTS

4.0 Introduction

A total of 410 out of the 422 women of reproductive age (18-49 years) responded to the questionnaire giving a response rate of 97.16%, with 249 (60.73%) respondents having been screened within 12 months for cervical cancer with 161 (39.27%) having not screened for cervical cancer screening within 12 months.

4.1 Socio-demographical Characteristics

The mean age of the participants was 31.68 (30-40), Participants 163 (39.76%) were between the ages of (21-30 years). Most of the participants were Christians 400 (97.56%), self-employed 276 (67.32%), with 162 (39.51%) having a household income of below 10,000. Forty-nine percent (201) of the participants were married. A total of 188 (46%) participants had secondary level of education. Out of the 432 participants, 422 identified as Christians and only 10 as Muslims. This imbalance may have influenced the analysis of data, and the interpretation of the results, as different religious beliefs and practices may affect the attitudes and behaviors of the respondents. This is shown in table 4.1

Table 4.1: Socio-demographic characteristics of women of reproductive age (18-49 years)

Variable	Frequency (n)	Percentage (%)
Age of women (Years)		
18-20	36	8.78
21-30	163	39.76
31-40	134	32.68
41-49	77	18.78
Level of education		
No-formal education	32	7.81
Primary education	114	27.80
Secondary education	188	45.85
Tertiary education	76	18.54
Household income (Kshs)		
Below 10,000	162	39.51
10,000-19,999	158	38.54
20,000-29,999	57	13.90
30,000-39,999	31	7.56
Above 40,000	2	0.49
Marital status		
Single	142	34.63
Married	201	49.02
Divorced	38	9.27
Widowed	29	7.07
Religion		
Christian	400	97.56
Muslim	10	2.44
Source of income		
Self-employed	276	67.32
Employed	134	32.68
Number of pregnancies		2.62
Number of living kids		2.34

4.2 Knowledge of cervical cancer screening

Three hundred and sixty-four, 364 (88.78%) research participants were knowledgeable on cervical cancer. Among those who were knowledgeable about cervical cancer screening, 79.27% got information regarding CCSC from a medical expert and the least source of cervical cancer information was from friends/relatives. Less than half, 143 (35%) knew that Human Papillomavirus (HPV) is the main cause of CC. Notable is that 65.1% (37.8,17.8 & 9.5) were either unaware of the causes of CC or thought that it was caused by HIV or bacteria respectively. One hundred and ninety-nine, 199 (48.54%) research participants knew pap smear as the most common screening procedure. More than half of research participants 247 (60.24%) preferred a public facility as the screening center for CC screening.

Women also mentioned receiving health education on cervical cancer screening from health facility that influence their knowledge as shown from the FGDs

"The facility offers regular group health education to women and individual counselling for cervical cancer screening services. I receive so much information that I also share with my friends and family. I am grateful for their help."

"Every morning that I come to the facility, there is health education on various women's health including cervical cancer screening. it is very helpful for us women and I usually look out for health education and don't want to miss out on the session."

"Every once in a month, the facility offers group health education to women. At first, I saw the meeting as a waste of time and would dodge every time, but once I was found to have cervical cancer and was assisted by scrubbing it off, I have never missed even once such meetings and even urge my fellow friends to seek for the service"

Table 4.2: Knowledge of cervical cancer screening N=410

Variable	Frequency (n)	Percentage (%)
Awareness of cervical cancer		
Yes	364	88.78
No	46	11.22
Source of information regarding CC Screening		
Medical experts	325	79.27
Family/friends	42	10.24
Self-learned	23	10.48
Causes of cervical cancer		
HPV	143	34.88
Don't know	155	37.81
HIV/AIDS	73	17.80
Bacteria	39	9.51
Available CC screening procedure that you know		
Pap smear	338	82.44
VIAL/VILLI	44	10.73
Colposcopy biopsy	4	0.96
Don't know	24	5.85
Available Cervical cancer screening procedure that you know		
Pap test	199	48.54
HPV test	14	3.42
Vaccines	98	23.90
VIA/VILLI	56	13.66
Don't know	43	10.49
Know that early detection of CC is important		
Yes	389	94.88
No	21	5.12
Preferred screening center		
Public facilities	247	60.24
Private facility	6	1.46
Didn't screen	157	38.30

4.3 Attitude towards cervical cancer screening

Five questions in the questionnaire were used to measure attitude. A 5-point Likert scale was used in each question ranging from often, sometimes, rarely, never and always to measure the level of agreement in each question. From the result more than half of the respondents 245 (59.76%) agreed that they sometimes talk openly about cervical cancer in their locality. Almost all respondents 395 (96.34%) did not believe that cervical cancer was a punishment from God, and 297 (72.44%) respondents felt that women should be allowed to make health related decision. Nine out of ten women 90%, knew that cervical cancer cannot be treated by traditional healers.

From the FGDs women mentioned long line of screening, nurses' attitude and lack of equipment as demoralizing factor to CCSS.

"The long line at the screening bay usually demoralizes me. I don't like waiting for long for the service. Sometimes I just give up and head home also because of COVID-19 regulations, I just have to keep away from crowded areas."

"Lack of equipment is demoralizing. One time I came for screening for cervical cancer screening and I was informed there was a lack of very important equipment. The way I was very prepared for the screening, I became heartbroken and it took me several months to go for the screening. What if I had cervical cancer at that time, what could have happened? I urge the hospital administration to look into the issue"

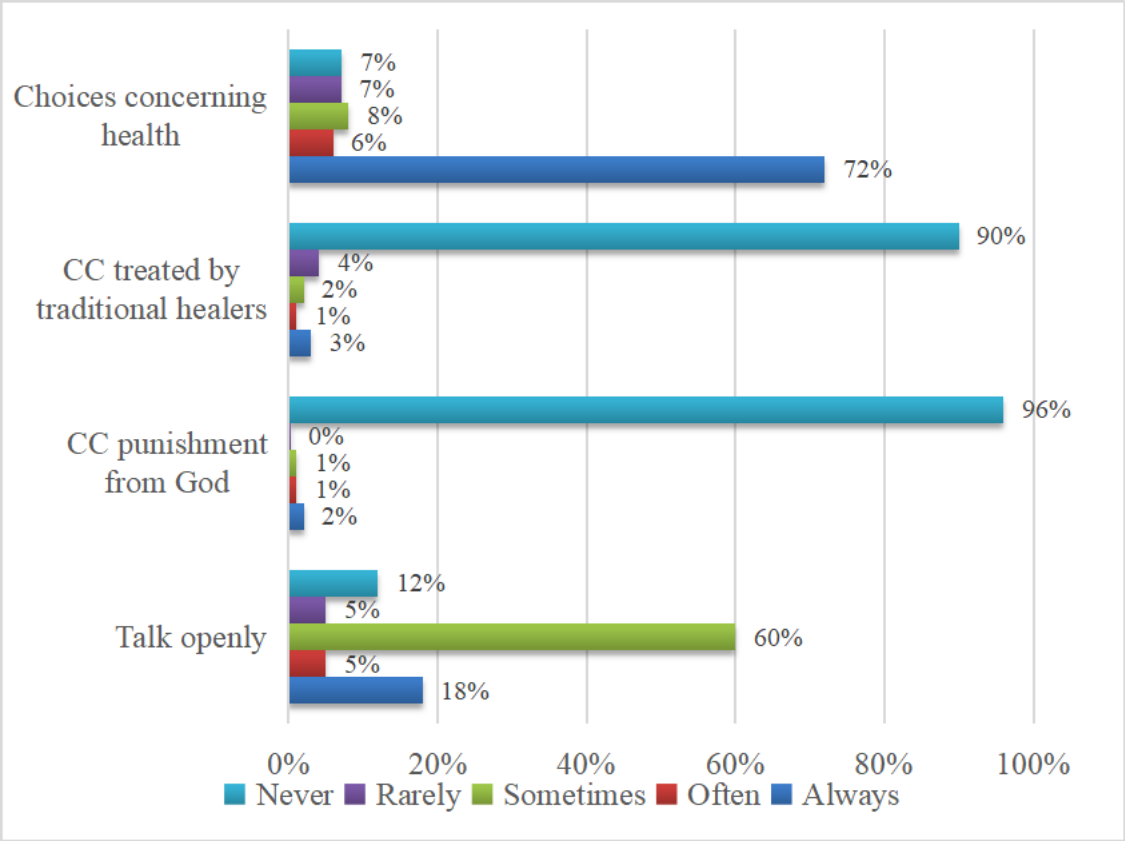

Figure 4.1: Attitude of cervical cancer screening

4.4 Health system factors

Most of the participants 380 (92.68%) rated health workers at the facility as being empathetic and friendly, 215 (52.44%) allowing clients to ask questions, 317 (77.32%) giving clear instruction on procedures and 350 (85.37%) were willing to address the clients' concern. Women also mentioned lack of availability of resources, inadequate outreach programs and inadequate community health volunteers as health system factors affecting CCSS in the community

"The last time I heard about cancer screening outreach I was in the market place. the say the service is helpful for women to detect cancer. However, that was long time ago and I have never heard of such outreaches again"

"The Community Health Volunteers area great factor when it comes to mobilizing women to get medical services in the community. Factoring their services can be a good motivator for women to embrace the screening services"

"Community champion can be used to demonstrate the benefits of these services for they have undergone the procedure and can attest to the benefits that come with the screening"

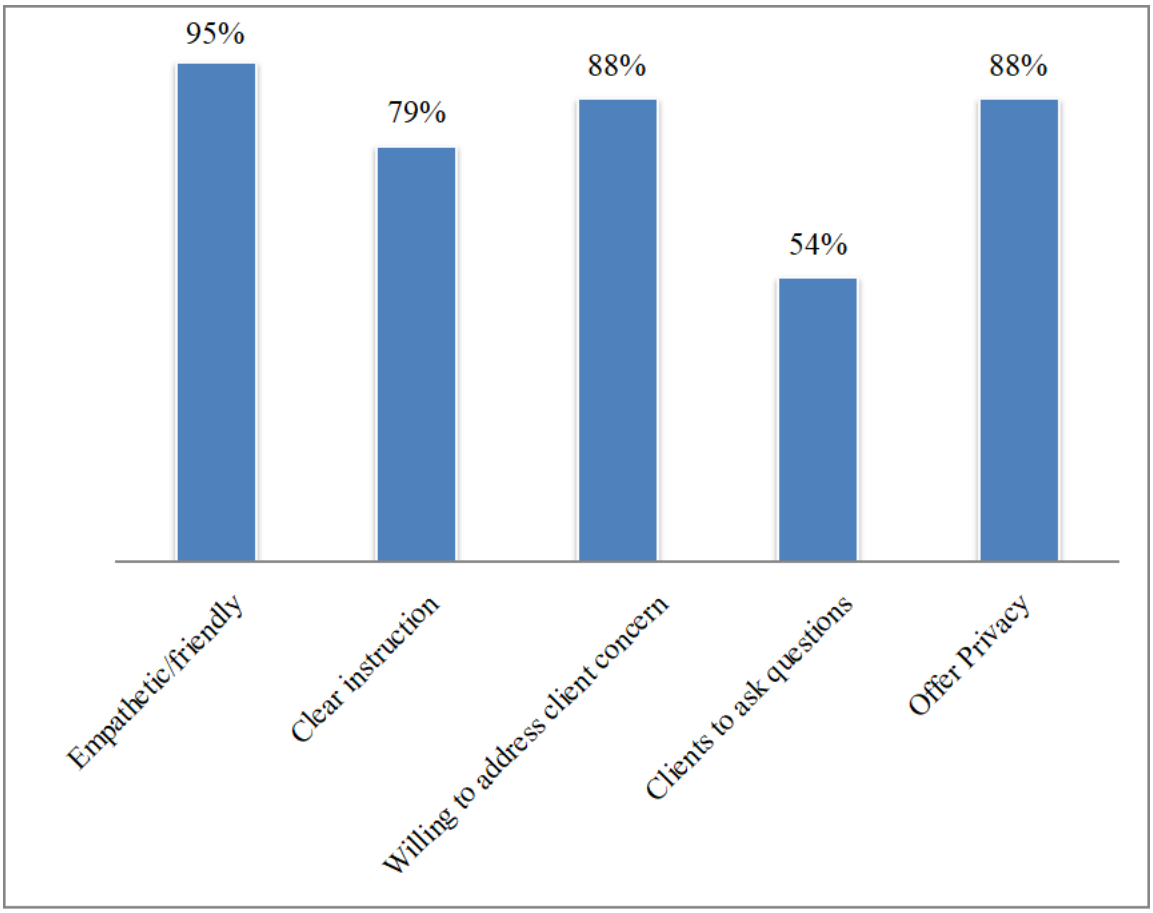

Figure 4.2: Health system factors

Most of the research participants303 (74%) reported that lack of laboratory equipment was the reason for being turned away from taking cervical cancer screening. More than

three-quarters of the participants 307 (75%) reported that the cervical cancer screening services were free, and it took less than one hour to get the results.

4.5 Bivariate analysis of the factors associated with utilization of cervical cancer screening services among WLWHIV.

4.5.1 Socio-demographic factors

Bivariate analysis showed that the variables that were significantly associated with cervical cancer screening was age(p=<0.001) and religion (p=0.050). Women living with HIV who were in the ages of 31-40 years were 2.758 times (OR= 2.758, 95% CI (0.138-8.076), p<0.001) more likely to utilize cervical cancer screening than their counterpart in other age brackets. Additionally, Christians were 5.953 times (OR 5.953, 95% CI (0.297, 17.418) P=0.050) more likely to utilize cervical cancer screening services than Muslims (Table 4.5).

4.5.2 Knowledge and utilization of cervical cancer screening services

Bivariate analysis on knowledge of CC showed that was significantly associated with cervical cancer screening at a p-value of 0.2 where participants who were knowledgeable on cervical cancer were 10 times (OR 10.210,95% CI (4.649-22.423) more likely to utilize CCSS than those who had limited knowledge on cervical cancer screening services (CCSS). Women who received information from healthcare workers were 1.255 times more likely to go for cervical cancer screening services (OR 1.255,95% CI (0.659-2.38) compared to those who received from others. However, this did not reach a statistically significant level of (p=0.05). (Table 4.5).

4.5.3 Attitude and Cervical Cancer Screening Services

Bivariate analysis on attitude and cervical cancer screening services showed that women who believed early detection was important, women who would go for screening if not sick and those who share information in the community about CC were more likely to utilize cervical cancer screening services. Women who would go for screening "if not sick" were 19.32 times (OR 19.317, 95% CI 11.788-31.079), P=<0.001) more likely to go for CC screening services than those who wouldn't go. Women who believed early detection was important were 2 times more likely to go for CCSS than those who didn't belief in early CC detection (OR 2.839, 95% CI (2.488-3.240, P=<0.001). Women who share information in the community about CC were 8 times more likely to uptake cervical cancer screening cervices than those who never share information of CC (OR 8.495, 95% CI 5.425, 13.079 P=<0.001). (Table 4.5)

4.5.4 Health system factors and cervical cancer screening services

Bivariate analysis on the health system factors associated with cervical cancer screening services was those who were recommended by medical worker (P=<0.01) and health education on cervical cancer screening services (p=<0.039). Women who were recommended by medical worker were more likely to screen for cervical cancer screening (OR 19.317, 95% CI 0.001, 0.011, P=<0.01). Women who received health education regarding cervical cancer screening services were 1.636 times more likely to go for screening for cervical cancer (OR 1.636, 95% CI 0.413, 0.979, P=<0.039) than those who did not receive health education on cervical cancer screening services. (Table 4.5.)

Table 4.5: Bivariate analysis on factors associated with cervical cancer screening.

Variable	Total (410)	Screened	Not screened	OR	P value	95% confidence interval	
		249 (60.73)	161(39.27)			Upper	Lower
SOCIODEMOGRAPHIC CHARACTERISTICS							
Age							
< 20 years	36 (8.78%)	15(42%)	21(58%)	2.758	<0.001*	0.138	8.076
21-30 years	161 (39.76%)	80(49.7%)	81(50.3%)				
31-40 years	134 (32.68%)	94(70.1%)	40(29.9%)				
41-50 years	77 (18.78%)	17(22.1%)	60(77.9%)				
Level of education							
No formal education	32 (7.81%)	18(56.3%)	14(43.7%)	1.097	0.798	0.548	4.324
Primary	114 (27.80%)	96(84.2%)	18(15.8%)				
Secondary	188 (45.85%)	133(70.7%)	55(29.3%)				
Tertiary	76 (18.54%)	55(72.4%)	21(27.6%)				
Religion							
Christian	400 (97.56%)	254(63.5%)	146(36.5%)	5.953	0.050	0.297	17.418
Muslim	10 (2.44%)	9(90%)	1(10%)				
KNOWLEDGE							
Level of Knowledge of CC							
Adequate knowledge	364 (88.78%)	255(70.1%)	109(29.9%)	10.210	<0.001*	0.511	32.826
Inadequate knowledge	46 (11.22%)	8(17.4%)	38(82.6%)				
Source of information regarding CC Screening							
Health care worker	325 (79.27%)	230(70.8%)	95(29.2%)	1.255	0.489	0.659	2.38
Others	42 (10.24%)	30(71.4%)	12(28.6%)				
Friends/family	43 (10.59%)	5(11.6%)	38(88.4%)				
ATTITUDE							
Believe on early screening of CC							
Yes	389 (94.88%)	277(71.2%)	112(28.8%)	2.839	<0.001*	2.488	3.240
No	21 (5.12%)	0(0%)	21(100%)				
women who believe in early screening of cervical cancer even when not feeling sick							
Yes	248 (60.49%)	212(85.5%)	36(14.5%)	19.317	<0.001*	11.788	31.079
No	162 (39.51%)	132(81.5%)	30(18.5%)				
Information sharing regarding cervical cancer screening in the community							
Yes	239 (58.29%)	200(83.7%)	39(16.3%)	8.495	<0.001*	5.415	13.079
No	171 (41.71%)	119(69.6%)	52(30.4%)				
CC is punishment from God				1.310	0.330	0.760	2.258
Can be treated by witches				1.173	0.572	0.675	2.035
HEALTH SYSTEM FACTORS							
Health education regarding cervical cancer screening services							
Yes	298 (72.68%)	180(60.4%)	118(39.6%)	1.636	0.039	0.082	6.486
No	122 (27.32%)	98(80.3%)	24(19.7%)				
Who led you to screen for CC							
Healthcare worker		325(79.268%)		0.003	<0.001*	0.001	0.011

Family	42(10.244%)
Others	43(10.488%)

4.6 Multivariable analysis of the factors associated with cervical cancer screening among WLWHIV

The variables in bivariate analysis that showed a significant finding to control for attributed factors were included in the multivariate logistical regression. The multivariate analysis showed that factors that had a strong association with cervical cancer screening were knowledge on cervical cancer and attitude of cervical cancer. Those who were knowledgeable were 3.67 times (AOR=3.67, 95% C.I (1.29-6.50) more likely to utilize cervical cancer screening than those who had no knowledge on cervical cancer screening and attitude on would you prefer cervical cancer screening if not sick they were 5.46 times (AOR = 5.46 95% C.I (2.34-11.67)) more likely to go for screening than their counterpart. Factors that lost their statistically significant in the multivariate analysis were age, religion, believe on importance of early detection of cervical cancer, information sharing on cervical cancer screening in the community, what led to screen for cervical cancer. (Table 4.6)

Table 4.6: Multivariable analyses of the factors associated with cervical cancer screening among WLWHIV

Variable	N=410	Screened	Not screened	P-Value	Adjusted Odd Ratio
Age					
< 20 years	36 (8.78%)	15(42%)	21(58%)	0.084	1.16(0.67-3.06)
21-30 years	161 (39.76%)	80(49.7%)	81(50.3%)		
31-40 years	134 (32.68%)	94(70.1%)	40(29.9%)		
41-50 years	77 (18.78%)	17(22.1%)	60(77.9%)		
Religion					
Christian	400 (97.56%)	254(63.5%)	146(36.5%)	0.250	0.46 (0.12-1.12)
Muslim	10 (2.44%)	9(90%)	1(10%)		
Level of knowledge					
Adequate knowledge	364 (88.78%)	255(70.1%)	109(29.9%)	<0.001	3.67 (1.29-6.50)
Inadequate knowledge	46 (11.22%)	8(17.4%)	38(82.6%)		
Believe on early screening of CC					
Yes	389 (94.88%)	277(71.2%)	112(28.8%)	0.376	1.32 (1.65-4.43)
No	21 (5.12%)	0(0%)	21(100%)		
women who believe in early screening of cervical cancer even when not feeling sick					
Yes	248 (60.49%)	212(85.5%)	36(14.5%)	<0.0001	5.46 (2.34-1.67)
No	162 (39.51%)	132(81.5%)	30(18.5%)		
Information sharing regarding cervical cancer screening in the community					
Yes	239 (58.29%)	200(83.7%)	39(16.3%)	0.967	0.64 (0.13-1.32)
No	171 (41.71%)	119(69.6%)	52(30.4%)		
Who led you to screen for CC?					

Healthcare worker	325(79.268%)	0.417	1.49 (0.38-4-49)
Family	42(10.244%)		
Others	43(10.488%)		

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussions

5.1.1 Introduction

Findings from this research indicated more than half of the women living with HIV (WLWHIV) 249 (60.73%), were screened and therefore adhered to cervical cancer screening, compared to 161(39.27%) who did not adhere hence were not screened within the last 12 months. This has shown a higher cervical cancer screening for WLWHIV than the national estimate of 16.4%(MOH, 2018). In this context, those adhered had gone for screening for screening for less than 12 months. The larger proportion who reported receiving cervical cancer screening is attributed to regular contact with the healthcare system, higher women's engagement with care and more women being placed on ART. Also, according to the laws and the Kenyan regulation, women living with HIV and on ART, require contact with health facility on regular basis and therefore get screened for Cervical cancer on a yearly basis. This finding is consistent with a previous study conducted in Kenya investigating correlates of cervical cancer screening among WLWHIV that found out more women living with HIV seek cervical cancer screening due to interaction with the healthcare system (Kemper *et al*., 2022). The finding is also similar to studies carried out in Tanzania (Kimondo *et al.*, 2021; New-Aaron *et al*., 2020), Ethiopia(Tadesse *et al*., 2022) and Zimbabwe (Taghavi *et al*., 2022). This shows that WLWHIV is more aware of their health and takes a keen

interest in their lives. However, these results are inconsistent with studies carried out in Northwest Ethiopia at 5.1% (Aynalem *et al.*, 2020) and Nigeria at 11% (Eze *et al.*, 2018)

5.1.2 Socio-demographic characteristics and utilization of cervical cancer screening

This research study showed that women's age is significantly associated with the utilization of cervical cancer screening. This finding is consistent with a study in Addis Ababa, Ethiopia where over one third (36%) of the WLWHIV who screened for CC were between the ages of 25 to 30 years (Getachew *et al.*, 2019), Zimbabwe (63%) (Taghavi *et al*., 2022), Kenya (56%) (Kemper *et al.*, 2022) and Tanzania (49%) (New-Aaron *et al*., 2020). This may be possibly explained by as women's age increases, they probably get more information regarding cervical cancer screening, therefore, increasing their chances of utilizing CC screening and their increased chances of interacting with the health care facility.

Uptake of cervical cancer screening in this research showed that women who were more educated (45.9%) and had a higher level of income (59%) (above 10,000) utilized CC Screening services. Education equips women with knowledge, therefore, increased knowledge of the importance of cervical cancer screening and their ability to make informed choice decision autonomy due to the financial freedom they have. These findings are also similar to a study carried out in Sub-Saharan Africa (Ibrahim Khalil *et al*., 2022), Kenya (Lukorito *et al.*, 2017; Tiruneh *et al.*, 2017), Malawi (Bula *et al*., 2022), Bahrain (Jassim *et al*., 2018) and Addis Ababa, Ethiopia (Getachew *et al*., 2019).

In this research, HIV positive women who had more than three children were more likely to utilize cervical cancer screening services than those with no children. These women regularly attend and interact with the health facility more than the nulliparous for routine HIV care. Hence, they have more chances of getting information from their peers and health care providers and have a better understanding of cervical cancer screening services which in turn inform their choices regarding cervical cancer screening and better utilization of these services. This finding is consistent with a study conducted in North West Ethiopia (Nega *et al*., 2018)

5.1.3 Level of knowledge and utilization of cervical cancer screening

Results from this study highlighted that most women living with HIV had adequate knowledge on cervical cancer, source of information 77.86% treatment options and the available cancer screening services information within the attended facilities. A larger proportion of women had information regarding cervical cancer services, cervical cancer screening options available at the facility, and predisposing factors to cervical cancer. These findings are consistent with studies in Sub-Saharan Africa (Ibrahim Khalil *et al*., 2022), Nairobi, Kenya(Lukorito *et al.*, 2017) and Bahrain (Jassim *et al*., 2018) that showed women had information regarding predisposing factors to cervical cancer that facilitated uptake of cervical cancer screening services.

Most of the WLWHIV (69%) in this research did not believe that living with HIV/AIDS has a higher probability of developing cervical cancer and many participants did not understand the primary causes of cervical cancer. Most of the participants (73%) also did not believe that having multiple partners increased the chances of cervical cancer

nor did they understand that having a family history of cervical cancer increases the probability of cervical cancer. These findings are consistent with studies in Africa (Bogale *et a*l., 2021)Tanzania (New-Aaron *et al*., 2020) and Kenya (Kemper *et al*., 2022). This gap in knowledge of the cause of cervical cancer is attributed to a lack of primary knowledge and can be bridged by the issue of access to information by giving the necessary and adequate information to WLWHIV (New-Aaron *et al*., 2020).

In this research study, healthcare workers' advice formed the basis for cervical cancer screening among women living with HIV/AIDS which is the same compared to other research studies in Tanzania, South Africa and Alabama (Kimondo *et al*., 2021; Makuvire *et al.*, 2018; Williams *et al*., 2017). However, about half of WLWHIV who had never gone for cervical cancer screening services did not know where to get cervical cancer screening, This is similar to studies in the Kilimanjaro region, Northern Tanzania (Kimondo *et al*., 2021), Uganda (Wanyenze *et al*., 2017) and Ethiopia (Getachew *et al*., 2019).

5.1.4 Attitude towards cervical cancer screening

More than three-quarters of women living with HIV (87.7%) in this research showed a positive attitude towards cervical cancer screening services which is similar to studies in Tanzania (Kimondo *et al*., 2021) and Ethiopia (Getachew *et al*., 2019). More than half of the research participants sometimes talked openly concerning cervical cancer screening. With 96.34% did not believe cervical cancer was caused as a punishment from God, 90% did not believe it was caused by witches and 72.44% were free to settle on their own choices regarding their health this research is similar to study in Bahrain

(Jassim *et al*., 2018) and Malawi (Bula *et al*., 2022). Empowering women to have the freedom to settle on their choice of health and come up with their own decision is necessary to improve their sexual and reproductive health (Tiruneh *et al*., 2017)

5.1.5 Health System factors that influence utilization of cervical cancer screening services

This research also showed that there is limited interaction and sharing of information on cervical cancer screening between health care providers and WLWHIV. Most women in this population had misconceptions regarding cervical cancer, even though some of them complied with the screening services based on the healthcare provider's recommendation, their lack of knowledge regarding the different test procedures impedes health behaviour. These findings are consistent with a study conducted in Canada (Wong *et al*., 2018). This reflects that there is very poor coverage of programs geared towards health education of WLWHIV on CC Screening services.

Distance to the health facility in this research findings showed a positive association with the utilization of cervical cancer screening services among this population. These findings are consistent with a study in Kenya that determined cervical cancer screening among women (Tiruneh *et al*., 2017)Women living in rural areas experience a low expectation of utilization of health services is a possible explanation. Other barriers such as lack of finances and lack of transportation to a health facility are also possible influential factor that influences cervical cancer screening services (Lim & Ojo, 2016). Programs should be factored in to increase cervical cancer screening services to

consider hidden costs such as lost earnings and transport costs when women seek screening services, especially in rural areas (Anne *et al*., 2018).

5.2 Conclusion

This study sought to determine the utilization of services that screen for cervical cancer and to establish the factors associated with it among the women living with HIV at Machakos County Hospital.In this study 410 out of 422 women of reproductive age (18-49years) responded to the questionnaire. Factors that were significantly associated with utilization of cervical cancer screening services were women who were knowledgeable (AOR=3.67, 95% C.I (1.29-6.50) and women who believe in early screening of cervical cancer even when not feeling sick were 5.46 times (AOR = 5.46 95% C.I (2.34-11.67).

5.3 Recommendations

5.3.1 Recommendations from the study

Ministry of Health under Public Health in Machakos County government should strengthen the capacity of their public health promotional programmes toward women living with HIV/AIDS to increase their knowledge about the benefits of early detection and screening of cervical cancer and imitate them to uptake positive preventive behavioural changes towards routine screening for cervical cancer screening. National AIDS Control council to incorporate cervical cancer screening as one of their core services for women living with HIV/AIDS. National AIDS and STI Control Programme should strengthen strategies and policies aimed to improve on uptake of CC screening programs.

5.3.2 Recommendations for further research

Further studies should be conducted to allow a more comprehensive approach to gaining knowledge on cervical cancer screening services among women living with HIV/AIDS by including healthcare providers in the study to determine the potential barriers to utilization of cervical cancer screening from the perspective of healthcare provider. Further research is also important in characterizing facility-level inadequacies in the delivery of cervical cancer screening services to support integrations efforts and equip health care facilities

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APPENDICES

Appendix I: Questionnaire

UTILIZATION OF CERVICAL CANCER SCREENING AND ASSOCIATED FACTORS AMONG WOMEN LIVING WITH HIV AT THE MACHAKOS COUNTY HOSPITAL, KENYA.

Dear Respondent,

Cervical cancer is a prevalent disease affecting women worldwide. The tool aims to assess your understanding, knowledge, practices and factors that affect your decision to utilize cervical cancer screening services. Please be assured of strict confidentiality with all your responses.

This questionnaire is anonymous, and your identity or name isn't needed.

Your participation is voluntary therefore there is no penalty if you refuse to participate.

Kindly respond to all questions truthfully as possible and to the best of your ability.

By ticking the box, I accept I have taken time to understand the instructions given and accept to take part in this study. ☐

Thanks for agreeing to take part.

Socio-Demographic Characteristics

1. Age: _____ (in years)

2. Education Level

None ☐

Primary ☐

Secondary ☐

Tertiary ☐

3. What is your household income per month in Kenya shillings_____

4. Current spousal relationship:

Single ☐

Married ☐

Divorced ☐

Bereaved ☐

Separated ☐

5. What kind of marriage are you practicing if married?

Monogamy ☐

Polygamy ☐

6. What was your age in years during your initial vaginal intercourse? _____

7. What is the number of pregnancies you have had? _____

8. What is the number of your living children? _____

9. Work history:

Employed ☐

Self employed ☐

Retired ☐

Knowledge about Cervical Cancer and utilization of CCS

10. Have you learned about cervical malignancy previously?

Yes ☐

No ☐

11. In the event that yes in 10) above from who?

Friend ☐

Relative ☐

Medical provider ☐

Mass-media ☐

Houses of worship ☐

More sources _____(indicate)

12. What causes cervical cancer?

HIV ☐

Human Papilloma Virus ☐

Bacteria ☐

Witchcraft ☐

Do not know ☐

Others _____ (Please Specify)

13. How is cervical cancer transmitted?

Sharing of inner clothes ☐

Hereditary ☐

Sexual contact ☐

Through kissing ☐

others ___ (Please Specify)

14. What predisposing factors to cervical cancer do you know?

HIV/AIDS ☐ HPV infection ☐

Early sex ☐ Multiple sex partners ☐

Sex with uncircumcised male ☐ Unprotected sex ☐

Smoking ☐

15. What cervical cancer screening procedures do you know?

Pap smear ☐ VIA/VILLI ☐

Colposcopy biopsy ☐ HPA/DNA testing ☐

16. What CC preventive methods do you know? (Check all applicable answers)

VIA/VILI ☐

Pap test ☐ Vaccines ☐

HPV testing ☐ Medications ☐

None ☐ More sources_____ (indicate)

17. Is detecting Cervical Cancer early helpful?

Yes ☐

No ☐

☐

18. Have you been done a screening examination any point in your life?

Yes ☐ **No** ☐

19. If yes, where did you screen?

Public facility ☐

Private facility ☐

20. Which one best describes your history of screening since you got to know your HIV status

I have not been screened for cervical cancer since knowing my health condition ☐

I screened for cervical cancer but not regularly/yearly since knowing my health condition ☐

I have screened for cervical cancer every year ☐

21. Who would you say has supported/encouraged you to go for cervical cancer screening? _____

22. What type of support did they offer you? _____

23. What led you to screen for cervical cancer? (Can give multiple reasons)

Medical worker's suggestion ☐

Adverts from TV/ radio/ newspaper/ pamphlets ☐

Family/ friends suggestion ☐

Attended counselling session ☐

Medical center counsellors ☐

Routine service in the facility ☐

24. Has a recommendation ever been made to you that you need to undergo screening for cancer of the cervix?

Yes ☐

No ☐

25. Who should be screened for cancer of the cervix?

Woman with symptoms of the disease ☐

Any woman who has had sex ☐

Promiscuous women ☐

Women whose partners are promiscuous ☐

Women living with HIV ☐

*Choose all applicable choices

26. Would you go for the screening if you were 'not sick'?

Yes ☐

No ☐

I do not know ☐

Attitude towards cervical cancer screening

27. People talk openly about cervical cancer in your locality?

Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never ☐

28. Cervical malignancy is a punishment from God.

Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never ☐

29. Cervical malignancy if from witches and sorcery?

Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never ☐

Cervical malignancy is only treated by witches and medicine men.

Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never ☐

30. Are women permitted to settle on choices concerning their health in your area?

Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never ☐

The health system factors

31. Kindly rate healthcare workers at the facility. (Can give multiple answers)

Empathetic/Friendly ☐

They give clear instructions about procedure. ☐

They allow clients to ask questions ☐

Willing to address client's concerns ☐

They offer Privacy during cervical cancer examination ☐

32. Do you know of someone who was turned away from taking cervical cancer screening because of absence of:

Staff ☐

Laboratory equipment ☐

Any other reason _____

33. What is the cost for travelling to the nearest cervical cancer screening center Kshs.....

34. What's the cost of a screening test ……

35. What length of time did it take before getting your screening results?

a) Hrs (Indicate)…….

b) Days (Indicate)…….

c) Wks (Indicate)…….

Appendix II: Focused Group Discussion Questionnaire

PART ONE: FACILITY DEMOGRAPHIC INFORMATION

1. FACILITY NAME

2. NO. OF HEALTH CARE PROVIDERS IN CCC (DOCTORS, C.O, NURSES)

PART TWO: CLIENT DEMOGRAPHIC CHARACTERISTICS AND CCS

1. Does your partner/spouse support you to seek cervical cancer screening services?
2. If they do, what kind of support do they give?

PART THREE: CLIENT KNOWLEDGE ON CERVICAL CANCER SCREENING

1. Do health workers remember to talk to clients about cervical cancer screening?
2. How often do you receive individual and group health education on cervical cancer screening at this clinic?

PART FOUR: CLIENT ATTITUDE AND PERCEPTIONS TOWARDS CERVICAL CANCER SCREENING

1. What incidences at the screening centre would demoralize you from seeking the services?
2. Are there counseling sessions before procedure and while receiving results to alley anxiety?

PART FIVE: HEALTH SYSTEM FACTORS AND CERVICAL CANCER SCREENING

1. Does the facility offer routine community cervical cancer screening outreaches
2. What interventions do you think can motivate women to embrace these services?
3. How would you describe the waiting time, staff attitude, availability of resources and privacy as far as the screening is concerned?

Appendix III: Machakos County Map

Appendix IV: Nacosti Authorization

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 474937

Date of Issue: 17/June/2021

RESEARCH LICENSE

This is to Certify that Ms.. RUTH Kanini NJAGE of Kenyatta University, has been licensed to conduct research in Machakos on the topic: UTILIZATION OF CERVICAL CANCER SCREENING AND ASSOCIATED FACTORS AMONG WOMEN LIVING WITH HIV IN MACHAKOS COUNTY, KENYA for the period ending : 17/June/2022.

License No: NACOSTI/P/21/11154

474937

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix V: Kenyatta University Ethical Clearance

KENYATTA UNIVERSITY
DIRECTORATE OF ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

P. O. Box 43844,

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: **KU/ERC/APPROVAL/VOL.1**

Date: 7th June, 2021

Ruth Kanini Njage
P.O Box 43844, 00100
Nairobi.

Dear Ms. Njage,

APPLICATION NUMBER: PKU/2256/I1400 UTILIZATION OF CERVICAL CANCER SCREENING AND ASSOCIATED FACTORS AMONG WOMEN LIVING WITH HIV IN MACHAKOS COUNTY

This is to inform you that ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** has approved version 4 of the study protocol together with the attached consent forms dated 12.09.2020. Your application approval number is **PKU/2256/I1400.** The approval period is ***7th June, 2021 TO 7th June, 2022.***

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE.***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be

reported to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE*** within 72 hours

v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE***.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

To serve you better, researchers are kindly requested to access and complete a customer feedback form and sent it back online as you continue with research and upon completion of data collection found on the following websitelink;(https://docs.google.com/forms/d/1ytWefDwvyz5h1oz_Vln0xbxg3uGdlDzMXFWNDsMrRPQ/edit?usp=sharing

Yours sincerely

Prof. Judith Kimiywe

DIRECTOR- KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE.

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
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P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: Q139/CTY/PT/27269/2018 **DATE: 15th March, 2021**

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. RUTH KANINI NJAGE – REG. NO. Q139/CTY/PT/27269/18

I write to introduce Ms. Ruth Kanini Njage who is a Postgraduate Student of this University. She is registered for M.P.H. degree programme in the **Department of Population, Reproductive Health & Community Resource Management.**

Ms. Njage intends to conduct research for a M.P.H. thesis Proposal entitled, **"Utilization of Cervical Cancer Screening and Associated Factors among Women Living with HIV in Machakos County, Kenya."**

Any assistance given will be highly appreciated.

Yours faithfully,

KENYATTA UNIVERSITY * OFFICE OF DEAN * 23 MAR 2021 * GRADUATE SCHOOL * P.O. Box 43844-00100 NAIROBI *

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

HI/eww