DETERMINANTS OF UPTAKE OF CERVICAL CANCER SCREENING SERVICES AMONG WOMEN OF REPRODUCTIVE AGE LIVING WITH HIV/AIDS ATTENDING NAKURU COUNTY, TEACHING AND REFERRAL HOSPITAL, KENYA

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DECLARATION AND APPROVAL.

Student declaration.

I, Ruth Anyango Omollo, affirm that this is my authentic work and that this research thesis was solely authored by me and has not been submitted for the conferment of any degree at this or any other university.

Signature. Date. 2nd July 2025.

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Approval by Supervisors.

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DEDICATION

I dedicate this work to my family, all recipients of cervical cancer screening services, and my academic mentors at Mount Kenya University and DAAD.

ABSTRACT

In sub-Saharan Africa, cervical cancer disproportionately affects women and girls. Cervical cancer among women of reproductive age living with HIV/AIDS is still quite common in Kenya, despite tremendous efforts to address the problem. The purpose of the present investigation was to investigate the variables that affect reproductive-age women with HIV/AIDS who attend NCTRH in terms of their utilization of cancer of the cervix screening services. The investigation used a mixed-methods technique for gathering data and an analytical cross-sectional study design. A structured questionnaire was used for gathering data in quantitative form, while key informant interviews were used to acquire data that is qualitative. SPSS version 25 was utilized to analyse the quantitative data, and inferential statistics such as regression analysis and chi-square tests were employed to evaluate the correlations between the variables. Statistical significance was established at a 95% confidence range for a P-value of 0.05. Thematic analysis was used to examine the qualitative data. With 78.9% of HIV-positive women attending NCTRH taking part in screening, the results showed a high uptake of cancer of the cervix screening. Age, education, marital status, employment, religion, parity, and other patient-related characteristics all had statistically significant effects on the use of screening services ($P<0.05$). The investigation also found that health-related factors like the cost of tests, healthcare workers' attitudes, facility location, availability of screening equipment, service provision, screening schedules, and waiting times were significantly associated with screening uptake ($P<0.05$). In conclusion, the use of cervical cancer screening services was high among HIV-positive women. Both patient-related and health facility-related factors were found to influence the utilization of screening services. These results highlight the critical role of awareness, healthcare-related factors, and the accessibility of screening services for women with HIV/AIDS. As a recommendation, healthcare providers and policymakers to strengthen awareness campaigns and improve access to cancer screening programs, particularly for WRA living with HIV/AIDS.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA Analysis of Variation.

CC Cervical Cancer

CCC Comprehensive Care Clinic.

CDC Centre for Disease Control and Prevention.

FGD Focus group discussion.

HPV Human Papilloma Virus.

IREC Institutional Research Ethical and Review Committee.

KII Key informant interview.

KNBS Kenya National Bureau of Statistics.

MOH Ministry of Health.

NACOSTI National Commission for Science, Technology and Innovation.

SDG Sustainable Development Goals.

SPSS Statistical Package for the Social Sciences.

WHO World Health Organization.

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CHAPTER ONE

INTRODUCTION

1.1 Background information

Globally, cancer is a major cause of death and a major barrier to raising the average lifespan (GLOBOCAN 2020). Cancer is the leading cause of mortality before the age of 70 in 112 out of 183 nations, according to the World Health Organisation (WHO), which emphasized this fact in 2019. Approximately 10 million people died from cancer, and about 19 million new cases were diagnosed, according to GLOBOCAN 2020. Regardless of a nation's level of development, cancer continues to be a leading cause of disease and mortality worldwide. According to GLOBOCAN 2020, the overall likelihood of cancer-related fatalities for women in Africa was nearly identical to that of women in North America and the richest European countries.

The fourth most frequent disease in the world to affect women is cervical cancer(CC). Globally, the World Health Organisation (WHO) reported 342,000 cancer-related deaths and 604,000 instances of new cases in 2020; nations with low or middle incomes accounted for over 90% of these fatalities (GLOBOCAN 2020). Women with HIV are six times more probable to acquire cervical cancer than women without HIV, and HIV type 2 is believed to be the cause of 5% of all CC cases. Furthermore, the impact of HIV on CC disproportionately affects younger women globally (Stelzle et al., 2020).

Roughly 85% of all CC deaths globally occur in middle- and low-income countries, where the death rate is 18 times higher than in wealthy countries. After tumours in the breast, cervical gland cancer is the second leading cause of death and occurrence in areas with lower Human Development Indexes (HDI). Despite this, it is the most common cancer in twenty-eight nations and the leading cause of fatalities due to cancer in 42 different nations, most of

which are in Sub-Saharan Africa and Southeast Asia. The highest fatality and incidence rates are seen in Africa (Zhang et al., 2020).

According to the 2018 worldwide report on the prevalence and mortality of cancer of the cervix, CC is the primary cause of cancer-related fatalities among women in eastern, western, central, and southern Africa in sub-Saharan Africa (Ouedraogo et al., 2021). The impact of cervical malignancies is highly unequally distributed throughout the African continent, and the region is expected to see a startling 85% increase in cancer cases by 2030. However, cancer of the cervix is one of the few malignancies that can be easily avoided and treated by means of vaccination, early identification, and appropriate treatment. Just 3.2% of women in Kenya between the ages of 18 and 69 have had cervical carcinoma screenings, which is a startlingly low uptake rate among women (Mbaka et al., 2018). Squamous cell carcinoma and adenocarcinomas are the two most common types of cancer of the cervix in Kenya (Whitham et al., 2017). According to the 2018 Kenya Population-Based HIV Impact Assessment (KENPHIA), women are twice as prospective as males to have HIV (6.6% vs. 3.1%). Women between the ages of 20 and 34 are more than three times as likely to be infected, making the gender disparity in HIV prevalence even more noticeable.

All nations must lower the incidence rate of CC to less than four cases per 100,000 women in order to eradicate the disease worldwide. Three crucial tactics and their corresponding objectives are necessary to accomplish this purpose. A thorough framework for tackling cervical carcinoma as a public health issue has been developed. Accordingly, the worldwide strategy to hasten the exclusion of CC as a serious health concern was endorsed by the World Health Assembly (WHO, 2018). A yearly incidence rate of under four cases per 100,000 women is the standard for eradicating CC. The WHO has set the 90-70-90 targets to be met by 2030 in order to meet this standard by the end of the twenty-first century. These goals are

to have 90% of girls receive the full HPV vaccine by the age of 15; cure 90% of women with cervical tumors (i.e., 90% of women with cancer that has advanced are under control and 90% of women with pre-cancer are cured); and have 70% of women screened by an effective test between the ages of 35 and 45.

1.2 Problem Statement.

As the fourth most common disease in women globally in terms of incidence and death, CC is the leading root of cancer-related death in 42 countries (WHO, 2019). HIV and cervical cancer are inextricably linked because women with HIV are significantly more probable to have HPV, the primary cause of cervical cancer. CC risk is at least five times higher for women with HIV than for those without the virus, according to research (CDC, 2017). The illness's impact is particularly severe in Sub-Saharan Africa, where women and girls bear the brunt of its burden (GLOBOCAN, 2020). According to projections, the number of cancer cases in the area is expected to surge by more than 85% by 2030. However, CC is still one of the most curable and preventable malignancies thanks to early detection, vaccination, and prompt medical attention (Jedy-Agba et al., 2020).

About 16.2 million women in Kenya who are 15 years of age or older are at risk of acquiring cancer of the cervix, according to data on HPV and related malignancies (MOH, 2019). According to annual estimates, 3,211 women die from CC each year, and 5,236 have been identified with the illness, with a higher incidence among those who have HIV/AIDS (WHO, 2019). In Kenya, among women of reproductive age, CC ranks as the second most prevalent type of cancer. HPV 16 and 18 are high-risk strains that cause 63.1 percent of invasive CC cases, and 9.1 percent of women in the general population carry them at any given time (GLOBOCAN, 2020). For Kenyan women, the illness continues to rank among the top

causes of cancer-related deaths. Just in 2018, there were 49,000 new instances of cancer and 33,000 fatalities. Sadly, nine Kenyan women lose their lives to CC every day (MOH, 2019). In Nakuru county, Cervical cancer is also of increasing significant public health concern. Kenya Demographic and Health Survey 2022 indicates a high screening rate of 65.9% among women in the study area.

1.3 Justification

Although a lot of research has been done on CC in Kenya, the disease is still quite common in women with HIV/AIDS who are of reproductive age. Despite the numerous interventions that have been put in place, this investigation sheds light on other variables that contribute to the high prevalence that persists. This investigation also aimed to raise awareness of CC prevention through early diagnosis and efficient screening techniques.

The third of the 17 objectives of the 2030 Sustainable Development Agenda is centered on guaranteeing everyone's health and well-being. In order to address cervical carcinoma as a public health concern, the World Health Organisation (WHO) has developed strategies. By the end of the twenty-first century, the goal is to eradicate CC by bringing the yearly number of incidences down to less than 4 per one hundred thousand women. By 2030, 90% of women should be evaluated with a high-efficiency test by the ages of 35 and 45, 90% of women with cervical anomalies should receive treatment, involving 90% of those with invasive cancer and 90% of those with pre-cancerous conditions, and 90% of girls should be vaccinated against HPV by the age of 15 (WHO, 2019). This study is therefore relevant and might significantly help the WHO achieve its 90-70-90 goals.

1.4. Objectives

1.4.1. Broad Objective

To assess determinants of uptake of cervical cancer screening services among women of reproductive age living with HIV/AIDS attending NCTRH.

1.4.2. Specific Objectives.

1. To determine the level of uptake of cervical cancer screening services among women of reproductive age living with HIV/AIDS attending NCTRH.
2. To determine patient-related factors (Knowledge, Socio-demographic Characteristics) associated with uptake of cervical cancer screening services among women of reproductive age living with HIV/AIDS attending NCTRH.
3. To determine health facility factors associated with the uptake of cervical cancer screening services among women of reproductive age living with HIV/AIDS attending NCTRH.

1.5 Research questions

1 What is the level of uptake of cervical cancer screening services among women of reproductive age living with HIV/AIDS attending NCTRH?

1. What are the patient-related factors associated with the uptake of cervical cancer screening services among women of reproductive age living with HIV/AIDS attending NCTRH?
2. What are the health facility factors associated with the uptake of cervical cancer screening services among women of reproductive age living with HIV/AIDS attending NCTRH?

1.6. Assumption of the study

1. This study assumes that the participants will be willing to participate and honestly respond to questions raised by a researcher, the sample size is representative and the results can be used to conclude the study population.
2. All reproductive-age women living with HIV/AIDS attending NCTRH Comprehensive Care Clinics have equal access to CC screening services.
3. Reproductive-age women living with HIV/AIDS are at the highest risk of developing CC among the population in Nakuru Town.

1.7. Limitations of the study

1. The research was limited to a single center and, therefore, lacked generalizability to the county and country. The limitation was addressed by ensuring that the level of bias is reduced by applying a better sample size calculation method and proper sampling techniques.

CHAPTER TWO
LITERATURE REVIEW

2.1. Introduction

Cancer is a disease characterized by the body's aberrant cells proliferating out of control. The term "gynaecologic cancers" describes cancers that arise in a woman's reproductive system; the four main forms are uterine, cervical, vaginal, and vulvar cancers. CC is the most treatable of these since it is the only one with established screening methods that enable early detection. It is still the only gynaecologic malignancy that can be detected early with ease and accuracy(Centres for Disease Control and Prevention [CDC], 2022).

Cancer is currently a significant global public health concern, according to GLOBOCAN (2020). CC is among the most easily preventable and treatable malignant cancers. Although it may be effectively treated with early detection and adequate treatment, it continues to be a major cause of cancer-related death in women worldwide. CC, one of the most prevalent cancers in women, is predicted to result in 604,127 new cases and 341,831 fatalities in 2020. The two most prevalent types of cervical carcinoma are adenocarcinoma and squamous cell carcinoma.

Cancer of the cervix reflects global imbalances more than most diseases. About 90% of 2018 fatalities took place in nations with low and middle incomes. The biggest cause of CC is the lack of screening and treatment options as well as restricted access to healthcare provided by the government WHO, 2018).

2.2. Risk factors of cervical cancer.

A risk indicator is any situation or element that raises a person's likelihood of developing cancer. Risk variables aid in the beginning and progression of the disease even when they are not its direct cause. While some individuals with no known risk variables may nonetheless receive a cancer diagnosis, others with multiple risk variables may never get the disease. The human papillomavirus, or HPV, is a common disease transmitted via sexual contact. Only HPV types 16 and 18 are known to induce abnormal changes in cervical epithelial that over time may result in CC, even though there are many distinct strains of the virus. Other types of HPV can cause genital or skin warts (CDC, 2021).

Most people are infected with the common human papillomavirus (HPV) at some point in their life. It can be difficult to identify its presence because it usually shows no symptoms, which leads to the infection going undetected. On the other hand, cervical carcinoma may result if the virus continues to exist over time (CDC, 2021). The odds of acquiring high-risk HPV strains are increased by having several sexual partners or having intercourse when underage. According to Mbaka et al. (2018), vaccines against HPV are among the best ways to prevent cervical carcinoma.

A person with immunosuppression is at a higher risk of getting CC. Organ transplants, corticosteroid drugs, cancer treatments, and the Human Immunodeficiency Virus (HIV), which causes AIDS, can all cause immunosuppression (Mbaka et al., 2018). HIV-positive people have weakened immune systems, which makes them less capable of preventing early cancer. According to other research, taking birth control pills or other methods of contraception may raise your risk of developing CC.

Multiple investigations have shown a link between immunosuppression and a higher risk of cervical carcinoma, particularly in those with HIV. According to Stelzle et al. (2020), women

with HIV have a six-fold increased risk of developing CC in comparison to those without the virus. Persistent HPV infections are mostly to blame for this increased risk since a compromised immune system finds it difficult to eradicate the virus. In a similar vein, a research investigation conducted in South Africa by Denslow et al. (2019) discovered that high-risk HPV persistence, a major contributing factor to the development of CC, was significantly more common in women with HIV. These results emphasize the critical necessity for early therapies for immunocompromised patients and routine CC screenings.

In addition to immune suppression brought on by HIV, other immuno-suppressive conditions like organ transplantation and long-term corticosteroid usage have also been connected to an increased risk of CC. Women who have received organ transplants are between two and three times more probable than the general population to acquire CC, according to research by Adham et al. (2021). Long-term use of immunosuppressive medications raises this risk since they prevent organ rejection but also make it more difficult for the immune system to fight off high-risk HPV strains. To identify precancerous alterations early on, the investigation underlined the need for specific CC screening techniques for transplant recipients.

Long-term corticosteroid treatment for autoimmune diseases has also been linked to a higher incidence of cervical anomalies caused by HPV. The long-term usage of prednisone and other immunosuppressive medications in people with rheumatoid arthritis and lupus was investigated in an investigation by Kang et al. (2020). According to the study, long-term usage of corticosteroids was linked to an increased risk of cervical intraepithelial neoplasia (CIN), which is a precursor to cervical cancer. These results highlight the twin challenges that people using long-term immunosuppressive medicine face: controlling their underlying illnesses while lowering their chance of developing malignancies linked to HPV.

Apart from immunosuppression, studies have also looked into how pills for oral contraception (OCPs) affect the risk of CC. According to a thorough meta-analysis conducted in 2019 by the International Agency for Research on Cancer (IARC), which looked at a number of epidemiological investigations, using OCPs for five years or more raises the risk of CC by almost 20%. According to the investigation, hormonal alterations brought on by birth control tablets may encourage HPV persistence and raise the risk that precancerous lesions would develop into aggressive malignancy. It did, however, also note that the risk diminishes once the birth control treatment is discontinued, suggesting that the adverse reactions are not always permanent.

Similar verdicts were obtained by Appleby et al. (2021), who examined data from more than 24,000 women in 12 different nations. The results showed that the menace of CC was doubled for women who had been using oral contraceptives for over ten years as opposed to those who hadn't previously utilized them. The benefits of OCPs, such as their ability to reduce the likelihood of ovarian and endometrial malignancies and prevent unwanted pregnancies, ought to be carefully balanced against any potential hazards, the investigators stressed. This emphasizes how important comprehensive counseling is when advising long-term usage of contraceptives.

Additional investigations have looked at the relationship between HIV, long-term birth control pill use, and the risk of CC. According to an investigation by Chersich et al. (2020), women with HIV who had been on OCPs for a long time had the highest risk of getting CC. According to the results, immunodeficiency and hormonal factors may work together to hasten cervical anomalies linked to HPV. This emphasizes how crucial it is for women at high risk to have regular cervical screenings and to think about using alternative forms of birth control.

In addition, investigations conducted in LMICs have brought attention to the uneven incidence of cervical carcinoma in women with weakened immune systems. Despite their increased susceptibility, only 32% of HIV-positive women had received CC screening, according to an investigation done in Uganda by Nakalembe et al. (2021). The poor utilization of screenings was ascribed by the investigators to a number of issues, including societal stigma, insufficient awareness, and difficulties in obtaining medical care. Similarly, despite having a far higher risk of CC, HIV-positive women living in the rural regions of Kenya had lower rates of screening than those living in urban areas, according to studies conducted by Gichangi et al. (2018).

Furthermore, recent investigations indicate that environmental and lifestyle factors may change the relationship between birth control pill use, suppression of immunity, and the risk of CC. Contributing variables like tobacco use, inadequate nutrition, and concomitant STIs might exacerbate the effects of immunodeficiency and hasten the development of CC, according to a research investigation conducted by Waggoner et al. (2022). These results highlight the need for an all-encompassing preventative approach that successfully reduces risk factors by combining the HPV vaccine, routine screenings, lifestyle modifications, and customized contraception counseling.

2.3. Socio-economic factors.

2.3.1. Income and employment status.

Studies show that women who are well educated and are working belong to higher socioeconomic status. Such women have health insurance cover and so they tend to go for screening services or programs, (Ali et al, 2019). According to a Ghanaian investigation steered by Ampofo et al. (2020), women without jobs are less likely than those with jobs to

get screened for CC. In a similar vein, an Ethiopian study found that working women were twice as probable as non-working women to use CC screening programs. This discrepancy was explained by Belay et al. (2020) as a result of working women's improved information availability, increased awareness, and peer pressure to be screened. Additionally, they can now afford medical treatment due to their improved financial situation, which makes women more likely to get screened for CC.

Education has a major impact on the acceptance of CC screening programs, according to an investigation done in Kitui Central, Kenya, by Mwangi et al. (2017). Given that greater academic achievement are associated with greater health consciousness and a preference for preventative treatment, the study highlights the necessity of bolstering programs that support girls' education. Furthermore, because they are better able to pay for CC screening and other medical bills, educated people are more inclined to seek medical treatment.

2.3.2. Education.

While wealthy nations have greater levels of knowledge about CC prevention and early detection measures, nations that are developing still struggle with low awareness. Nearly 70% of women in Texas, USA, were aware of the risk aspects linked with CC, and a sizable percentage actively sought testing facilities for an early diagnosis, according to an investigation by Akinlotan et al. (2017). However, despite the accessibility of information on preventive interventions, the majority of women in Zimbabwe, Sub-Saharan Africa, showed inadequate utilization of screening facilities, highlighting continuing knowledge gaps (Tapera et al., 2019).

According to a 2016 East Africa investigation carried out in Northern Uganda by Mwaka et al., a lack of knowledge about the risk factors and symptoms of CC may be the cause of delayed diagnosis and poor progress. The utilization of CC screening programs is impacted by the fact that approximately 77.2% of study participants have neither formal education nor completed primary school. According to an assessment of CC screening awareness conducted in Ethiopia (Chellapandian et al., 2021), 37% of partakers were unable to classify which women were at risk for the disease, and 35.8% of participants were unaware of its symptoms, indicating a low level of knowledge on CC screening. Most women in Kenya have never heard of CC or the screening services available for it, according to an investigation undertaken by Kangmennaang et al. (2017).

2.3.3. Age.

It is uncommon for people under 20 to be diagnosed with CC. Nonetheless, because women over 20 are more likely to contract the disease, routine screening techniques such as Pap smears, VIA, VIA VILI, and HPV testing are advised for them (Chellapandian et al., 2021). The high incidence of HIV and HPV infections, which increase the disease's burden, makes efforts to prevent CC in Sub-Saharan Africa extremely difficult. According to an investigation done in Mali and Senegal by Haque et al. (2020), the increased incidence of CC among females aged 15–24 is largely caused by sociocultural norms such as polygamous marriages, early sexual engagement, and adolescent pregnancies. Additionally, because the disease has not yet been widely acknowledged as a serious public health concern, the lack of defined health policies targeted at reducing it has hampered efforts to eradicate it.

2.4. Socio-cultural factors.

According to studies carried out by Ampofo et al. (2020), socioeconomic variables like high-risk sexual behaviors and unprotected sexual activity are closely associated with the high prevalence of CC in SSA. In the absence of effective detection methods, these variables aid in the spread of sexually transmitted illnesses, such as HPV and HIV/AIDS. Investigation conducted in Botswana among women of reproductive age highlights prevalent misunderstandings surrounding CC screening services, along with concerns about result confidentiality. According to Major et al. (2018), many women hesitate to undergo screening due to fears of being coerced into undergoing a hysterectomy if signs of CC are detected. Additionally, cultural beliefs and misconceptions act as significant deterrents, preventing women from seeking screening services despite having some level of awareness and knowledge about CC.

Kibicho (2013) performed an investigation in Embu, Kenya, which highlights how cultural views affect the adoption of CC screening. According to their investigation, many women choose not to get screened because of deeply ingrained cultural customs, social stigmas, and religious beliefs that forbid disclosing private body parts to medical professionals. Many people think that their private spaces should only be accessible to their spouse or intimate partner. Adoption of CC screening services is further hampered by sentiments of embarrassment and discomfort related to the screening procedure.

2.5. Health facility-related factors.

According to a Malaysian investigation steered by Yong et al. (2018), the use of CC screening services is greatly impacted by unresolved hurdles associated with health facilities. The investigation highlights several major challenges, such as a lack of medical staff and

resources, long wait times for screening services, inadequate documentation, irregular patient follow-ups, and a lack of information, education, and communication (IEC) materials in medical facilities. To improve service acceptance, the research suggests implementing sustainable screening implementation strategies that target these systemic healthcare issues.

According to an investigation by Maseko et al. (2015), there are differences in the distribution of qualified medical professionals for CC services among Malawi's hospitals. Additionally, the study shows that healthcare professionals do not receive enough supervisory support, which has an impact on service delivery. The investigation also highlights insufficient funding for the health sector, which leads to issues like supply shortages and irregular availability of critical medical resources in Malawian hospitals.

The lack of qualified medical staff in healthcare institutions is a significant barrier to CC screening. The number of gynecologists, oncologists, and qualified nurses needed for detection and follow-up care is lacking in many low- and middle-income countries (LMICs). According to an investigation by Mungo et al. (2021), there are extended wait times for examinations and therapies in a number of African nations due to an overworked healthcare workforce. Women who seek these services sometimes have long wait times, which deters them from coming back for more appointments. This difficulty can be lessened by improving medical training programs for professionals and integrating CC screening into standard fundamental medical care.

An investigation by Mugassa and Frumence (2020) in Tanzania, East Africa, indicates that government resource allocation and strategic planning prioritize curative services over preventive measures. The research further underscores that the reliance of developing nations on donor funding affects the sustainability of CC screening programs. Additionally, the

investigation identifies gaps in the transmission of health-related information from national to local government levels, hindering efficient implementation. The shortage of trained healthcare professionals at lower-level health facilities exacerbates the burden on national hospitals. Lastly, the investigation reveals widespread dissatisfaction regarding inadequate awareness campaigns directed at the target population.

An investigation conducted by Mbaka et al. (2018) at Mama Lucy Kibaki Hospital in Kenya revealed that a positive demeanor among healthcare providers serves as a key motivational element, encouraging 82% of participants to consider CC screening. This, in turn, contributes to a higher rate of service utilization. The characteristics of healthcare facilities significantly influence the uptake of CC screening and HPV immunization services. Elements such as service availability, accessibility, affordability, and the standard of care greatly affect women's willingness to seek preventive healthcare. When medical institutions are well-equipped and properly staffed, women are more probable to engross in preventive measures, thereby lowering CC prevalence. However, obstacles such as extended waiting periods, a lack of diagnostic tools, and unsatisfactory experiences with medical personnel discourage many from undergoing screenings. Tackling these challenges can boost service utilization, promoting early identification and prompt treatment of CC.

The lack of qualified medical staff in healthcare institutions is a significant barrier to CC screening. The number of gynecologists, oncologists, and qualified nurses needed for detection and follow-up care is lacking in many low- and middle-income countries (LMICs). According to an investigation by Mungo et al. (2021), there are extended wait times for examinations and therapies in a number of African nations due to an overworked healthcare workforce. Women who seek these services sometimes have long wait times, which deters

them from coming back for more appointments. This difficulty can be lessened by improving healthcare training programs for professionals and integrating CC screening into standard fundamental medical care.

An essential factor influencing participation in screening is the availability of diagnostic resources and laboratory capabilities. In numerous remote and underprivileged areas, healthcare facilities frequently lack critical equipment for conducting Pap tests, HPV diagnostics, and visual inspection using acetic acid (VIA). An investigation by Nakalembe et al. (2020) in Uganda revealed that merely 35% of public medical centers were sufficiently equipped for CC screening. As a result, women were redirected to distant hospitals, leading to heightened travel expenses and reduced follow-up adherence. Strengthening laboratory infrastructure and ensuring a reliable supply of screening tools can substantially improve access to CC detection services.

The financial burden associated with screening and treatment remains a significant obstacle to CC prevention services. Although some governments and organizations provide free or subsidized screenings, many women still face indirect expenses, including transportation, lost income, and costs related to follow-up care. An investigation by Chidyaonga-Maseko et al. (2021) in Malawi revealed that financial limitations were a primary reason women avoided screening services. To address this issue, policymakers should consider solutions such as mobile health clinics, community-driven healthcare programs, and collaborations between public and private sectors to ensure affordable or no-cost screening and treatment options.

The approach and interactions of medical personnel play a pivotal role in determining women's readiness to seek CC services. Studies reveal that unpleasant experiences with

healthcare workers—such as unprofessionalism, lack of discretion, and indifferent attitudes—discourage women from undergoing screenings. Research by Fadeyi et al. (2022) in Nigeria found that women who were treated with dignity and compassion during their initial screening were more likely to return for subsequent check-ups. Educating healthcare providers on patient-focused care, cultural awareness, and effective interpersonal skills can help establish a more inclusive and encouraging atmosphere, thereby boosting participation in screening programs.

An essential aspect influencing CC prevention is the incorporation of screening services into primary healthcare frameworks. In numerous nations, CC screening is not routinely included in reproductive health services, requiring women to seek these screenings independently. This separation leads to missed opportunities, particularly for women attending healthcare facilities for maternal or child health services. An investigation by Campos et al. (2020) in Brazil revealed that integrating CC screening into maternal health programs boosted screening participation by 45%. To enhance accessibility, governments should prioritize embedding CC screening within routine healthcare visits.

Insufficient awareness and inadequate education within healthcare institutions also play a role in the low uptake of CC screening. A significant number of women remain uninformed about the necessity of screening or the availability of such services at medical centers. Research by Gichangi et al. (2021) in Kenya indicated that over 40% of women who had never undergone screening were unaware of where to access these services. To address this gap, healthcare facilities should emphasize patient education by launching awareness initiatives, distributing informative materials, and offering counseling sessions to ensure women comprehend the importance of screening and HPV immunization.

Extended waiting periods and inflexible clinic hours serve as significant deterrents for women seeking CC screening. Numerous healthcare centers operate strictly within standard business hours, posing challenges for employed women who may struggle to attend screenings without disrupting their work schedules. Research conducted by Msyamboza et al. (2021) in Malawi revealed that participation rates surged when screening services were made available during evenings and weekends. To enhance accessibility, healthcare facilities should implement more adaptable scheduling options that cater to women with diverse occupational and familial commitments.

2.6. HPV and cervical cancer.

The Human Papillomavirus (HPV), the most prevalent virus in the reproductive system, is responsible for more than 95% of cases of cervical malignancy (CDC, 2021). Both men and women who engage in sexual activity are more likely to get HPV at some time in their lives, and some people get infected repeatedly. Even though the majority of infected individuals are able to remove the virus, cervical cancer remains the most prevalent HPV-related illness. A sizable portion of female cervical carcinoma occurrences are caused by persistent HPV infections (CDC, 2021).

Most HPV infections go away on their own, and many precancerous growths go away on their own. All women are still at risk, nevertheless, of developing aggressive cancer of the cervix as a result of an ongoing HPV infection. It usually takes 15 to 20 years for cervical carcinoma to develop in those with strong immune systems. On the other hand, the progression can happen in as little as 5 to 10 years in women with compromised immunity, such as those with an untreated HIV infection (CDC, 2021). A thorough, multidisciplinary strategy including education in the community, social advocacy, vaccination, routine

screening, prompt treatment, and palliative care is necessary for the effective prevention of cervical carcinoma.

High-risk variants of the HPV, or human papillomavirus, such as HPV-16 and HPV-18, are the source of continuing infection in more than 95% of cervical gland cancer cases. Although most HPV infections are temporary and are eliminated by the body's immune response in one to two years, a tiny minority of women have persistent infections, which can lead to precancerous changes and, ultimately, invasive cervical carcinoma. According to investigations conducted by Plummer et al. (2021), women who have had persistent high-risk HPV infections are more than 500 times more probable to acquire cervical carcinoma than women who have not been exposed to HPV. This emphasizes how urgently proactive identification and prompt preventive actions through thorough screening and immunization campaigns are needed.

Multiple studies have highlighted the differing rates at which HPV-induced cervical abnormalities progress, influenced by factors such as immunodeficiency, tobacco use, and having multiple sexual partners. Muñoz et al. (2020) reported that individuals living with HIV experience a significantly accelerated transition from HPV infection to cervical malignancy due to compromised immune defense mechanisms. Their research revealed that while HPV infections typically take 10 to 20 years to culminate in cervical cancer among immunocompetent individuals, HIV-positive women may develop the disease within just 5 to 10 years. These verdicts emphasize the necessity of more frequent CC screenings and prompt therapeutic interventions for high-risk groups, particularly those with HIV/AIDS.

Co-infection with other sexually transmitted illnesses can increase the risk of malignant transformation, making it a critical factor in the progression of HPV-related cancers of the cervical region. According to Bruni et al. (2021), those who had both HPV and Chlamydia

trachomatis infections were much more likely to develop severe cervical intraepithelial (CIN 2/3). Similarly, Ghosh et al. (2020) found that Trichomonas vaginalis, herpes simplex virus (HSV-2), and bacterial vaginosis all create a chronic inflammatory environment in the cervix, which promotes HPV retention and increases the likelihood of cellular alterations. These outcomes highlight the importance of comprehensive STI prevention and intervention methods in reducing the menace of cervical cancer.

In addition to co-infections, exposure to pollutants and lifestyle decisions have a big impact on how HPV-related cervical carcinoma develops. For example, smoking has been found to be a significant risk aspect, increasing the incidence of cancer of the cervix in women with HPV. According to Castle et al. (2020), tobacco smoke carcinogens build up in cervical mucus, causing genetic changes that increase cervical cells' susceptibility to HPV-induced cancer. According to their research, active smokers were twice as probable as non-smokers to get CC. Furthermore, an extended HPV infection and a higher risk of cancer of the cervical cavity progression have been linked to poor nutritional intake, particularly deficits in vitamins A, C, and E (McCullough et al., 2021).

Recent investigations suggest that a person's susceptibility to infection with HPV and the development of CC are influenced by their genetic makeup. Certain human leukocyte antigen (HLA) variants are linked with an augmented risk of chronic HPV infections and cervical carcinoma, according to an investigation by Gao et al. (2021) that looked at genetic differences in immune system reaction genes. These results imply that even after being exposed to HPV, some women may have a hereditary predisposition to cervical cancer. Finding these hereditary risk factors may open the door to tailored screening and focused preventative measures for high-risk individuals.

One important area of research is the socioeconomic component of HPV and cervical tumor susceptibility. When it comes to accessing cervical carcinoma preventive services like HPV vaccination and screening programs, women from rural and economically poor regions often face significant barriers. Gichangi et al. (2022) found that women living in rural areas of Kenya had lower rates of HPV vaccination and Pap smear screening because of limited access to medical care, ingrained cultural beliefs, and pervasive misinformation. These results highlight the urgent need for specialized public health campaigns that attempt to close knowledge gaps and debunk myths about HPV and cervical carcinoma prevention.

Initiatives for HPV vaccination have become an essential preventive measure since CC remains a major worldwide well-being concern. The World Health Organisation (WHO) recommends that 90% of girls be fully immunized by the age of 15 to significantly lessen the prevalence of cervical carcinoma globally. However, there are still gaps in vaccination coverage, especially in nations with low and middle incomes. Drolet et al. (2021) steered a thorough worldwide review and found that whereas high-income nations report HPV vaccination rates of over 80%, coverage is still around 30% in many parts of Africa and South Asia. Improving vaccination prices and accessibility in these underprivileged communities is essential to achieving WHO's goals for the eradication of cancer of the cervix worldwide.

2.7 HPV Vaccination.

HPV types 16 and 18 are responsible for almost 70% of instances of CC, and the WHO has approved four vaccines that specifically target these strains. Additionally, five extra oncogenic HPV strains—which account for 20% of CC—are protected against by the 9-valent vaccination. Additionally, two of these vaccinations provide defense against HPV types 6 and 11, which are the main culprits behind anogenital warts. According to

investigations from after-market surveillance and clinical studies, HPV vaccines are safe and very efficient at preventing metastatic cervical cancer, high-grade precancerous tumors, and infections with HPV (Niu et al., 2022).

When administered before HPV exposure, HPV vaccinations provide the best protection. The World Health Organisation (WHO) therefore recommends that females get the vaccine between the ages of 9 and 14, when the majority have not yet had sex. In Kenya, girls between the ages of 10 and 14 receive the HPV immunization from the Ministry of Health (MOH, 2019). Some countries have extended their HPV vaccination programs to include boys because it also helps reduce HPV-associated malignancies in men. Detection for cancer of the cervix is still necessary even after HPV vaccination. To successfully lower the incidence and mortality rates of cervical carcinoma as well as guarantee the early identification and management of precancerous lesions, nations that have implemented HPV vaccination also carry out systematic, population-based screening programs.

The rollout of the HPV vaccine has revolutionized strategies for cervical cancer prevention. This immunization demonstrates remarkable efficacy in shielding against high-risk HPV variants, notably HPV-16 and HPV-18, which are implicated in nearly 70% of cervical malignancies worldwide. Findings by Harper et al. (2021) indicate that countries with extensive HPV immunization initiatives have witnessed a significant downturn in HPV infections and precancerous cervical anomalies. Their research uncovered that regions with substantial vaccine coverage recorded a 67% decline in HPV infections among adolescent females and a 50% drop in cervical precancerous changes in young women. These results highlight the vaccine's crucial contribution to mitigating cervical cancer rates when administered at a formative age.

Despite widespread recognition of the HPV vaccine's efficacy, differences in vaccination rates still exist, particularly in low- and middle-income (LMIC) nations. Investigation by Drolet et al. (2021) suggests that while countries with high incomes have attained HPV vaccination coverage of over 80%, LMICs report much lower rates, typically below 30%. This disparity is caused by a number of things, including poor infrastructure for healthcare, low awareness among the population, cultural misconceptions, and worries about the safety of vaccines. For instance, an investigation conducted in Kenya by Gichangi et al. (2022) found that parental reluctance was caused by false information implying that the vaccine would promote early sexual behavior or result in infertility. Improving vaccine acceptance and uptake requires addressing these myths via focused health awareness initiatives and community engagement.

To maximize its preventive effects, the HPV vaccine is best administered between the ages of 9 and 14—ideally before any encounter with the virus. The World Health Organisation (WHO) highlights that more than 90% of cases of cervical carcinoma associated with HPV can be avoided by vaccinating females before exposure to the virus. Furthermore, realizing that boys can act as HPV carriers and transmitters, some countries have expanded their vaccination programs to include them. Penile, anal, and oropharyngeal cancers are among the various tumors that have been connected to the virus. According to an investigation by Petrosky et al. (2020), immunizing boys not only protects them from these malignancies but also increases herd immunity, which considerably lowers the population's overall HPV transmission.

One of the primary barriers to the HPV vaccine's widespread use, predominantly in countries with low or middle-incomes (LMICs), is its high cost. Many of these countries rely on donor-funded programs like the Vaccine Alliance and Gavi to supply free or heavily discounted

vaccines. Gallagher et al.'s research from 2022, however, raises questions about the initiatives' financial viability because funding shortages could jeopardize the provision of vaccines in the long run. Even though some governments have included HPV vaccination in regular immunization programs, issues like insufficient storage facilities, transportation bottlenecks, and a lack of training for healthcare workers still make it difficult to apply the vaccine effectively. Strengthening healthcare infrastructure and establishing long-term funding sources are crucial for ensuring accessibility.

The public's perception and level of trust in vaccines have a big impact on HPV vaccine adoption. Vaccine hesitancy, which is fuelled by false information and cultural beliefs, continues to be a significant problem in many areas. According to studies steered by Bruni et al. (2021), the main causes of vaccination refusal are safety worries and side effect apprehension. Furthermore, HPV vaccination is occasionally linked to conversations about sexual behavior in conservative settings, which makes parents reluctant to vaccinate their children. Targeted health education initiatives and proactive collaboration with religious and community leaders are necessary to remove these obstacles, build trust, and increase vaccine acceptance.

The global disruption of routine immunization programs caused by the COVID-19 epidemic presented a serious obstacle to HPV vaccination attempts. Vaccine coverage decreased as a result of lockdowns, strains on the healthcare system, and changing public health objectives. According to a UNICEF analysis from 2022, global HPV vaccination rates fell by 5% between 2019 and 2021, undoing earlier advances. Recovery plans should place a high priority on community outreach programs, catch-up vaccination campaigns, and strengthening primary healthcare infrastructure to overcome this setback and guarantee that teenage females who missed their doses receive enough protection.

The HPV vaccine's durability of protection has been the subject of recent studies. Studies conducted over an extended period show that immunity remains effective for at least 10 to 15 years. According to Basu et al. (2021), even ten years after vaccination, vaccinated people continued to have strong immune responses against HPV. Improved protection against cervical cancer and other HPV-associated diseases is also provided by more recent vaccinations, such as the nine-valent HPV vaccine, which includes additional HPV strains like HPV-31, HPV-33, HPV-45, HPV-52, and HPV-58. These developments demonstrate how important HPV vaccination is to all-encompassing cancer prevention initiatives.

2.8 Stages of cervical cancer.

Following a cancer diagnosis, additional examinations are conducted to categorize the disease into different stages. This classification is essential as it helps in formulating an appropriate treatment strategy (National Cervical Cancer Coalition, 2022). As per the National Cervical Cancer Coalition, the following tests may be performed to assess the extent of cancer progression:

a) **Cystoscopy or Proctoscopy:** These procedures assess whether the cancer has spread to the urethra or bladder by visually examining the interior of these organs.

b) **Computed Tomography (CT) Scan:** This imaging method creates finely detailed three-dimensional pictures of interior structures, such as blood arteries and different tissue types, by combining numerous X-rays.

c) **Magnetic Resonance Imaging (MRI):** Utilizing magnets and radio waves, MRI produces high-resolution three-dimensional images of the body. It is also useful in distinguishing between benign and malignant tumors.

d) **Positron Emission Tomography (PET) Scan:** By identifying metabolic activity, a PET scan assesses the function of organs and tissues. To draw attention to regions of aberrant cellular activity, a small quantity of radioactive substance is applied.

CC is divided into major phases by the International Federation of Gynaecology and Obstetrics (FIGO) according to the tumor's growth and dissemination;-

Stage 0 (Carcinoma in situ): Presence of abnormal cells confined to the innermost cervical lining.

Stage I: Cancer is invasive but remains strictly localized to the cervix.

Stage II: Although the cancer spreads outside the uterus, it does not reach the bottom third within the vaginal channel or the pelvic sidewall.

Stage III: The bottom portion of the vagina or the pelvic walls has been affected by cancer. Additionally, it blocks the ureters, which results in renal dysfunction or hydronephrosis.

Stage IV: The cancer advances beyond the true pelvis, affecting the mucosal lining of the bladder or rectum.

Subclassification Based on FIGO Staging:

- **Stage Ia:** Early invasive carcinoma detectable only through microscopic examination.
- **Stage Ib:** A clinically visible tumor confined to the cervix.
    - **Stage Ib1:** Tumor diameter ≤ 4.0 cm.
    - **Stage Ib2:** Tumor diameter > 4.0 cm.
- **Stage IIa:** Cancer has reached the upper two-thirds of the vaginal canal but has not invaded the parametrium.
- **Stage IIb:** Cancer extends into the parametrium without reaching the pelvic sidewall.

- **Stage IIIa:** Without affecting the pelvic sidewall, the cancer has migrated to the bottom portion of the vaginal canal.
- **Stage IIIb:** The malignancy reaches the pelvic sidewall and/or affects the ureter, leading to hydronephrosis or kidney dysfunction.
- **Stage IVa:** Tumor infiltration into the bladder or rectal mucosa.
- **Stage IVb:** Cancer has metastasized beyond the true pelvis, spreading to distant organs.

2.8 Screening methods for cervical cancer.

Kenya screening program commends the following CC detection methods (MOH,2018):

1. The recommended primary diagnostic method for women 30 years of age and older is HPV screening.
2. A visual examination with Acetic Acid (VIA) or an amalgam of VIA and Lugol's Iodine (VIA/VILI) is advised as the primary screening method in situations where HPV testing is not accessible or where following up with patients presents difficulties.
3. In the following situations, the Pap smear is recommended as the primary screening method:
    a) For women who are not eligible for VIA or VIA/VILI because of an obscured squamous-columnar junction (SCJ), and in situations where HPV testing is not available.
    b) As the first screening technique for women under thirty.
    c) As an additional test for HIV-positive women in addition to HPV screening, if the required resources are available.

To detect precancerous alterations and tumors, cervical carcinoma screening involves evaluating HPV infections and taking appropriate action. Unnoticed women who could otherwise feel perfectly well are the focus of this examination. The risk of developing cancer progression is greatly decreased by early diagnosis of HPV infections or precancerous abnormalities, which enables rapid treatment. Furthermore, screening makes it easier to detect cancer of the cervical cavity in its early stages, when treatment options have a far greater chance of curing the disease completely.

The general female populace should begin cervical carcinoma screening at age 30, with follow-up evaluations with an approved HPV test every five to ten years. On the other hand, women who have been confirmed to have HIV ought to begin testing at age 25 and have more frequent examinations, roughly every three to five years. When a medical professional performs the cervical specimen collection method, it is consistent for both cytological testing and HPV diagnoses. Additionally, the World Health Organisation (WHO) recommends self-collected specimens for HPV DNA screening, but not for HPV mRNA testing.

The age of 30 should be the starting point for the detection of cancer of the cervix in the general female population, with follow-up screenings using a validated HPV test every 5 to 10 years. However, screening should start earlier, at age 25, and be done more regularly, every three to five years, for women who are HIV positive. When a medical professional performs cytology and HPV testing, the procedure for acquiring a cervical sample is the same. Furthermore, while HPV mRNA testing is exempt from this recommendation, the World Health Organisation (WHO) advises using self-collected specimens for HPV DNA testing. For women to gain confidence in handling the screening procedure, they need sufficient support. For individuals who test positive, it is imperative to make sure that testing services are smoothly combined with management and follow-up care. Women who test

positive for HPV may be treated without additional diagnostic testing in settings with low resources. An extra triage test, like Visual Inspection with Acetic Acid (VIA), is required to determine the best course of treatment for women with HIV. The Ministry of Health (MoH) in Kenya recommends that women between the ages of 21 and 49 have CC screenings, usually three times a year, using the VIA or Pap smear test (MoH, 2019).

2.9 Theoretical framework.

The Health Belief Model (HBM) served as the theoretical foundation for this investigation, which looked at the variables affecting reproductive-age women with HIV/AIDS's use of cancer of the cervix detection services. The HBM was first created in the 1950s to explain why people do not take part in early detection or illness prevention programs (LaMorte, 2019). In addition to providing a framework for illness prevention, the model is a forecasting tool for health behaviors. It suggests that perceived vulnerability, perceived danger, perceived advantages, cues to take action, and feelings of self-worth all affect a person's health-related behavior (Rural Health Information Hub, 2002). To prevent negative health outcomes, the HBM urges people to adopt proactive health behaviors by emphasizing the possible risks of inaction (Amanullah & Uddin, 2008).

Despite its widespread use in health research, the Health Belief Model (HBM) has a number of drawbacks that researchers have noted. One of its main flaws is that it ignores societal norms, environmental factors, and financial limitations in addition to human attitudes and dispositions to adopt healthy behaviors. Furthermore, the model makes the assumption that everyone has an equal opportunity to obtain wellbeing information and makes logical, impartial judgments about their health (Norman & Conner, 2017). The HBM is used in this

research to investigate the behavioral factors affecting the use of cancer of the cervix screening services.

The Health Belief Model (HBM) has been extensively used during investigations on preventing cervical cancer to investigate the social and psychological elements that influence behaviors linked to health. It sheds light on why certain women enthusiastically participate in screening and immunization programs while others are more cautious. The paradigm states that a mix of individual beliefs, societal dynamics, and structural barriers affect health behaviors. Public health experts and academics can create focused interventions that support cancer of the cervix prevention and early detection by utilizing this approach.

A person's perception of their risk of acquiring cervix cancer is known as reported susceptibility, and it is one of the most important elements of the HBM. Prophylactic measures, such as routine screening or HPV vaccination, are more likely to be used by women who believe they are at high risk for the illness. However, research indicates that many women underestimated their risk, especially in low-resource environments where there is a lack of awareness of CC. The need for focused awareness campaigns that highlight individual risk factors like HPV infection, having several partners, and a history of infections that are sexually transmitted is highlighted by research by Kahesa et al. (2020), which found that women with low perceptions of vulnerability were less prospective to take part in prevention initiatives.

Because it indicates a person's understanding of the grave repercussions of cancer of the cervix, such as its effects on overall wellness, fertility, and financial well-being, perceived severity is a crucial factor in determining preventative health behaviors. According to research, women are more prospective to seek screening and immunization if they recognize the serious consequences of cervical cancer. Women who have experienced cervical

cancer—either through family members or friends—were more likely to see the disease as life-threatening and, as a result, adopt preventive measures, according to a research investigation conducted by Mbachu et al. (2021). However, due to a lack of knowledge or firsthand experiences with the ailment, the severity of cancer of the cervix is sometimes understated in some communities, which lessens the urgency of prophylaxis.

A key component of the Health Belief Model is the idea of perceived benefits, which emphasises a person's faith in the efficacy of preventative measures. Women are more likely to embrace routine Pap screening examinations and HPV vaccination if they understand the preventative benefits of these procedures. However, hesitation is frequently exacerbated by false information about the vaccine, such as worries about infertility or the idea that it is only required for women who are sexually active. Giving women thorough and accurate information on the HPV vaccine greatly increased adoption rates, according to an investigation by Ncube et al. (2020). Similarly, women were more inclined to get screened if they knew that Pap smears could identify precancerous alterations before symptoms appeared.

Women may understand the advantages of preventative care, but a number of obstacles may prevent them from taking advantage of it. These barriers could be structural, psychological, cultural, or pecuniary. Access to screening services is restricted by financial difficulties, especially in low-income areas. Routine screenings are discouraged in rural locations due to the high expense of transportation and the long commutes to medical facilities. Women are further discouraged by cultural norms and the stigma associated with cervical cancer testing, since some are afraid of social rejection. Many women skipped screening because they were afraid of pain, embarrassment, or the fear of getting a positive diagnosis, according to Ndikom and Ofi (2019). Participation rates can be significantly increased by overcoming

these obstacles through mobile healthcare services, culturally appropriate health education, and subsidised screening programs.

External factors known as cues to action can upset a woman's decision to be vaccinated or have a cancer of the cervixs screening. Media awareness efforts, advice from medical professionals, community-based initiatives for outreach, or firsthand experiences with the illness are a few examples of these triggers. Studies demonstrate how important doctors are in influencing women's health decisions. Fadeyi et al. (2021) found that women who had strong medical recommendations were far more probable to get screened for CC than those who did not follow their advise. Participation in the community, such as women's health organisations, also acts as a strong motivation by promoting peer support and knowledge sharing, which further promotes preventative health practices.

Self-efficacy, or a woman's belief in her capacity to take preventive action, is another essential element of the Health Belief Model (HBM). Women who believe they have control over their well-being are more likely to take preventative measures like getting vaccinated and screening for cervical carcinoma. But low self-efficacy, which is sometimes brought on by a lack of education, a fear of medical operations, or a patriarchal society's reliance on male authority figures, might deter people from obtaining health care. According to research, women who have received more education and have had more encounters with medical knowledge are more confident in their ability to make knowledgeable healthcare decisions. Self-efficacy can be raised by putting in place health programs that emphasise counseling, education, and awareness. This will ultimately encourage more people to engage in preventative medical practices.

Critical insights into improving intervention tactics have been provided by the application of the Health Belief Model (HBM) in CC prevention. It is possible to greatly increase

engagement with screening and immunisation programs by tailoring health messaging to target important elements of the model, such as raising awareness of susceptibility, emphasising the seriousness of the disease, emphasising the advantages of screening, and lowering obstacles. Initiatives that combine mobile outreach efforts, community-based education, and active participation from healthcare practitioners have been shown to be quite successful in increasing engagement. These tactics should be incorporated into national fight against cancer of the cervix initiatives by governments and healthcare organisations in order to improve health outcomes. A strong framework for understanding the behavioural factors impacting efforts to prevent cancer of the cervix is offered by the HBM.

2.10 Conceptual framework.

The outcome variable in this investigation was the utilization of cervical cancer screening services, including VIA/VILI, HPV tests, and Pap smears. It was hypothesized that the independent variables, categorized into patient-related aspects and health facility-related factors, would influence the uptake of these screening services. Socio-economic factors such as income, education, marital status, and age were expected to affect the use of these services, alongside socio-cultural factors including religion, cultural beliefs, and ethnicity. The study also evaluated the relationship between health facility-related factors, such as healthcare provider attitude, availability of screening equipment, workload, waiting time, and the uptake of detection services. Furthermore, the influence of government policies and healthcare guidelines on the interaction between the independent and dependent variables was considered in the analysis.

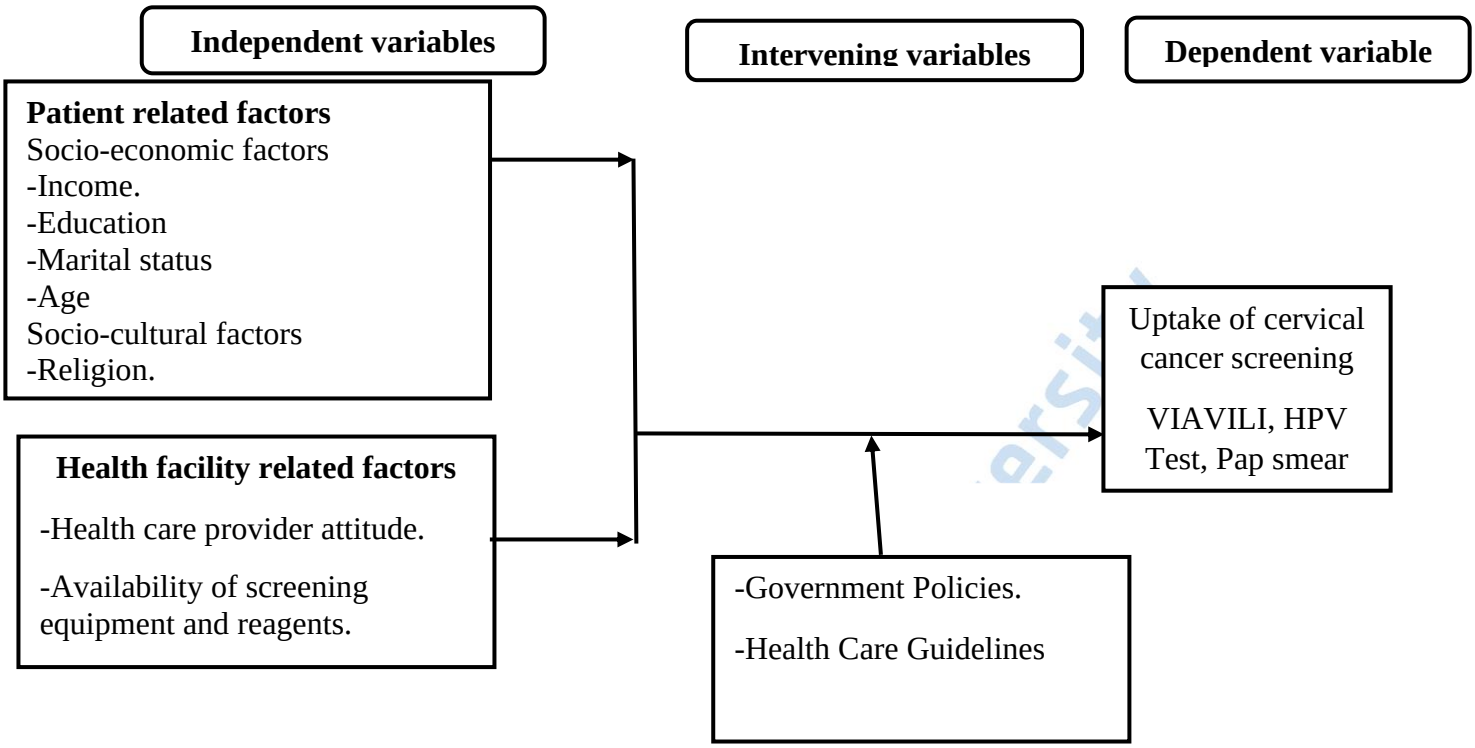

Figure 1:Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction.

The study approach employed for the investigation is described in this chapter. The target population, sampling strategy, gathering data methods, and analytical techniques used for interpreting the findings are all included.

3.2. Study design.

To investigate the factors affecting the use of screening services for cancer of the cervix among HIV-positive WRA at NCTRH, Kenya, a cross-sectional analytical research design was employed. A mixed method of gathering data was used. A data abstraction tool was used to extract cancer of the cervix detection status and technique information from laboratory and Comprehensive Care Clinic (CCC) patient records. Structured surveys were used to gather quantitative insights, while in-depth key informant interviews were used to gather data that was qualitative. The CCC lead clinician, nurses doing cervical carcinoma screenings, and compliance counselors were the primary informants.

3.3. Target population.

The whole group of interest in an investigation is referred to as the target population. The investigation in this instance concentrated on HIV/AIDS-positive WRA (15–49 years) who were undergoing treatment at the NCTRH CCC.

3.3.1 Inclusion and Exclusion criteria.

Women with HIV/AIDS of reproductive age (18–49 years) who were enrolled in the NCTRH CCC and gave their informed permission were enrolled in the investigation. On the other hand, those who refused to participate had mental health issues or were very sick were not allowed to take part in the investigation.

3.4 Sampling Technique.

NCTRH was deliberately chosen as the study site due to its role as the primary referral hospital in Nakuru County, serving a vast population. Its central location within the town ensures accessibility for residents both within the county and from neighboring regions. Additionally, the facility provides various cervical cancer screening methods, including VIA-VILI, HPV testing, and Pap smear.

Subjects were chosen using a systematic random selection technique. In accordance with Mugenda's (2008) criteria, this procedure entailed selecting individuals directly from the sample frame, which was received from the CCC and sequentially organized. From the list of the daily CCC visits, nth value was calculated based on the daily number to be interviewed. The first participant was randomly selected, and thereafter every nth patient was sampled.

Each respondent in this investigation was given a number identification, which helped to methodically arrange the sample frame. Daily sampling from people who visited the CCC was part of the selection procedure, which had a target sample size of 384. Half (20) of the 40 women who visited each day were systematically selected by choosing every second participant, beginning at random. The formula K = N/n (384/20 = 20) was used to get the sample interval (K). To obtain a sufficient sample size, gathering data was spread out across 20 days.

Key informant interview participants were purposively selected was the health care service providers at the hospital specifically those working at the CCC department.

3.5 Sample Size

Statistical validity was ensured by using Cochran's method (1977) to calculate the size of the sample for an infinite population. $n0 = Z^2PQ / e^2$

Whereby

P= variability or Proportion equal to 50%

Z= is the statistic with a z value of 1.96 that corresponds to the chosen degree of confidence, in this instance 95%.

e= level of precision (0.05)

q= 1-p

So

$n0 = (1.96^2 \times 0.5 \times 0.5) / 0.05^2 = 384.16$

= 384 study participants

3.6 Data collection instruments

Both open-ended and closed-ended questions from a structured questionnaire were used to gather data that is quantitative. A timetable for interviews was also used to make data collecting easier. A consent form had to be signed by participants before they could begin answering the questionnaire or answering the interview schedule. Selected investigation subjects participated in key informant interviews to gather data that was qualitative. The CCC in charge, physicians, nurses, adherence counselors, and other pertinent healthcare professionals who may offer helpful insight were among the experts at NCTRH whose detailed insights were gathered using a key informant interview guide.

3.7 Validity and reliability of research instruments

A pilot investigation was steered to guarantee the precision and dependability of the data-gathering instrument. The pre-test included thirty-eight individuals in total, which accounted for 10% of the sample. Subjects were chosen at random for the pilot research, which was conducted at Kisumu's Jaramogi Oginga Odinga Teaching & Referral Hospital. The data-gathering tool was improved based on the pre-test results to guarantee that it recorded correct

and pertinent data. Using SPSS, the Cronbach's alpha coefficient was calculated to estimate internal consistency in the pre-test questionnaires. The tool's consistency and appropriateness for the primary investigation were validated by reliability criteria of 70% and higher.

3.8 Data Processing and Analysis.

To make sure all questions on the survey were addressed, the gathered data was carefully examined. Questionnaires that were blank or poorly completed were deemed void. Tables, pie charts, and graphs were used in the display of data to improve the explanation and comprehension of the investigation's results. The analysis of data was done using both qualitative and quantitative methodologies. Before being transferred to the Statistical Package for the Social Sciences (SPSS) version 25 for analysis, quantitative data was first put into an Excel sheet for editing, cleaning, and validation to find discrepancies abnormalities, and missing variables. The mean, mode, and percentages of descriptive statistics were calculated. While logistic regression analysis was used to identify relationship patterns using odds ratios, inferential analysis was performed using Chi-Square tests to investigate associations. After undergoing thematic analysis, the qualitative data was organized into sub-themes.

3.9 Ethical consideration

The Institutional Scientific, Research Ethics, and Review Committee (ISREC) of Mount Kenya University granted me ethical permission for my work. NACOSTI provided authorisation for the investigation, and the appropriate county government agency obtained authorisation to perform the investigation in the chosen location. Every responder was asked for their informed written agreement while taking part was completely optional. Subjects were free to leave the research at any time without facing any repercussions. Each responder

was given a unique identification number on the questionnaire rather than their name, ensuring that confidentiality and privacy were rigorously maintained. Every participant completed a permission form attesting to their desire to participate after receiving a comprehensive explanation of the study's importance and goal prior to gathering data.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This section is focused on examining and interpreting the data gathered during the research. It outlines the key results, discusses their significance, and frequently includes charts, tables, or other visual aids to better illustrate the outcomes.

4.2 Questionnaire Response Rate

This refers to the proportion of individuals who participated in the investigation out of the total number that were contacted or eligible to take part. It serves as an indicator of the research's effectiveness in obtaining responses from the target population. In this investigation, all 384 participants contacted took part, resulting in a 100% response rate.

Table 1:Questionnaire Response Rate

	Valid	**Percentage**
Valid	384	100
Not valid	0	0
Total	**384**	**100**

4.2 Socio-demographic and economic factors

Table 2: socio-demographic characteristics

Category	Frequency	Percentage
Age		
18 - 24	25	6.5
25 - 30	29	7.6
31 - 35	40	10.4
36 - 40	81	21.1
41 - 45	98	25.5
46 - 50	111	28.9
Marital Status		
Single	91	23.7
Married	175	45.6
Divorced/Separated	75	19.5
Widowed	43	11.2
Education		
None	19	4.9
Primary (not completed)	44	11.5
Primary (completed)	86	22.4
Secondary (not completed)	37	9.6
Secondary (completed)	101	26.3
Tertiary/college/university	97	25.3
Occupation		
None	33	8.6
Farmer	40	10.4
Business	153	39.8
Formal employment	68	17.7
Casual worker	77	20.1
Others	12	3.1
Household income		
Below ksh 10,000	49	12.8
10,000 - 30,000	134	34.9
31,000 - 50,000	117	30.5
> 50,000	44	11.5
No Income	10.4	40
Parity		
0	44	11.5
1-3	260	67.7
> 3	80	20.8
Religion		
Christian	311	81.0
Muslim	22	5.7
Traditionist	6	1.6
No religion	45	11.7

Distance to the clinic		
< 1 km	218	56.8
> 1 km	166	43.2
Time since diagnosis		
1 year and below	33	8.6
2-5 yrs	70	18.2
6-10 yrs	116	30.2
11-15yrs	98	25.5
16-20yrs	67	17.4
time since ART initiation		
1 year and below	33	8.6
2-5yrs	74	19.3
6-10 yrs	139	36.2
11-15yrs	91	23.7
16-20yrs	47	12.2
WHO HIV staging		
Stage 1	218	56.8
Stage 2	72	18.8
Stage 3	67	17.4
Stage 4	27	7.0

Table 2 shows the Socio-demographic and economic characteristics of the investigation respondents. Regarding age 28.9%(n=111) were aged between 46 -50 years, 25.5%(n=98) were aged between 41- 45 years, 21.1% (n=81) were aged between 36 -40 years, 10.4%(n=40) were aged between 31-35 years, 7.6%(n=29)were aged between 25 -30 years, and 6.5%(n=25) were aged between 18-24 years. The marital status of the women revealed that the majority were married, 45.6%, single women were 23.7%, women who were divorced or separated were 19.5%, and 11.2% of the women were widowed. In regard to educational background of the patients, 26.3% (n=101) had completed secondary education while 9.6% had not completed secondary education. 22.4% had completed up to primary education while 11.5%(n=44) had not completed primary education. Women who attained university or college or tertiary education level were 25.3%(n=97), while those who never attended any school were 4.9%(19).

The occupational status of the women indicated that the majority(39.8%) were business personnel, 20.1% were engaged in casual work formal employment was represented by 17.7% had formal employment, 10.4% were doing farming, while 11.7%(n=45) were not doing anything or were involved in other forms of occupation.

On net household income, the majority (40%) reported that their households had no income, 34.9 %(n=134) had income between kshs. 10,000 -Kshs. 30,000, 30.5% had a household income between Kshs. 30,000 and 50,000. 12.8% had an income below Ksh 10,000 while 11.5% had income above Ksh 50,000. Regarding religion, the majority (81%) were Christians, Muslims were 5.7%, and traditionalists were 1.6%, while 11.7% were not affiliated with any religion. The majority (56.8%) were living less than one kilometer from the health facility while 43.2% were outside the one-kilometer proximity to the hospital.

Regarding the duration Since diagnosis with HIV, the majority(30.2%) reported between 6 to 10 years, 25.5% reported 11 to 15 years 18.2% took 2 to 5 years since diagnosis while 17.4% reported a period of 16 to 20 years since diagnosis. While the minority took one year and below since diagnosis with HIV. Thirty-six point two(36.2%) of the women took 6 to 10 years after initiation of ART, 23.7% took 11 to 15 years, 19.3% took 2 to 5 years, 12.2% took 16 to 20 years while 8.6% were one year and below since the initiation of ART. According to WHO HIV staging, the majority of the women enrolled into CCC while at stage 1 of HIV, 56.8%, while only 7% enrolled CCC when at stage 4 of HIV.

4.3 Uptake of Cervical Cancer Screening

TABLE 3 Uptake of Cervical Cancer Screening

Category	Frequency	Percentage
Screened for Cancer		
Yes	303	78.9
No	81	21.1
Method used for screening		
VIA/VILI	303	78.9
Pap Smear	61	16.0
HPV	19	5.0
Colposcopy	1	0.01
Symptoms		
Yes	20	5.2
No	283	73.7
Motivation to screening		
Routine checkup	85	22.1
advise by healthcare worker	217	56.5
results of the screening		
positive/suspicious	4	1.0
negative	298	77.6
rescreening done for -ve results		
Yes	247	64.3
No	50	13.0
Reasons for not being screened		
fear of procedure	75	19.5
fear of results	5	1.3
test is embarrassing	1	.3

The results in Table 3 showed cervical cancer screening status as self-reported by the participants. The findings indicated that the majority of the women, 78.1%, have ever been screened for CC while 21.1% were not screened at all. Of the proportion of those who were screened, the majority used the VIA/VILI method of screening because it was free and affordable, 16% used the Pap smear method, 5% used the HPV screening method and 0.01% used the colposcopy screening method. Most women who screened for CC reported having no symptoms of CC, 73.7% while 5.2% did have symptoms of CC. There must have been motivation to screening for cervical cancer and the majority reported to have been advised by a healthcare worker to undergo the screening test, 56.5% while 22.1% were doing screening as a routine checkup. The results of the screenings done were mostly negative, 77.6% while only a few reported finding positive results, 1%. Once the results turned positive, advisably majority of the respondents, 64.3% underwent rescreening while 13.0% did not go for rescreening according to their report. Women who did not go for screening alluded to fear of the screening procedure as the most common reason, 19.5%, fear of knowing the results, 1.3%, and that the test is embarrassing, 0.3%.

4.4 factors associated with Uptake of Cervical cancer screening

4.4.1 Soci-demographic and Socio-economic factors Associated with Upatke of Cervical Cancer Screening

TABLE 4 Association Between Sociodemographic Factors And Uptake Of Cancer Screening Services

Sociodemographic factor	Chi-square	P-value
Age	90.295	0.000
Marital Status	23.146	0.000
Education	6.837	0.033
Occupation	30.234	0.000
Distance to clinic	1.584	0.208
Religion	17.067	0.001
Parity	51.069	0.000

The findings revealed a statistically significant correlation between several socio-demographic aspects and the utilization of CC services. These factors included age (p=0.000), marital status (p=0.000), education (p=0.033), occupation (p=0.000), religion (p=0.001), and parity (p=0.000), all of which had p-values less than 0.05. On the other hand, distance to the clinic (p=0.208) was not significantly correlated with the utilization of cancer detection services, as its p-value was greater than 0.05.

4.4.2 Patient-related factors associated with uptake of cervical cancer screening

4 Knowledge on Cervical cancer and screening

TABLE 5: Knowledge of cancer and screening

Category	Frequency	Level of knowledge	Percentage
Heard of cervical cancer			
Yes	381	High	99.2
No	3	Low	.8
Source of information			
health facility	220		57.3
Friends	25		6.5
Church	20		5.2
Barraza	4		1.0
Media	108		28.1
Others	4		1.0
Higher risk of cervical cancer			
Yes	162	High	42.2
No	95	Low	24.7
Don't know	127	Moderate	33.1
Heard of cervical cancer screening			
Yes	372	High	96.9
No	12	Low	3.1
Sexually transmitted			
Yes	200	High	52.1
No	63	Low	16.4
Don't know	121	Moderate	31.5
cervical cancer caused by HPV			
Yes	224	High	58.3
No	35	Low	9.1
Don't know	125	Moderate	32.6
Menstrual bleeding is heavier & longer			
Yes	226	High	58.9
No	18	Low	4.7
Don't know	140	Moderate	36.5
Persistent abd. pains a sign of cervical cancer			
Yes	215	High	56.0
No	28	Low	7.3
Don't know	141	Moderate	36.7
Pain during sexual intercourse a sign			

Yes	201	High	52.3
No	13	Low	3.4
Don't know	170	Moderate	44.3
Vaginal discharge			
Yes	191	High	49.7
No	45	Low	11.7
Don't know	148	Moderate	38.5
Multiple sex partners increase risk			
Yes	310	High	80.7
No	16	Low	4.2
Don't know	58	Moderate	15.1
HIV increase risk			
Yes	312	High	81.3
No	40	Low	10.4
Don't know	32	Moderate	8.3
Women should be screened.			
Yes	8	Low	2.1
No	364	High	94.8
Don't know	12	Moderate	3.1

The Investigation results presented in Table 5 reveal that an overwhelming 99.2% of the participants had heard of CC. The majority (57.3%) reported learning about cervical cancer from health facilities, while 28.1% obtained this information through media outlets. Other sources included friends (6.5%, n=25), the church (5.2%, n=20), and community gatherings (1.0%, n=4). A significant proportion (96.9%) of the subjects were aware of CC screening. Furthermore, the investigation showed that more than half (52.1%) of the participants agreed that CC is sexually spread, and a majority (58.3%) believed it is caused by HPV. Additionally, 58.9% of the participants stated that menstrual bleeding becomes heavier and longer during the infection. The investigation also highlighted that 80.7% of the participants acknowledged that having several sexual partners and HIV increases the risk of CC. Moreover, 94.8% disagreed with the notion that women should only be screened for CC

when symptoms appear, advocating instead for regular screenings. These findings indicate that the participants possess a high level of knowledge about CC.

4.5 Relationship between knowledge of cancer screening and cervical cancer screening

TABLE 6 :Chi-square association between knowledge and cervical cancer screening

Association with cancer screening	Chi-square value	P-value
Heard of cervical cancer	11.311**	0.001
Higher risk of cervical cancer	52.124**	0.000
Heard of cervical cancer screening	37.066**	0.000
Sexually transmitted	3.320	0.190
Cervical cancer caused by HPV	0.329	0.848
Menstrual bleeding is heavier & longer	2.720	0.257
Persistent abdominal pains a sign of cervical cancer	10.179**	0.006
Pain during sexual intercourse a sign	7.873**	0.020
Vaginal discharge	18.590**	0.000
Multiple sex partners increase risk	8.762**	0.013
HIV increase risk	6.472**	0.039
Women should be screened	10.589**	0.005

*** Significant Chi-quare values at 0.05 level of significance.*

The investigation results indicate a chi-square association between knowledge-related factors and the uptake of CC screening. Variables that were found to be statistically significant, with p-values less than 0.05, included: having heard of CC (p=0.001), recognizing a higher risk of cervical cancer (p=0.000), awareness of CC screening (p=0.000), perceiving persistent abdominal pain as a sign of cervical cancer (p=0.006), believing that pain during sexual intercourse signals cervical cancer (p=0.020), noticing vaginal discharge (p=0.000), recognizing that having multiple sex partners increases the risk (p=0.013), acknowledging that HIV increases the risk (p=0.039), and the belief that women should undergo screening

(p=0.005). However, the knowledge that CC is sexually transmitted (p=0.190), caused by HPV (p=0.848), and that menstrual bleeding is heavier and thicker with cervical cancer (p=0.257) were not statistically significant, as their p-values were greater than 0.05.

TABLE 7: Linear Regression between knowledge of cancer screening and cancer screening status

Overall Significance		
Pearson R	0.525	
F-statistic	14.176	
P-value	0.000	
Individual Significance		
Higher risk of cervical cancer	0.801	0.424
Heard of cervical cancer screening	10.014	0.000
sexually transmitted	-0.087	0.931
Persistent abd. pains a sign of cervical cancer	-0.295	0.768
Pain during sexual intercourse a sign	1.208	0.228
vag. bleeding/douching/pelvic examination	-0.875	0.382
Vaginal discharge	-0.495	0.621
Multiple sex partners increase risk	0.155	0.877
HIV increase risk	3.214	0.001
Women should be screened	-0.012	0.990
Higher risk of cervical cancer	0.801	0.424
Heard of cervical cancer screening	10.014	0.000
sexually transmitted	-0.087	0.931

The findings in Table 7 show a strong and positive correlation between knowledge about cancer and the status of CC screening, with an R-value of 0.525. Furthermore, the knowledge of cancer significantly affects CC screening status, as shown by a p-value of 0.000. This advocates that a higher level of understanding about cervical cancer plays a crucial role in influencing participants' decisions regarding screening. Additionally, individual factors such as the source of information, awareness of CC, and the perceived risk of developing the disease were found to significantly impact the screening status. Moreover, factors like menstrual bleeding, vaginal bleeding, or the need for a pelvic examination also contribute to determining the participants' CC screening status, with p-values indicating statistical significance ($p < 0.05$).

4.6 Health Facility related factors

TABLE 8:Health Facility Factors

Category	Frequency	Percentage
cancer test is expensive		
Yes	8	2.1
No	358	93.2
Don't know	18	4.7
Health workers attitude is bad		
Yes	39	10.2
No	338	88.0
Don't know	7	1.8
Health facility is far		
Yes	8	2.1
No	371	96.6
Don't know	5	1.3
Screening/waiting time is long		
Yes	63	16.4
No	306	79.7
Don't know	15	3.9
Lacks screening equipment		
Yes	66	17.2
No	293	76.3
Don't know	25	6.5
Missed screening services		
Yes	277	72.1
No	104	27.1
Don't know	3	0.8
Screening services offered different days		
Yes	9	2.3
No	367	95.6
Don't know	8	2.1
Waiting time for screening test		
Less than 20 min	112	29.2
20 to 40 minutes	175	45.6
41 minutes to 1 hour	43	11.2
1 hour to 2 hours	41	10.7
More than 2 hours	13	3.4

According to the information in Table 8, a sizable percentage of participants (93.2%) believe cervical cancer screening is affordable, whereas a much smaller percentage (2.1%) think it is expensive. Furthermore, 4.7% of those surveyed had no idea how much the screening would cost. Regarding the attitude of healthcare staff, the majority of participants (88.0%) said that they typically had a good attitude. Conversely, 1.2% of respondents were unsure about the demeanor of healthcare staff, and 10.2% of respondents believed that the personnel had a bad attitude.

The majority of the participants responded that the healthcare facility was not far from their residence, (96.6%), some (2.1%) agreed that the healthcare facility was far from their place of residence, while the minority were unsure (1.3%) the distance of healthcare from their residence. Screening waiting time was not long according to the majority of the participants, (79.7%), some agreed that the waiting time was long (16.4%), and while (3.9%) didn't know of the waiting period length.

According to most participants (76.3%), health facilities have screening equipment, (17.2%) agree that health facilities lack screening equipment, while (6.5%) have no idea.

The majority (72.1%) have missed CC screening services, (27.1%) have not missed CC screening services, and (0.8%) have no idea. Services were always offered on normal days according to most participants (95.6%), some participants agreed that screening services were offered on different days, (2.3%), and (2.1%) didn't know. The majority of participants (45.6%) reported waiting time for the patients for screening of 20 to 40 minutes, while slightly below half reported waiting for less than 20 minutes. A smaller portion (11.2%) reported having waited between 41 minutes to 1 hour, while (10.7%) reported to have waited between 1- 2 hours. Participants who waited for more than 2 hours were the minority, (3.4%).

TABLE 9: Association between health-related factors and cancer screening uptake

Association with cancer screening	Chi-square	p-value
Cancer test is expensive	72.101	0.000
Health workers attitude	28.594	0.000
Health facility is far	19.071	0.000
Screening/waiting time is long	80.483	0.000
Lacks screening equipment	96.455	0.000
Missed screening services	18.170	0.000
Screening days different	32.651	0.000
Waiting time for screening test	51.322	0.000

According to the table's outcomes of the study, there was a statistically significant correlation ($p=0.000 < 0.05$) between the uptake of cancer screening and all health-related characteristics.

4.7 Relationship between health-related factors and cervical cancer screening

TABLE 10: Linear Regression between health-related factors and cervical cancer screening

Overall Significance		
Pearson R	0.320	
F-statistic	5.358	
P-value	0.000	
Individual Significance		
C. cancer test is expensive	3.027	0.003
Health workers attitude is bad	-1.193	0.233
Health facility is far	-0.673	0.501
Screening/waiting time is long	1.032	0.303
lacks screening equipment	0.968	0.334
Missed screening services	3.355	0.001

Screening services offered different days	1.034	0.302
Waiting time for screening test	2.299	0.022

With p-values <0.05, the investigation showed a strong relationship between health-related characteristics and CC screening. In particular, the use of CC screening services was substantially correlated with variables such as test waiting times, missed screening appointments, and screening test costs. The p-values being less than 0.05 showed that these factors had an impact on whether patients sought screening services.

4.8 Discussion

The investigation found that 78% of women with HIV/AIDS who were of reproductive age had taken part in CC screening, which is a high uptake rate of 78.9%. This increased use rate might be ascribed to targeted campaigns of outreach and better access to medical care for this susceptible population. For women with HIV/AIDS, improved cancer treatment results can result from early discovery through higher screening rates. Conversely, Yimer et al. (2021) found that CC screening rates in SSA were only 12.87%, which is far lower than the results of the present investigation. According to an investigation conducted in Meru South, Tharaka Nithi, 50% of women aged 51 to 60 have been examined, compared to just 12.5% of women aged 21 to 30. Although women between the ages of 31 and 40 had a greater utilization rate in the present investigation (Willy & Obuya, 2021), the percentage of participants in this investigation was higher than the findings in Meru South.

One important aspect affecting the use of detection services was the participants' level of awareness about CC and screening. Women were more probable to seek screening if they were aware of risk aspects, understood the tests that were offered, and knew that they were

accessible. Age, education, and understanding were found to be important variables in increasing CC screening. Although screening uptake was strongly correlated with age, these patterns were also influenced by other factors such as information availability, personal health views, and healthcare access. These results contrast with those in Machakos County, where 42% of people used CC screening services (Mitheu & Mutuku, 2022).

The distance to medical facilities, women's educational attainment, and recommendations from healthcare providers were some of the factors that led to the rise in the usage of CC screening. Because it helps to normalize and explain the process, women who are well-informed on the risks of CC, the value of a prompt diagnosis, and the screening process itself are more willing to participate. Low adoption of CC screening has been seen in underdeveloped countries, despite its shown advantages in lowering incidence and death. In contrast to the results of this investigation, for instance, only 3% of Ghanaian women underwent screening with VIA or Pap tests (Ampofo et al., 2020; Devarapalli et al., 2018).

The use of CC detection services by women living with HIV is greatly influenced by demographic characteristics, which can either help or hinder access to these vital medical treatments. When it comes to screenings, younger women could behave differently than older women. While older women are more inclined to understand their growing susceptibility and the significance of routine tests, younger women may feel less at risk for some malignancies. Women from lower socioeconomic backgrounds may find it difficult to attend screening visits due to obstacles like insufficient insurance coverage, transportation problems, and trouble getting time off work. Women from higher socioeconomic backgrounds, on the other hand, usually have easier access to medical care and are more aware of screening recommendations.

Women with advanced educational qualifications are typically more knowledgeable about the relevance of cancer screenings and are more ready to act on health-related data. According to the survey, a significant percentage of participants had obtained a significant degree of education, with the majority of the women having finished at least secondary school or higher education (25 and 26 percent, respectively). A greater understanding of cancer risks and the importance of routine screenings is closely associated with higher levels of education. People's decisions to seek preventative medical care are influenced by their increased health literacy, which is brought about by education. These findings support a study carried out in Northwest Ethiopia (Aynalem et al., 2020), which found that women with greater levels of schooling were more probable than those without formal education to screen for CC. Women who had completed secondary school were also more probable than those who had not been screened for cancer. Additional evidence for this trend comes from research done in Ethiopia and Kenya.

Women who are better educated are more probable to participate in cancer screenings for cervical cancer because they are more able to be exposed to information about cervical carcinoma and how to prevent it. Important elements that affect screening rates include the accessibility of medical facilities, the availability of specialised treatments, and robust healthcare support networks. Women who are part of a backed up care network or who regularly have access to a medical professional are more likely to participate in screenings. To upsurge screening involvement among women living with HIV and improve overall health outcomes, it is imperative to address these sociodemographic factors through community outreach initiatives, educational campaigns, and making medical care easily available. The results of the present investigation are consistent with those of Willy and Obuya's (2021) Tharaka Nithi investigation, which found that knowledge, education, and age

were important factors in determining the utilization of CC screening. The findings of this investigation were further supported by an investigation carried out in Machakos (Mitheu & Mutuku, 2022), which also found characteristics including age, marriage status, educational level, and place of residence to be significant in the use of CC screening.

Women who have received education may also be more equipped to handle healthcare systems. One reason for this could be that women are more probable to use CC screening services as they become older because they are exposed to more information about the disease and how to get screened for it. Another theory is that women may contact with medical facilities more frequently as they age and face more health concerns, which may drive them to use screening services. Furthermore, women with more education typically have higher level of health literacy, which enables them to make more educated choices regarding their health and comprehend the need of cancer screening.

Women with greater levels of education typically have easier access to detrimental to health knowledge and resources, which helps them comprehend the benefits of cancer detection and the range of available screening programs. A proactive approach to obtaining cancer screenings and making sure they receive prompt and appropriate medical treatment is more likely to result in these women feeling empowered to take responsibility for their personal medical needs. Higher educated people are also frequently better off monetarily, which lessens the possibility of financial barriers related to the price of medical services, such as screenings. Women with more education also often have better communication skills, which improves their relationships with medical providers and encourages candid conversations about the need of cancer screenings. This probably makes them more inclined to follow advised screening protocols.

In essence, higher educational levels among women with HIV positively impact their likelihood of utilizing cancer screening services by fostering health literacy, improving access to vital information, enhancing personal empowerment, providing financial stability, and fostering trust in healthcare providers. These factors together promote a proactive healthcare mindset, which increases the chances of engaging in regular cancer screening.

In this investigation, One important predictor of CC screening participation was marital status. Research revealed that married women were 45 percent more probable to participate in programs to detect CC than their peers who were widowed, divorced, or single. This outcome aligns with the findings of a comparable study conducted in Thailand. One possible reason for this outcome is that married women frequently have an existing network of support from their partners, which might encourage and ease the choice to get screened for cancer. Because medical choices are frequently shared in married relationships, there is a greater chance that cancer tests will be prioritized and addressed. The usage of screenings is positively impacted when spouses actively support and keep an eye on their partner's health, including routine examinations and screenings. Married women could also have easier access to pooled funds, which would help control the cost associated with cancer tests. Further lowering obstacles to use, psychological encouragement from a partner can also assist allay worries or anxiety about screenings.

However, women who are single or unmarried may face particular obstacles that prevent them from receiving cancer testing, such as a lack of financial or psychological assistance and restricted access to medical resources. Their capacity or inclination to use screening services may be adversely affected by these obstacles. In general, marital status has a big impact on how often women with HIV use cancer screening because it can affect things like disposable income, emotional support, collaboration in making decisions about health issues,

and access to support networks—all of which influence health behaviours and choices within a relationship.

Women's use of CC screening was found to be significantly predicted by the age at which they first had sex. In contrast to women who started having sexual relations after the age of 16, those who started at age 16 or younger had a higher chance of getting screened for CC. This conclusion might be enlightened by the point that women who start having sex earlier in life may have numerous relationships overall, which raises their chance of catching STIs and STDs. These women are more probable to partake in CC screening if they experience symptoms from these infections, which may prompt them to seek medical attention.

According to this investigation, the usage of cancer detection programs tends to grow with age, indicating that women are more probable to utilise testing services as they age because of the higher risk of CC and the possibility of having had several sexual encounters. One reason for this tendency could be that as women with HIV age, they become more conscious of the dangers to their health and the importance of routine tests. These women may become more proactive regarding handling their general well-being and more concerned about their health as they age, giving cancer tests the most attention.

Additionally, medical care practitioners may be more probable to prescribe cancer testing for older women who have HIV since these women are at a higher risk of developing specific cancers, such as breast or CC, as they age. Additionally, older HIV-positive women are more inclined to have formed connections with medical care professionals and have a longer history of contact with medical personnel. This may lead to routine tests being completed and suggestions being made more frequently. Women with HIV may also become more knowledgeable and conscious of their medical needs as they age, which might improve their

comprehension of the need of cancer screenings and increase their propensity to follow screening guidelines.

In general, a number of variables, including increased awareness of health hazards, established connections with healthcare professionals and collected health knowledge, may be linked with the increasing age of women living with HIV. When taken as a whole, these factors could increase the population's use of cancer screening services. According to the investigation's findings, the most important factor affecting a patient's use of CC screening services was their knowledge about cancer and screening tests. Many women stated that they were aware of the dangers of CC and had learned about it from medical services. They were thus also made aware of the choices for CC screening. Since the VIA/VILI technique of screening was offered at no cost at the medical facility, many women chose to use it.

Women's understanding of the significance of CC screening was a major contributor to the use of these services. The likelihood of screening for CC was higher among individuals who knew more about the disease than among those who didn't. This is consistent with research from Northern Ethiopia, Malawi, Tanzania, and Thailand that found that women are more probable to use screening services when they are aware of the advantages of screening. The investigation found that among WRA living with HIV/AIDS who attended NCTRH, awareness of CC screening significantly influenced the uptake of screening.

HIV-positive women's attitudes, behaviours, and choice to seek screening services are greatly influenced by their knowledge about cancer and screening. Women with HIV can be empowered to take control of their well-being by increasing awareness regarding cancer risks and the importance of early screening. Women might be encouraged to actively seek early diagnosis and preventative screening by learning about the dangers of HIV-related cancer. Furthermore, expanding awareness can aid in debunking myths, lowering stigma, and

removing anxieties that could otherwise deter women from being screened. Women who are more informed are far more inclined to take charge of their health, be proactive, and get frequent checkups.

Women are also more equipped to make knowledgeable decisions about their medical and customize screening options to meet their individual requirements when they are informed about the many screening alternatives, their advantages, and any potential hazards. This makes awareness of CC screening an essential strategy for enhancing wellness and promoting increased use of screening services by HIV/AIDS-positive women.

Among WRA living with HIV/AIDS, the use of cancer testing services was found to be significantly influenced by the distance to medical facilities. Solutions include setting up outreach initiatives to bring screenings closer to the communities, providing telehealth services, and deploying mobile screening units that might be useful in overcoming the difficulties caused by distance. Additionally, lowering the obstacles brought about by distance and enhancing access to cancer screening facilities for this group may be possible by providing financial assistance for travel costs, flexible scheduling alternatives, and education on the need of routine screenings.

With a p-value of less than 0.05, the present investigation found that health-related characteristics, including waiting times for screening, accessibility of testing facilities, and the cost of screening tests, were significant predictors of the use of screening services. Depending on the particular situation, these variables either promoted or discouraged patients from using screening services. Nonetheless, the majority of women gave positive answers, suggesting that the low cost of the screening, the hospital's adequate supply of screening equipment, and the short wait time encouraged patients to take part in screenings. Furthermore, the daily availability of services for screening made it easier for patients to have

tests whenever it was most convenient for them. However, the adoption of CC screening services was not significantly impacted by variables like the attitudes of medical professionals or the distance to the hospital, indicating that these were not significant obstacles. A single investigation in the Asian continent found that a number of factors, including sociodemographic, consciousness, attitude and beliefs, perceived danger, psychological in nature self-efficacy, past history, time, family members, culture, fatalism, societal support, access, price, security, insurance, and medical system-related elements, have a positive impact on CC screening among Asian women (Salehiniya et al, 2021). Women with HIV are more likely to have cervical carcinoma. While fear of prejudice or stigma may discourage some, awareness of this risk may encourage others to seek routine testing. Chronically ill women may prioritize their medical visits above other health problems, which might result in decreased CC screening rates.

However, acknowledging the need for routine screenings can promote long-term involvement in screening initiatives. Regular check-ups are more likely to be maintained by women who have previously had CC screenings. Lack of previous screenings might lead to misunderstandings or lessen the significance of subsequent screenings. A major factor in increasing utilization might be the accessibility of screening alternatives and the simplicity of access to these services (e.g., no referral required). Healthcare institutions that offer centered around community screening programs or reminders might also help to promote consistent participation.

4.9 KII results and discussion

The Key Informant Interview guide was used to obtain qualitative data from the subjects based on the important themes in the investigation.

Table 11: KII themes for qualitative analysis

Factor	Key theme
Opinion on cervical cancer	A huge concern but preventable through regular HPV screenings such as pap smear
Challenges experienced in CC screening uptake for women with HIV/AIDS	Access to healthcare services (stigma, discrimination), health complications.
Benefits of CC screening	Early detection and prevention
Formal training on cervical cancer & HIV/AIDS	YES
Suggested policies	Educational campaigns for awareness, financial assistance programs and integrated healthcare services for CC screening

The insights obtained from the Key Informant Interviews (KII) presented in the table above offer crucial perspectives on the complexities associated with CC and its screening, especially among women living with HIV/AIDS. The KII participants shared their views on various aspects such as the significance of CC, challenges to screening uptake, the advantages of screening, the necessity for formal training on the topic, and recommended policies to improve screening rates. The respondents widely acknowledged CC as a major health threat to women. They pointed out that despite the persistently high incidence of cervical cancer, it is mostly preventable through regular screenings, particularly with Pap smears and HPV tests. The participants highlighted that increasing awareness about the ailment and the importance of preventive measures could greatly reduce the number of CC cases.

These findings are corroborated by prior studies, which indicate that knowledge of CC and continued education of preventative measures are significant indicators of screening uptake. For example, Getachew et al. (2019) discovered that women were more likely to undergo

screening services if they knew about the link between HPV and CC. Similarly, a systematic review by Agide et al. (2018) indicated that educational initiatives focused on the preventability of cervical malignancy led to greater awareness and higher participation in screening programs.

The KII responses also identified several obstacles that prevent women living with HIV/AIDS from undergoing cervical cancer screenings. Perceived health problems and the perceived affordability and accessibility of medical services were identified as the two main obstacles. According to reports on healthcare access, stigma and prejudice against women who live with HIV/AIDS frequently lead to their denial of essential medical treatment. This led to a culture of non-compliance, where affected individuals avoided seeking medical care and consequently missed important screening appointments. This aligns with the results of Holland et al. (2020), who noted that stigma prevents women from accessing medical care, adversely affecting their health.

The KII participants also identified significant benefits of cervical cancer screening. They emphasized two key advantages: early detection and prevention. On early detection, all KII participants acknowledged that screening plays a vital role in identifying CC at an early stage, which improves treatment outcomes. They noted that treatment is usually more effective and less aggressive when CC is detected early. Supporting this, Eun and Perkins (2020) conducted an investigation showing that CC screening significantly enhances early detection and reduces mortality rates from the disease. They argued that regular cervical health check-ups should be prioritized.

Another advantage mentioned by the KII participants was the preventive aspect of cervical malignancy screening. They pointed out that abnormal cells, which could potentially develop into cancer, can be detected early using Pap smears. They highlighted that intervention before

cancer fully develops is possible. This preventive aspect of CC screening is further confirmed by Bedell et al. (2020), who stated that with the proper implementation of such techniques, cervical malignancy incidence could be reduced by more than 80%.

The KII participants also discussed the additional health challenges faced by women living with HIV, who are often diagnosed with other health conditions that can mask cervical health issues. These complications can interfere with routine healthcare and divert attention away from critical screenings. Nkeng et al. (2021) noted that the failure of women living with HIV/AIDS to attend cancer of the cervix detection services hampers effective service delivery.

In line with the insights provided by the Key Informant Interview (KII) participants, all expressed strong support for the implementation of a professional education initiative that focuses on the link between cervical cancer and HIV/AIDS. They noted that increasing awareness among healthcare providers would result in improved screening practices. Participants emphasized that training should specifically cover topics related to cervical health, how HIV influences the risk of cervical malignancy, and the importance of routine screenings. Research by Mutua et al. (2021) demonstrated that the most effective way to enhance healthcare workers' competence and their readiness to advise on CC screenings for women living with HIV was through comprehensive training programs. This underscores the necessity for educational initiatives aimed at healthcare professionals to positively impact patient care.

From the discussions, the Key Informant Interview (KII) participants proposed several policies that could improve cancer of the cervix detection among women living with HIV/AIDS. The most common suggestions included public awareness campaigns, financial support programs, and better coordination of healthcare facilities. Participants highlighted

the lack of comprehensive educational efforts in promoting CC campaigns that should specifically target women with HIV/AIDS, address the stigma surrounding the ailment, and emphasize the significance of timely detection. A similar investigation by Shah et al. (2020) used community-based education to improve cervical cancer screening among marginalized groups.

Participants also pointed out the necessity for subsidies for exams and screening services, particularly for low-income women. Several respondents noted that the cost of screening could be a significant deterrent, which aligns with prior research. For instance, Ojerinde (2023) observed that reducing financial barriers was linked to higher screening rates among vulnerable populations.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This section summarises the investigation's results, makes inferences from the data, and makes suggestions for filling up any gaps or for other research projects.

5.1 Summary of Results

The primary finding of the investigation was that, at a rate of 78.9%, women of reproductive years living with HIV/AIDS were highly likely to use cancer screening programs. The use of CC screening services was shown to be substantially correlated with sociodemographic characteristics, including age, married status, education, employment, religion, and parity. 99.2% of women showed knowledge of CC, which is another noteworthy statistic when it comes to the disease and its dangers. Additionally, there was a statistically significant correlation ($p<0.05$) between the adoption of screening services and awareness about CC screening.

Regarding health-related features, the primary results exhibited that 79.9 percent of the subjects had short wait times for screening, 96.6% said the health facility was reasonably accessible, and 93.2% thought the cost of checking for CC was reasonable. The adoption of CC screening services was shown to be statistically significantly correlated with these health-related characteristics ($p<0.05$). A statistical relationship was found between the likelihood of using cancer detection services and a number of factors, including test cost, healthcare worker attitude, distance to the facility, time spent waiting for screening, availability of screening equipment, missed screening appointments, screening days, and waiting tests.

5.2 Conclusions

With an involvement percentage of 78.9%, WRA living with HIV/AIDS demonstrated a noteworthy and high degree of engagement in cancer detection programs. This result highlights the significance of focused health interventions and access to preventive care for this at-risk population, indicating that increased awareness and support mechanisms played a vital role in motivating these women to undergo essential screenings. Moreover, it suggests

that ongoing efforts in education and the provision of resources could further amplify participation, ultimately enhancing the health outcomes for women existing with HIV/AIDS.

Concerning the awareness of CC, a clear positive correlation was found between an individual's knowledge of the ailment and their participation in screening. Specifically, individuals with a deeper understanding of cancer risks, signs, and the importance of early detection were more probable to engage in CC screening. This finding stresses the crucial role of education and raising awareness in fostering proactive health behaviors, suggesting that boosting knowledge about cervical cancer can substantially increase screening participation and potentially improve health outcomes for individuals at risk.

Health-related factors also proved a significant link with the uptake of CC screening. This underlines the standing of addressing medical care obstacles and emphasizing educational initiatives that raise awareness about CC. Ultimately, this suggests that enhancing access to healthcare and educational efforts could lead to higher screening rates, promoting early detection and better health outcomes for women.

5.3 Recommendations

Given the high rate of use of cancer detection services observed in this investigation, it is recommended that healthcare providers and policymakers strengthen awareness campaigns and improve access to cancer screening programs, particularly for WRA living with HIV/AIDS.

In response to the investigation findings highlighting the influence of health-related factors on CC screening, it is advised that healthcare providers design comprehensive programs that enhance education and raise awareness about cancer of the cervix, emphasizing the significance of routine screening, especially for high-risk populations.

Additionally, collaborating with community leaders and healthcare professionals will help customize educational initiatives that address the unique needs and concerns of various groups, thus motivating more individuals to participate in regular CC screenings and promoting early detection.

Recommendation for future research

Future research should focus on understanding how socio-economic and cultural factors influence knowledge and screening behaviors, along with identifying the challenges and barriers women encounter in accessing screening services.

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APPENDICES

Appendix 1: Questionnaire
Questionnaire Number _____

Date (dd/mm/yyyy/ _____

PATIENT RELATED FACTORS

A. Socio-Demographic and Economic Factors.

1. Age----------

2. What is your marriage status at the moment?

Single [ ] Married [ ]

Divorced/ Separated [ ] Widowed [ ]

3. What is the highest degree of schooling you have earned??

(If you are presently enrolled, indicate the highest grade or degree you have obtained prior to your current enrollment) ---------

None [ ] Primary (not completed) [ ]

Primary Completed [ ] Secondary (not completed)[ ]

Secondary Completed [ ] Tertiary / College/ University University [ ]

2. What is your current occupation?

None [ ] Farmer [ ] Business [ ]

Formal employment [ ] Casual worker [ ]

Others (Specify)…….

5. How much does the whole family make on average each month??

Below Kshs 10,000 [ ]

10,000- 30, 000 [ ]

31,000- 50,000 [ ]

>50,000 [ ]

3. Parity

0 [ ]

1-3 [ ]

>3 [ ]

4. What is your current religion?

   Christian [ ]

   Muslim [ ]

   Traditionalist [ ]

   No religion [ ]

5. Distance from residence to the clinic.

   < I Km [ ]

   >1 Km [ ]

HIV clinical History (To be retrieved from clients' medical records)

Time since HIV diagnosis? ……...Years

Time since initiation of ART?.....Years

WHO HIV staging at the entry to CCC

Stage 1 [ ]

Stage 2 [ ]

Stage 3 [ ]

Stage 4 [ ]

B. Knowledge on Cancer and Screening

"I will ask you some questions about cervical cancer. These questions are used to understand how much you know about cervical cancer." (Read questions to respondent)

6. Have you heard of cervical cancer? [ ] Yes [ ] No

b) If yes, where did you find the info?

Health Facility [ ] Friends [ ] Church [ ] Barraza [ ]

Media [ ] Others specify----------

7. Compared to other women I am at a higher risk of getting cervical cancer?

   Yes [ ] No [ ] Don't know [ ]

8. Have you ever heard of cervical cancer screening?

   [ ] Yes [ ] No

I will ask you some questions about cervical cancer. These questions are used to understand how much you know about cervical cancer			
	Yes	No	Don't Know
CC can be transmitted through sexual contact from one individual to another.			
CC is triggered by the Human Papillomavirus (HPV).			
Abnormal menstrual bleeding, characterized by increased heaviness and duration, could indicate the presence of CC?			
Persistent unexplained lower abdominal pains could be a sign of CC?			
Discomfort or pain during sexual activity may indicate the presence of CC			
Could douching or pelvic inspection, in addition to bleeding from the vagina following sexual activity, be an indication of CC?			
An increase in vaginal discharge may be a potential indicator of CC			
Engaging in sexual activity with multiple partners raises the likelihood of developing CC			
HIV infection heightens the likelihood of developing CC.			
CC screening should only be conducted for women when they show signs or symptoms.			

CERVICAL CANCER SCREENING STATUS (SELF REPORTED)

12. Since enrolling at the clinic, have you ever had a CC screening?

Yes [ ] No [ ]

9. If yes to **Q 12** what method of screening was used? (Review records)

VIA/VILI [ ]

Cervical Cytology/ HPV testing [ ]

Colposcopy [ ]

PAP smear [ ]

10. If Yes to **Q 12** did you have symptoms of cervical cancer?

Yes [ ] No [ ]

11. If Yes to **Q 12**, what motivated you to get screened?

Routine checkup [ ]

Advise by health care worker [ ]

Referral by a CHW [ ] \

Others specify ……

12. If yes to **Q 12**, what was the results of the screening (review records)

Positive/Suspicious [ ]

Negative [ ]

13. If the results were negative was rescreening done?

Yes [ ] No[ ]

14. After a positive result was treatment initiated (check records)

Yes [ ] No [ ]

If NO to **Q 12** What were the reasons you have never been screened?

Fear of procedure----------

Fear of results----------

Test is painful----------

Test is embarrassing----------

It is against my cultural practices and religious beliefs----------

HEALTH FACILITY RELATED FACTORS.

I would like you to answer the following regarding the provision of CC screening at the health facility.

	Yes	**No**	**Don't Know**
CC test is Expensive			
Health workers Attitude is bad			
The Health facility is far			
Screening / Waiting time is too long			
The hospital lacks screening equipment/ reagents			
I have ever missed CC screening services in the clinic			
CC screening services are provided on separate days from the regular clinic visit days.			

15. How long is the waiting time for cervical screening time?

Less than 20 minutes [ ] 20minutes to 40 minutes [ ] 41minutes to 1hour [ ]

1hour to 2hours [ ] More than 2hours [ ]

Appendix 2: Key Informant Interview Guide.

Part I: Socio-demographic data.

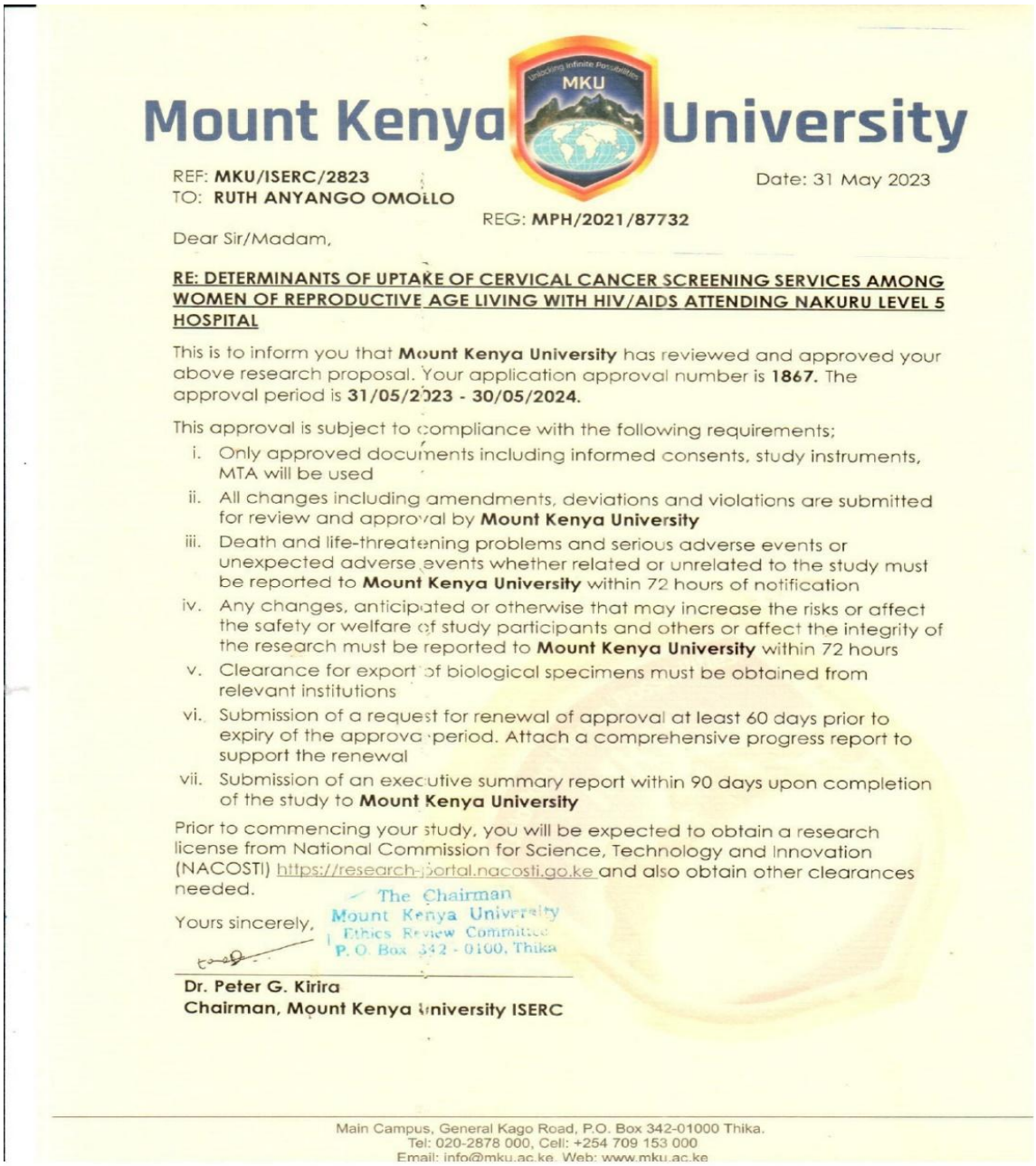
a) Department name…….. section…….
b) Job Tittle……Position……..
c) Level of education…….
d) Age……..

e) Sex: Male/ Female……..
f) How long have you been employed in the medical field?.....

Part II: Knowledge of Cervical cancer screening uptake and Practice

a) How many years have you worked in your field of specialization
b) What is your opinion of CC among women?
c) What is your experience in handling cancer and Hiv/ AIDS patients?
d) What challenges have you had in getting HIV/AIDS women to participate in CC screening?
e) According to your knowledge what are the benefits of CC screening?
f) What is your opinion on CC screening uptake among the women living with HIV/AIDS?
g) Have you had any formal Training on CC and HIV/AIDS?
h) What laws would you recommend be implemented to encourage more women with HIV/AIDS to get screened for CC?

Appendix 3: ERC Certifcate.



Mount Kenya University

REF: **MKU/ISERC/2823**
TO: **RUTH ANYANGO OMOLLO**

Date: 31 May 2023

REG: **MPH/2021/87732**

Dear Sir/Madam,

RE: DETERMINANTS OF UPTAKE OF CERVICAL CANCER SCREENING SERVICES AMONG WOMEN OF REPRODUCTIVE AGE LIVING WITH HIV/AIDS ATTENDING NAKURU LEVEL 5 HOSPITAL

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **1867.** The approval period is **31/05/2023 - 30/05/2024.**

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 **Mount Kenya University**
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 **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** 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 **Mount Kenya University**

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

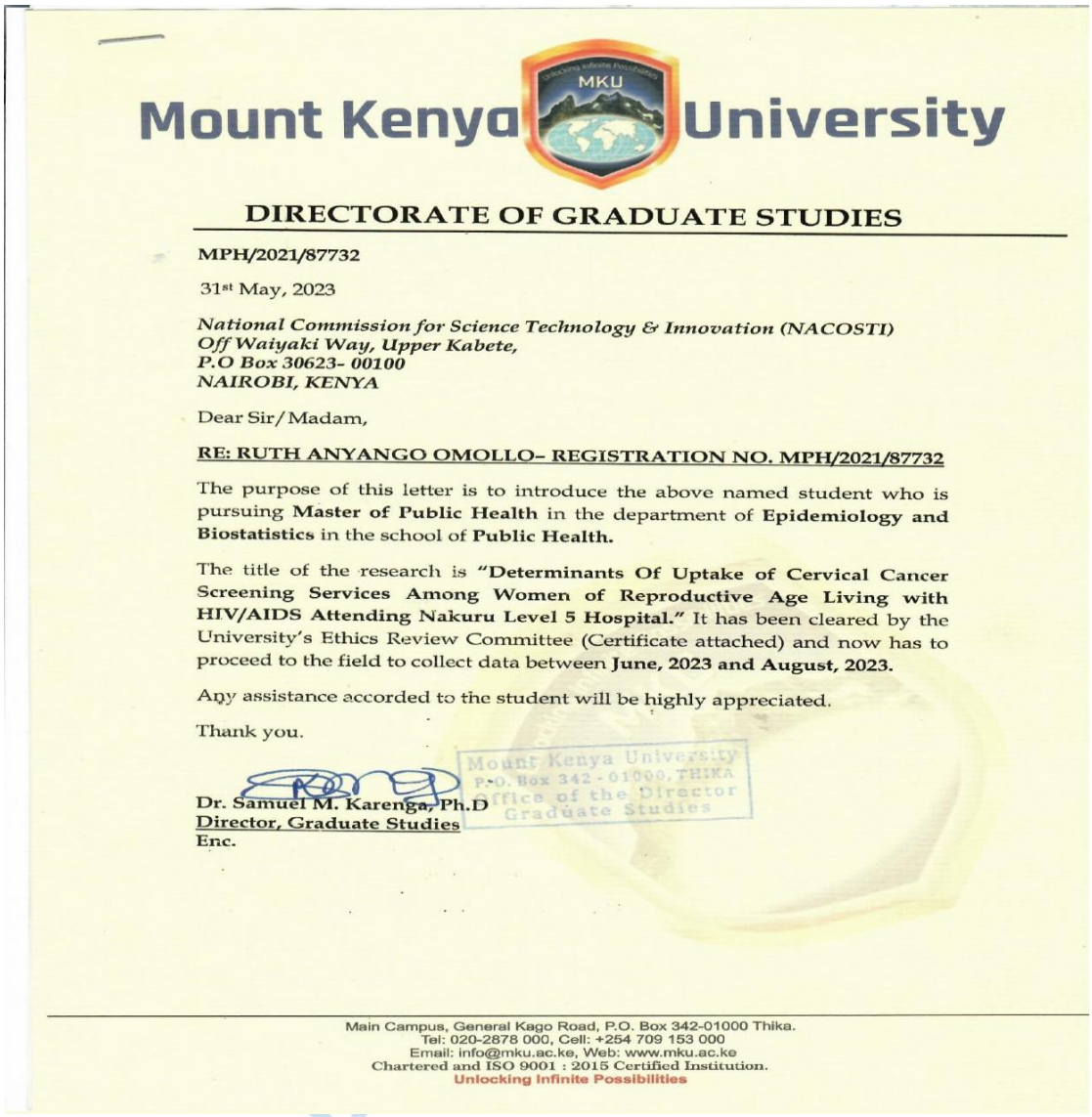
The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Yours sincerely,

Dr. Peter G. Kirira
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: 020-2878 000, Cell: +254 709 153 000
Email: info@mku.ac.ke, Web: www.mku.ac.ke

Appendix 4: Mku Introductory Letter.



Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPH/2021/87732

31st May, 2023

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: RUTH ANYANGO OMOLLO– REGISTRATION NO. MPH/2021/87732

The purpose of this letter is to introduce the above named student who is pursuing **Master of Public Health** in the department of **Epidemiology and Biostatistics** in the school of **Public Health.**

The title of the research is **"Determinants Of Uptake of Cervical Cancer Screening Services Among Women of Reproductive Age Living with HIV/AIDS Attending Nakuru Level 5 Hospital."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **June, 2023 and August, 2023.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342 - 01000, THIKA
Office of the Director
Graduate Studies

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
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Appendix 5:Nacosti Permit.

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **182095**

Date of Issue: **14/July/2023**

RESEARCH LICENSE

This is to Certify that Ms.. Ruth Anyango Omollo of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: DETERMINANTS OF UPTAKE OF CERVICAL CANCER SCREENING SERVICES AMONG WOMEN OF REPRODUCTIVE AGE LIVING WITH HIV/AIDS ATTENDING NAKURU LEVEL 5 HOSPITAL for the period ending : 14/July/2024.

License No: **NACOSTI/P/23/27248**

182095

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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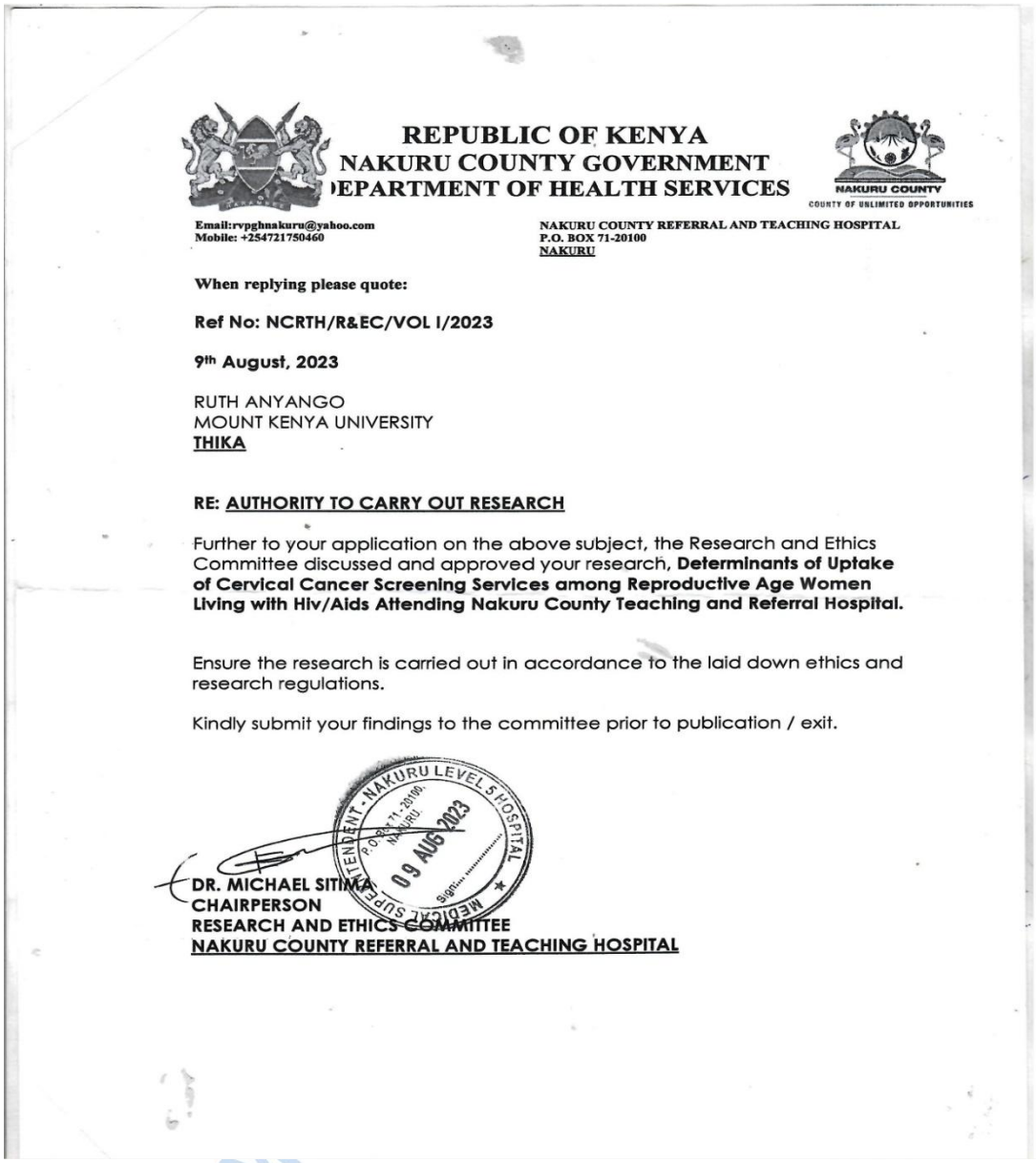
See overleaf for conditions

Appendix 6: Permit for Department of Health.



REPUBLIC OF KENYA
NAKURU COUNTY GOVERNMENT
DEPARTMENT OF HEALTH SERVICES

NAKURU COUNTY
COUNTY OF UNLIMITED OPPORTUNITIES

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Mobile: +254721750460

NAKURU COUNTY REFERRAL AND TEACHING HOSPITAL
P.O. BOX 71-20100
NAKURU

When replying please quote:

Ref No: NCRTH/R&EC/VOL I/2023

9th August, 2023

RUTH ANYANGO
MOUNT KENYA UNIVERSITY
THIKA

RE: AUTHORITY TO CARRY OUT RESEARCH

Further to your application on the above subject, the Research and Ethics Committee discussed and approved your research, **Determinants of Uptake of Cervical Cancer Screening Services among Reproductive Age Women Living with Hiv/Aids Attending Nakuru County Teaching and Referral Hospital.**

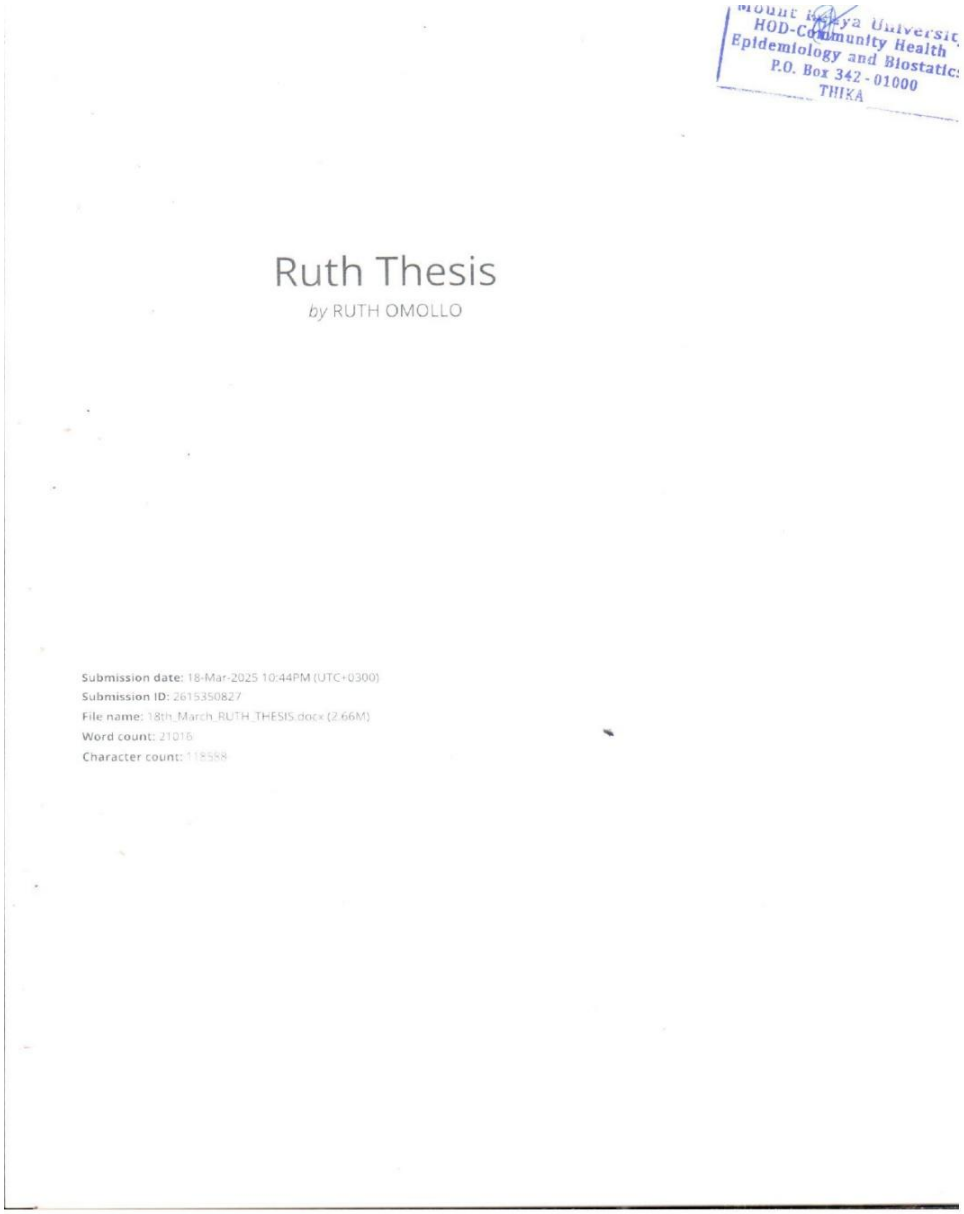
Ensure the research is carried out in accordance to the laid down ethics and research regulations.

Kindly submit your findings to the committee prior to publication / exit.

NAKURU LEVEL 5 HOSPITAL
MEDICAL SUPERINTENDENT
P.O. BOX 71-20100
NAKURU
09 AUG 2023

DR. MICHAEL SITIMA
CHAIRPERSON
RESEARCH AND ETHICS COMMITTEE
NAKURU COUNTY REFERRAL AND TEACHING HOSPITAL

Appendix 7: Similarity Index Report



THIKA

13%	12%	7%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	erepository.uonbi.ac.ke	1%
2	Submitted to Mount Kenya University Student Paper	1%
3	Submitted to University of Sunderland	<1%
4	erepository.mku.ac.ke Internet Source	<1%
5	uir.unisa.ac.za	<1%
6	Submitted to Lira University Student Paper	<1%
7	www.coursehero.com	<1%
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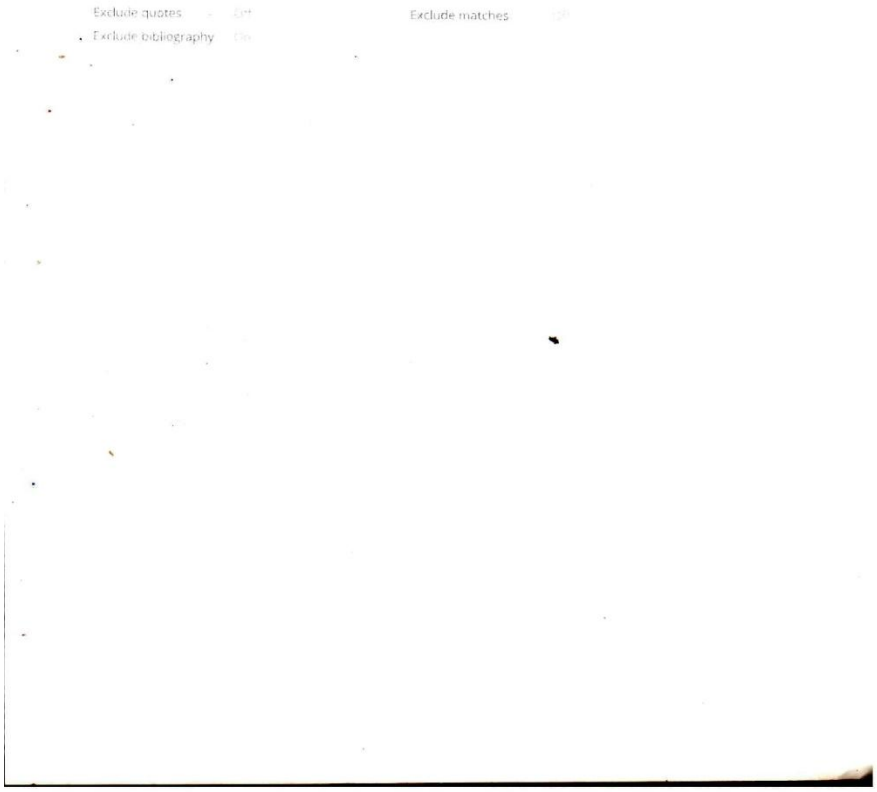
Mengistu Meskele Koyira et al. "Towards 90-70-90 targets: Individual and community level factors associated with cervical cancer screening among women of reproductive age in Tanzania: A multi-level analysis based on 2022 Tanzania demographic and health survey", PLOS ONE, 2024

Publication



Appendix 8: Map of the Study Area