INTEGRATING UPTAKE OF CERVICAL CANCER SCREENING AWARENESS CREATION IN COMMUNITY HEALTH STRATEGY IN KAKAMEGA COUNTY, KENYA

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DECLARATION

This Thesis is my original work prepared with no other than the indicated sources and support and has not been presented elsewhere for a degree or any other award.

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DEDICATION

Special dedication to my family for the remarkable and wonderful support throughout this journey.

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ABSTRACT

Cervical cancer (CC) is the second most common cancer among women globally and in Kenya. Although early cervical cancer screening, (CCS) and treatment is an effective method of controlling the disease, there is generally poor uptake of screening services in Kenya and Kakamega County in particular. Currently, women only screen for cervical cancer when they experience symptoms suspected to be associated with it or when they are asked by health workers. Community health strategy (CHS) is a health-care delivery approach in which community people are empowered to participate in their own health-promoting activities with the help of Community Health Volunteers (CHVs). The main objective of the study was to integrate uptake of cervical cancer screening awareness creation in community strategy in Kakamega County. Specifically, the study sought to identify available resources supporting Cervical Cancer Screening in public health facilities, assessed knowledge, attitude and practices on Cervical Cancer Screening; evaluated the impact of providing focused cervical cancer education and awareness creation through Community Health Volunteers, (CHVs) on the uptake of cervical cancer screening and analyzed post intervention factors influencing uptake of Cervical Cancer Screening. This was a cluster randomized trial study design. Multistage sampling techniques were utilized. Sixteen Community Units out of 422 in Kakamega County were randomly selected and assigned either to intervention (n=8) or control (n=8) groups. A total of 872 women aged 25-49 years from the community were enrolled in intervention (n=432) and control (n=440) groups. Intervention was Health education on aspects of Cervical Cancer Screening. The Health Education was administered to women by Community Health Volunteers from their homes. Participants responded to the questionnaire at enrollment (all) and at six-month follow-up (intervention group). The primary outcomes were final screening rates and change in knowledge and attitude scores at six-month follow-up. Secondary outcomes were changes in awareness about cervical cancer screening, perception of personal cervical cancer risk, and screening acceptability. During follow up, significantly more participants in the intervention (58%) than control group (31%) screened for cervical cancer ($p=0.01$), had good knowledge (88%) about signs of cervical cancer, and risk factors (84%) for developing cervical cancer ($p<0.01$). Significantly more women in the intervention group perceived that they were at risk for developing cervical cancer (97%), it is possible to detect cervical cancer early by screening (94%) and a positive VIA/VILI test does not indicate presence of cervical cancer ($p<0.01$). In conclusion, integrating uptake of CC awareness creation for screening in community strategy is an effective strategy of increasing demand for CCS services among women. It is recommended that Community Health Volunteers should be empowered through training and expansion of scope of practice by the county governments to create awareness on cervical cancer screening among women.

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LIST OF ABBREVIATIONS AND ACRONYMS

AGC	Atypical Glandular Cells
AIS	Adenocarcinoma in Situ
ASC	Atypical Squamous Cells
ASC-H	Atypical Squamous Cells: Cannot Exclude A High-Grade Squamous (Intra) Epithelial Lesion
ASCUS	Atypical Squamous Cells of Undetermined Significance
CC	Cervical Cancer
CCS	Cervical Cancer Screening
CHC	Community Health Committees
CHEWs	Community Health Extension Workers
CHIS	Community Health Information System
CHS	Community Health Strategy
CHS	Community Health Strategy
CHU	Community Health Unit
CHV	Community Health Volunteers
CHW	Community health worker
CIDP	Community Integrated Development Plan
CIN	Cervical intraepithelial neoplasia
CUs	Community Units
DHIS	District Health Information System
HPV	Human Papillomavirus
HSIL	High-Grade Squamous Intraepithelial Lesion
IEC	Information, Education and Communication
KDHS	Kenya Demographic Health Survey
KNBS	Kenya National Bureau of Statistics
LBC	Liquid-Based Cytology
LEEP	Loop Electrosurgical Excision Procedure

LMIC	Low- and Middle-Income Countries
LSIL	Low-Grade Squamous Intraepithelial Lesion
MMUST	Masinde Muliro University of Science and Technology
Pap	Papanicolaou
PID	Pelvic Inflammatory Disease
STI	Sexually Transmitted Infection
VIA	Visual Inspection with Acetic Acid
VILI	Visual inspection with Lugo's iodine
WHO	World Health Organization

OPERATIONALIZATION OF TERMS

Attitude*:* It is a woman's belief about cervical cancer screening that will determine her decision to screen or not to screen. Positive attitude causes her to go to screen while negative attitude will prevent her to screen.

Awareness: Displays a woman's understanding of cervical cancer screening. It does not necessarily imply knowledge, just an ability to be conscious of, feel or perceive CCS.

Cervical Cancer Screening; the systematic application of one of the tests (VILLI/VIA, Pap smear, or HPV DNA test) to identify cervical abnormalities in an asymptomatic woman

Community health unit: comprises approximately 1,000 households or 5,000 people who live in the same geographical area, served by one common CHEW.

Community Health Volunteers: Female and/or male individuals chosen by the community to address basic health issues of individuals and communities in their respective localities, working in close relationship with health facilities.

Focused CCS awareness; Health education offered to women by CHV one-on-one in their homes

Health literacy; the ability of a woman to understand basic information about Cervical Cancer Screening.

Household; individuals associated with and usually headed by the household head or caregiver

Integration: in this study, it refers to adding and implementing CCS awareness to the other responsibilities of CHVs.

Population-based cancer registry: a register that seeks to collect data on all new cases of cervical cancer occurring in a Kenya or Kakamega County.

Knowledge: ability of a participant to name the signs & symptoms, and risk factors for cervical cancer

Practice: screening for cervical cancer, booked for screening, intending to screen, knowing venue to screen

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Cancer occurrence and death rates continue to rise globally, with an estimated 18.1 million new cases and 9.6 million deaths in 2018 (Ferlay *et al.,* 2021). Among women, cancer of the breast is the leading type of cancer in incidence and mortality, followed by colorectal and lung cancer (for incidence), and vice versa (for mortality). Cervical cancer ranks fourth for both incidence and mortality and seventh overall. In 2020, an estimated 604,000 women were diagnosed with cervical cancer worldwide and about 342,000 women died from the disease (Ferlay *et al.,* 2021). Of this, 84% were from developing countries (Ferlay *et al.,* 2021). However, the most often detected cancer and the leading cause of cancer mortality, significantly vary across countries and within each country depending on the level of economic development and associated social and life style factors (Bray *et al.,* 2018).

Cervical cancer (CC) is a common cancer among women in most low- and middle-income countries (LMICs) (Arbyn *et al.,* 2019). In Africa, there were 117,316 new cases of cervical cancer and 76,745 deaths that occurred in 2020. In Eastern Africa, 54 560 new cases and 36 497 deaths occurred during the same period. Age standardized incidence and mortality rates for cervical cancer in Eastern Africa is 40.1 and 28.6 per 100,000 respectively, the highest globally (Arbyn *et al.,* 2019). It is the second most common cause of cancer mortalities among women in Kenya (ICO/IARC HPV Information Centre, 2018).

It is currently estimated that up to 5250 women in Kenya are diagnosed with cervical cancer annually out of which 3286 die from the disease (Ministry of Health, 2018). In Kakamega County, the uptake of cervical cancer screening has remained low. According to hospital-based reports, only 2.8% of women were screened in 2018. Women are mainly informed of cervical cancer whenever they visit health facilities, through mass media or during sporadic outreach services.

The progression of CC is well recognized, and it provides options for invasive cancer prevention. HPV infection of the Transitional Zone's metaplastic epithelium, long-term HPV infection persistence, clonal progression of HPV-infected epithelium to high-grade cervical cancer precursor lesion (CIN3), and progression of CIN3 to invasive cancer are the four stages. The transition from HPV infection to invasive cancer takes 20 to 30 years if infection is not avoided early, leaving a large window of opportunity to prevent invasive cancer through early detection by way of cervical cancer screening.

Cervical cancer causes and epidemiology are widely documented in the literature. CC begins in the cells that line the cervix. Normal cervix cells develop precancerous alterations that eventually lead to cancer (Nour, 2016), (Binagwaho *et al.,* 2019). The primary cause of cervical cancer is Human Papillomavirus (HPV) infection which is sexually transmitted (Nour, 2016). Although, majority of infections resolve on their own after 2–4 years, a small percentage of them proceed to intraepithelial lesions (Nour, 2016). Predisposing factors to the development of CC include sexual behavior features that are associated to the chance of HPV infection (IARC, 2013).

HPV vaccination and Cervical Cancer Screening (CCS) are now the most effective techniques for reducing the prevalence of HPV infections and their risk for malignancy (WHO, 2014). Vaccination, screening and treating precancerous lesions prevent most cervical cancer cases. If it is detected early and managed effectively, cervical cancer is one of the most successfully treatable forms of cancer. Therefore, the key to controlling CC is prevention and early therapy. HPV vaccination targeting females aged 9 to 13 years has been proven to be efficacious (Louie *et al.,* 2009). Surgery, including local excision, is used in the early stages of the disease, followed by chemotherapy and radiotherapy in the later stages. Pre-malignant disease can be monitored or treated relatively non-invasively if found early.

In Kenya, uptake of CCS is very low, with 3 to 4% in urban areas and only 2.6 percent in rural areas (KDHS, 2014). Underperformance of existing CCS programs, high incidence of Human Papilloma Virus, HPV infection in the general population, absence of efficient preventive and screening programs, and late diagnosis are all possible explanations for the high burden of CC in Low- and Middle-Income Countries (LMICs).

Lack of resources has been shown as one of the barriers to uptake of CCS. Resources include manpower, time, money or cost and facilities which form part of structural factors that affect uptake of CCS. Availability or accessibility of the resources to the client is critical in utilization of the services. Black *et al.,* (2019) recognized structural factors as socioeconomic and demographic conditions, access to CCS, limited infrastructure, time constraints, HCW qualities, costs related to CCS, and community outreach services for CCS. The report noted that women were more likely to go for CCS if they had post-secondary education, lived within a-5 km radius of health facility, and attended

community outreach service. Further, the report observed that women were less likely to go for CCS if they lived far away from the health facilities, there was staff shortage or lack of equipment, long waiting time at health facility, staff are insensitive, lack of CCS skills among HCWs, and high transport and screening cost. CHVs are human resources within the community health strategy who have been used to mobilize women for maternal and child health.

Current efforts to scale up CCS include equipping health facilities with equipment and human resources, training staff, mass media campaigns, regular outreach services and offering CCS services for free in all public health facilities and observing an international cervical cancer month, which is usually every months of February. Through National Cancer Control and Prevention Policy, the government targets to screen at least 30% of women aged 25 to 49 years. Despite these efforts, Kenya's screening coverage remains poor, at 3% in rural areas and 20% in urban areas (Ndejjo *et al.,* 2016). This low uptake of CCS could be addressed by use of Community Health Strategy (CHS), which has been shown to be effective in increasing utilization of maternal and child health services, also known as safe motherhood (Olayo *et al.,* 2014).

Community Health Strategy (CHS) is a health-care delivery approach in which community people are empowered to participate in their own health-promoting activities with the help of Community Health Volunteers (CHVs). The Ministry of Health developed and adopted it as a basic component of the Kenya Essential Package for Health (KEPH) in 2006. (Ministry of Health, 2014). In some other countries, the method is known as the Community Health Worker Program (CHWP), in which community people are employed to provide basic health services to the communities from which they originate.

Such community members rendering the services are generally referred to as 'Community Health Workers' (CHWs) (Olaniran *et al.,* 2017). While in some other contexts CHWs are referred to as Lay Health Workers, (LHW) (Lewin *et al.,* 2010). According to Lewin *et al.,*(2010) the term LHW is broad and includes Community Health Workers, Village health workers, treatment supporters and birth attendants. In the Kenyan context these category of workers are called Community Health Volunteers, (CHVs). CHVs have been shown to be effective in delivering a variety of health interventions, including client referral, providing assistance and advice on topics such as child health, maternal health, medication administration, and treating patients for specific health concerns (Lewin *et al.,* 2010). Several nations, including Kenya, have used task shifting to adopt CHWPs to deliver some basic health services with the goal of improving access and cost of health services to rural and impoverished people as part of a Primary Health Care, (PHC) approach. Governments are still focusing on the usage of CHVs today since existing health services do not match the community's needs (Wangalwa *et al.,* 2012). In Kenya Community Health Volunteers have been major implementers of safe motherhood. Subsequently, maternal and child health indicators have improved including increased skilled deliveries, family planning uptake, antenatal and post-natal care uptake, exclusive breastfeeding, and immunization.

CHS' major focus is to increase community access to and demand for health care as a means of increasing individual productivity and reducing poverty, malnutrition, child and maternal mortality and enhancing education (Ministry of Health, 2014). Since majority of decisions and behaviors that affect a community's health outcomes are made at the household level (KNBS, 2019), CHS puts services closer to the people at the household.

CHVs play an important role in encouraging community people to use these services. Community Health Strategy, according to UNICEF, encourages and serves as an anchoring tool for practically all stakeholders to collaborate in the fight against the majority of causes of ill health at the community level (UNICEF, 2015).

CHVs provide services in the community to promote a healthy lifestyle and avoid diseases, mobilize and encourage community members to use accessible health services, and enable access to facility-based health services in terms of health promotion and disease prevention (Olaniran *et al.,* 2017). Home visits, environmental sanitation, ensuring provision of water supply, first aid, health education, nutrition, and surveillance, maternal and child health and family planning activities, communicable disease control, community development activities, referrals, record-keeping, and collection of data on vital events are all expected of CHVs (WHO, 2007). The main areas in which the use of CHVs is applied and reported, however, are maternal and child health, usually referred to as safe motherhood. It doesn't go into detail about cervical cancer or screening. In addition, the CHV Handbook covers topics such as home visits throughout pregnancy and home visits following birth (Hadley & Maher, 2000) treatment of acute respiratory infections (ARIs), including HIV/AIDS prevention and care (Hadley & Maher, 2000), (Olaniran *et al.,* 2017).

Further, CHVs provide a wide range of primary health care services in many LMICs. The CHVs give health messages to women in the community, increasing their awareness of maternity and newborn care and encouraging competent deliveries *(*Adam *et al., 2016)*. The CHS is a successful way to offer community-based interventions, according to Olayo *et al.,* (2014). According to the CHS requirements, CHVs are available in all locations and

are trained on a variety of issues (Olayo *et al.*, 2014). In order to improve healthcare delivery, job shifting from professional health providers to Lay Health Providers (LHWs) was required in low-income nations due to increased demand for healthcare services and a shortage of health care workers (WHO 1989). Women's health outcomes have improved as a result of integrating health care (Huchko *et al.*, 2011) through safe motherhood (Ports *et al.*, 2015). As a result, certified Lay Health Workers can deliver individual and group health education, or a mixture of the two.

Currently, Community Health Volunteers have not been engaged in creating awareness about cervical cancer screening among women except for referral purposes to screen. Studies have shown that the use of CHVs in sensitizing women about maternal and Child health services has led to increased utilization of this services hence increased skilled delivery, increased uptake of immunization and family planning (Adam *et al.*, 2016).

This study therefore sought to assess the potential of CHVs in supporting CCS in preparation to integrate CCS in CHS.

1.2 Problem Statement of the Study

Cervical Cancer is the second most frequent cancer in Kenyan women aged 25 to 49 years, following breast cancer (MOPHS/MOMS, 2012). Every year in Kenya, 4851 women are diagnosed with cervical cancer, with 2401 (65 percent) dying as a result of the disease (MOPHS/MOMS, 2012). Despite the fact that the condition can be treated if found early with Cervical Cancer Screening, it remains a severe public health danger to women. Cervical Cancer Screening coverage in Kenya is still low, at 3.2 percent (KDHS, 2014), and screening services are often erratic. Women only test for Cervical Cancer when they

notice signs and symptoms or are recommended to do so by healthcare professionals. The majority of CC patients are diagnosed after they have progressed to an advanced stage.

Different groups of women have been investigated in the past to assess routine screening knowledge and practice, and while some have indicated a reasonable degree of knowledge, compared to the uniqueness of the community, very few, if any, have reported a high level of practice (Adamu *et al.,* 2012). Even among health-care workers, routine CCS is not practiced. It has been suggested that all women should be informed about CCS. Efforts to overcome barriers and promote cervical cancer screening among Kenyan women have only been partially successful because strategies have not been tailored to address specific individual concerns about screening, despite evidence that there are multiple reasons for Kenyan women's reservations about screening (Morema *et al.,* 2014; Ngugi, *et al.,* 2012). Currently, women learn about CCS from the media, healthcare staff when they visit health institutions for various reasons, and friends. In Kenya, and particularly in Kakamega County, there has been no deliberate attempt to combine sustained cervical cancer awareness generation and screening into tailored face-to-face community mobilization activities. Community health strategy initiatives are mostly focused on maternal and child health issues, with little attention paid to non-communicable diseases. Integration of Maternal and Child health in CHS in Kenya has effective utilization of Maternal and child health services hence increased uptake of skilled deliveries, immunization, and Family Planning services. This approach has the potential to change the women's perception of being at risk for cervical cancer and demystify the myths surrounding cervical cancer and screening. Despite its enormous impact on women and the county as a whole, no attention is paid to CC. The current resources supporting

CCS in the county are health facilities, health care workers and potentially CHVs. The county has an established and functioning Community Health Strategy. Focused interventions using Community Health Volunteers as part of a community plan may be necessary to encourage this hard-to-reach population to improve their screening habits. Integrating Cervical Cancer Screening awareness and knowledge with Community Health Strategy ensures that the community utilizes its own CHV resources and increases CCS uptake.

1.3 Objectives of the Study

1.3.1 Broad objective

To integrate uptake of cervical cancer screening awareness creation in community strategy in Kakamega County.

1.3.2 Specific Objectives

i. To assess available resources supporting CCS in public health facilities in Kakamega county

ii. To establish knowledge, attitudes and practices on CCS among women in Kakamega County.

iii. To evaluate the effect of providing individualized cervical cancer education and awareness through CHVs on the uptake of CCS.

iv. To determine factors associated with uptake of CCS.

1.4 Research Questions

i. Which resources supporting CCS are available in public health facilities in Kakamega county

ii. What are the baseline knowledge, attitudes and practices on CCS among women in Kakamega County?

1.5 Hypothesis of the Study

H_0; Creating awareness among women on cervical cancer screening through community health strategy does not increase uptake of cervical cancer screening

H_A; creating awareness among women on cervical cancer screening through community health strategy increases uptake of CCS.

H_0; There are no factors associated with the uptake of CCS among women

1.6 Justification of the study

In Kenyan women aged 25 to 49 years, cervical cancer is the second most common malignancy (MOPHS/MOMS, 2012). In Kenya, 65 percent of cervical cancer patients die each year (MOPHS/MOMS, 2012). Despite the fact that CC is most effectively treated if found early by screening, it continues to be a major hazard to Kenyan women due to low screening coverage of 3.2 percent and a lack of awareness (KDHS, 2014). How early the disease is identified and how far it has gone are the most important prognostic markers for cervical cancer (Allgar & Neal, 2005). Early cancer screening and detection results in a lower cancer stage upon diagnosis, resulting in less intensive therapy and improved survival (Allgar & Neal, 2005). Due to inadequate screening uptake in Kenya, the majority of cervical cancer patients have been diagnosed at advanced stages (MOPHS/MOMS,

2012). Women's lack of awareness and perceptions about cervical cancer and screening, as well as their lack of awareness about prevention efforts, have been blamed for the low screening coverage. Households could be used to deliver face-to-face CC and screening messages. Since CHVs are part of the community members volunteering to support the community on health-related issues, they are thought to be better placed to mobilize and sensitize women on cervical cancer screening during their routine home visits. Although Maternal and Child Health (MCH) activities are part of their responsibilities, cervical cancer issues are not explicitly included in their activities. Further, they are limited to only advice women to seek MCH services in the hope that CCS will be a prerequisite for receiving MCH services. Therefore, to achieve significant increase in the uptake of CCS among all eligible women regardless of their demand for MCH services, innovative interventions and delivery systems are required that reach eligible women effectively, efficiently and conveniently. One emerging method that may help overcome these barriers to screening is the use of CHVs to deliver focused health messages to women face-to-face at their homes. The use of CHVs is viable because CHVs are chosen by community members themselves on credibility basis to assist in accessing basic health related issues within the community. Further, CHVs have a strong social network in the community. Community members are able to confide in them issues affecting their health. In India and Malawi, individualized community mobilization through women's groups has been utilized to enhance health care and lower maternal, newborn, and infant mortality (Lewycka *et al.,* 2010; Tripathy *et al.,* 2011). Given that early detection of cervical cancer by routine screening techniques has been found to significantly reduce cervical cancer mortality, (WHO, 2020) attempts to expand Kenyan women's screening practice would

be extremely beneficial. This is justified in the government's policy in National Cancer screening guideline of 2018 (Ministry of Health, 2018).

1.7 Significance of the Study

Community Health Volunteer training on elements of cervical cancer and screening strengthens the community's capacity to raise knowledge about Cervical Cancer Screening and assists women in making decisions on cervical cancer screening. The study will create an approach (combination of Cervical Cancer Screening +Community Health Strategy) that improves the early diagnosis of CC in women. Furthermore, this research dispelled the myths that had previously impeded CCS adoption. Overall, women's health and quality of life is likely to improve, as well as the community's. The findings of this study will aid in the creation of policies and will also add to the body of knowledge in the field of research. The implementation of a cervical cancer prevention and control program will help to achieve the Sustainable Development Goal number 3 (SDG 3); Good health and wellbeing (ensure healthy lives and promote wellbeing for all at all ages) through improving women's health by providing universal access to sexual and reproductive health services. It will further increase women's access to Universal Health Care by demystifying the myths and beliefs that have acted as barriers to uptake of CCS.

1.8 Scope of the Study

This study assessed capacity of available resources in handling CCS activities within the county. It included all Kakamega County women aged 25 to 49. It tested women's knowledge of cervical cancer signs and symptoms, as well as risk factors for the disease. It also assessed women's cervical cancer screening habits and the reasons for not getting screened. In addition, the study judged women's attitudes and beliefs about CCS. Finally,

it measured factors influencing CCS adoption among women, as well as the impact of incorporating CCS awareness creation into community health strategy on CCS uptake. The study was carried out for 6 months, from March 2018 to end of September 2018.

1.9 Limitation of the Study

Study design might allow contamination in the two arms of the study due to social networks among the participants. This was reduced by blinding the outcome to research assistants, CHVs and participants. Further, control and intervention groups were far apart. There were several community Units in-between the two groups, therefore, women and CHVs could not meet easily. There was some participant drop out during follow up period due to change of residence among urban dwellers or rural urban migration. The drop out proportion was insignificant. This was mitigated by following up all participants in both control and intervention groups. Some CHVs were not conversant with CC hence required teaching them about CC. This was time consuming and hence required close supervision. This was mitigated by training all CHVs at one time for three days.

1.10 Theoretical Model

The Trans Theoretical Model (TTM) and the Health Belief Model (HBM), which have both been utilized successfully in promoting positive cancer screening behavior in similar situations, were the theoretical models that drove the development of this intervention (Interis *et al.,* 2015). The TTM evaluates a person's preparedness to change their behavior and offers suggestions to help them progress through the stages of change: pre-contemplation, contemplation, preparation, action, and maintenance. This was based on the fact that people respond to awareness-raising by adopting protective health practices/behaviors (Diclemente & Norcross, 1992). The HBM (Rosenstock *et al.,* 1988)

helps identify barriers and facilitators to behavior change adoption, and it was employed in the intervention to stress the benefits of screening while decreasing hurdles. During intervention, both theories were used to show change of behavior at different stages in the presence of facilitating and barring factors. The outcome variable was cervical cancer screening, which was evidence of a Pap smear test, VIA/VILI test, or HPV test, as well as a written appointment for cervical cancer screening.

1.11 Conceptual Framework

A conceptual framework, according to Mugenda & Mugenda (2003), is a postulated model that identifies concepts under research and their relationships. It's a visual representation of the relationship between the variables being investigated. It clearly establishes the link between the independent and dependent variables in the face of intervening and moderating variables whose effect on the independent-dependent relationship may not be studied in the study.

Health education by CHVs aimed to overcome past problems in individual knowledge, attitudes, perceptions, cultural beliefs, and distance to health facility, and experiences with cervical cancer, as indicated in Figure 1.1. It was expected that women would be ready to undertake behavior modification toward CCS as a result of CHV's health education on CCS. Individual women would go through pre-contemplation, contemplation, preparation, action, and maintenance stages of change, as proposed by TTM. Women's progression along the stages of change would be influenced by perceived benefits and barriers to CCS; as a result, women would be at different levels of behavior change at the completion of health education.

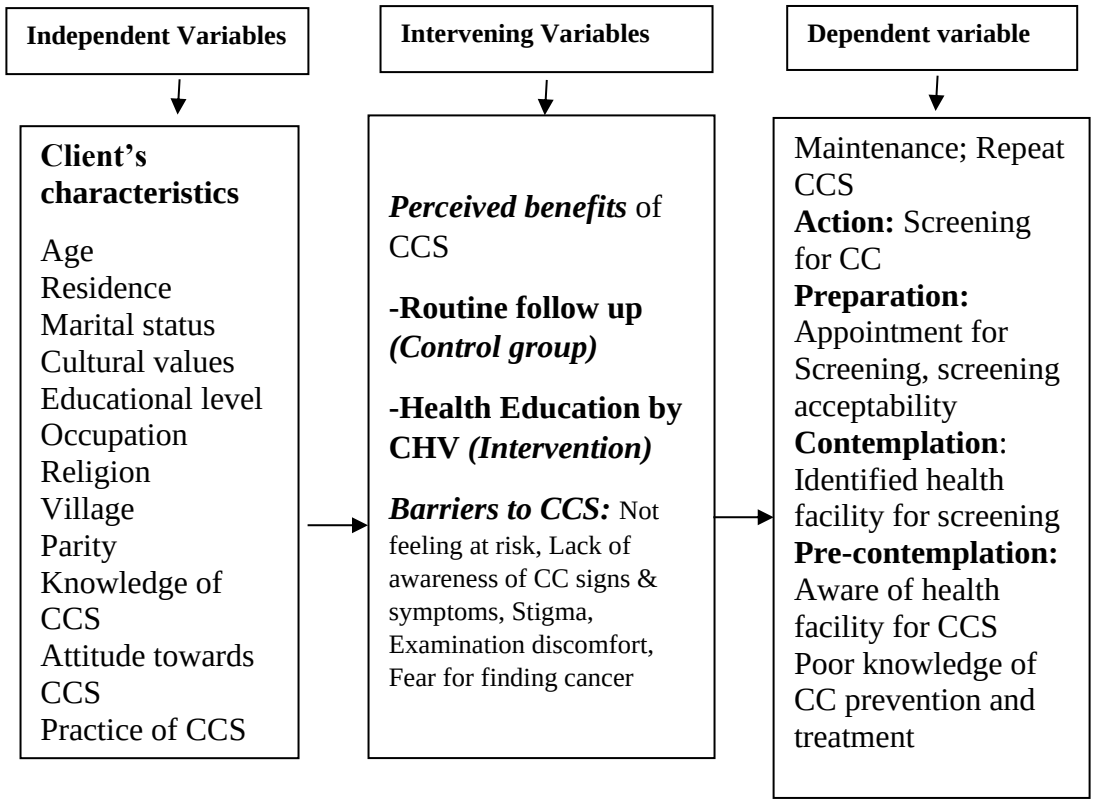

Figure 1.1 Conceptual Framework.
Source: Adopted from Conceptual framework for intervention implementation (McAlearney *et al.*, 2016)

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This section constitute reviewing literature about Cervical Cancer, Individualized cervical cancer screening awareness, factors associated with uptake of Cervical Cancer Screening; socio-demographic characteristics of women, access to screening services, fear by the women for ccs, sources of information about Cervical Cancer Screening, awareness of Cervical Cancer Screening, knowledge on Cervical Cancer Screening, knowledge on risk factors for cervical cancer, attitude of women towards Cervical cancer Screening, perception of being at risk for cervical cancer, accessibility to Cervical Cancer Screening services, and uptake of Cervical cancer Screening. It further reviews on Community Health Strategy, organization of Community Health Strategy, objectives of Community Health Strategy, implementation of community health strategy, roles of Community Health Workers, effectiveness of community Health Strategy in health promotion, Community Health strategy and Cervical Cancer Screening,

2.2 Cervical Cancer

Cervical cancer causes and epidemiology are widely documented in the literature. CC begins in the cells that line the cervix. Normal cervix cells develop precancerous alterations that eventually lead to cancer (Nour, 2016); (Binagwaho *et al.*, 2019). Cervical intraepithelial neoplasia (CIN), squamous intraepithelial lesion (SIL), and dysplasia are all words used to describe these pre-cancerous alterations. The Pap test or VIA/VILI can detect these precancerous alterations, which can then be treated to prevent cancer from

developing. Cervical cancer is divided into two types: squamous cell carcinomas, which account for up to 90% of all cases, and adenocarcinoma (Bray *et al.,* 2018).

According to Nour, (2016), the sexually transmitted Human Papillomavirus (HPV) infection is the primary cause of cervical cancer, accounting for 99 % of all occurrence. There are more than 100 different forms of HPVs. Based on their oncogenic potential, they are classified as "low risk" (LR) or "high risk" (HR). The primary HR types that cause cervical intraepithelial neoplasia (CIN) and invasive carcinoma are HPV 18 and HPV 16, with type 16 having the highest oncogenic potential and global distribution. Persistent HPV 16 and HPV 18 infection can cause precancerous lesions, which can progress to cervical cancer if left untreated. Nour, (2016) further affirms that even if the majority of infections resolve on their own after 2–4 years, a small percentage of them proceed to low- and high-grade squamous intraepithelial lesions.

Other factors that contribute to the development of CC include age at first sexual intercourse, lifetime number of sexual partners, history of sexually transmitted illnesses, and other sexual behavior features that are associated to the chance of HPV infection. Other variables linked to the development of invasive cervical cancer include parity, the use of oral contraceptives, tobacco smoking, immunosuppression (especially related to HIV), infection with other sexually transmitted diseases and poor nutrition (IARC, 2013); (Camargo *et al.,* 2014).

For sexually active people, the lifetime risk of a woman contracting a cervical infection caused by at least one form of HPV is extremely high. As a result, screening and

immunization programs are advised throughout Sub-Saharan Africa (World Health Organization, 2013).

Women in low- and middle-income countries (LMIC) are highly exposed to CC risk factors. Premarital sex or first sex before the age of 18, multiple sexual partners, low condom use during sex, and sexually transmitted illnesses are all risk factors (Louie, *et al.,* 2016).

Attending for screening and receiving the human papillomavirus (HPV) vaccine, (for young girls aged 9 to 14 years) are the most effective ways to prevent cervical cancer (WHO, 2021). Nevertheless, if cancer does develop, early detection helps better survival. Therefore, the key to controlling CC is prevention and early therapy. Early detection through Cervical Cancer Screening (CCS) is the best way to avoid it. In high-resource settings where cervical cancer screening is common, early detection and treatment of precancerous lesions can prevent up to 80% of cervical malignancies (American Cancer Society, 2014). Population-based cervical cancer screening programs have been shown to result in significant decreases in cases by allowing for early detection and treatment (O'Brien *et al.,* 2010).

CCS is now the most effective technique for reducing the prevalence of HPV infections and their risk for malignancy (World Health organization, 2014). Screening coverage in Sub Saharan Africa (SSA), however, is still relatively low, ranging from 2–20 percent in urban regions to 0.4–14 percent in rural regions (Louie *et al.,* 2009); (Ndejjo *et al.,* 2016). In Kenya, the situation is even worse, with 3 to 4 percent in urban areas and only 2.6 percent in rural areas (KDHS, 2010). Cervical cancer is the only malignant tumor that can

be effectively treated by screening (American Cancer Society, 2014). Because pre-cancerous lesions and cancer take a long time to develop, every woman aged 25 to 49 should be screened at least once in her lifetime and preferably more regularly (World Health Organization, 2014) (WHO, 2015c). Cervical cancer takes 15 to 20 years to develop in women with healthy immune systems. In women with compromised immune systems, such as those with untreated HIV infection, it can take as little as 5 to 10 years. The detection of cytological abnormalities in Pap smears or VIA/VILI, as well as subsequent treatment of women with high-grade cytological abnormalities, can help to avoid cervical cancer (Miller *et al.*, 2014). As a result, inadequate attendance at CCS is a significant risk factor for its growth and progression. Those who have never had a cervical cancer screening are at the greatest risk of having a poor health outcome (O'Brien *et al.*, 2010).

According to the American Cancer Society, (2014) "Screening" is an organized, controlled, systematic, public health intervention that is actively and periodically proposed, and that involves the application of a relatively simple, innocuous, acceptable, repeatable, and relatively cheap (for the organization, free for the involved population) test to an asymptomatic and well defined population, in order to obtain detection of cancer at an earlier stage or of a pre-cancerous lesion, with the goal to decrease the mortality and, if possible, the incidence of the tumor, with an effective and conservative treatment, possibly less aggressive than in clinically detected cases. Sensitization efforts in industrialized countries are credited with increased CCS uptake as well as lower CC incidence and accompanying mortalities. Pap smear and liquid based cytology (LBC), Visual inspection with Acetic Acid (VIA) and Visual Inspection with Lugol's solution

(VILI), Human Papilloma Virus DNA testing for HR HPV types are the three types of CCS tests currently available. Loop electrosurgical excision method (LEEP), cryotherapy for low-resource settings, and cold knife Conisation for high-resource settings are all options for precancerous lesions treatment (WHO, 2021). The most commonly used in Kenya is VIA and VILI because of its affordability.

The Kenyan government has made cervical cancer a priority. Ministry of Health designed the National Cervical Cancer Prevention Strategy 2005-2011 in 2005, which was later revised to 2012-2015, and included preventive, curative, and rehabilitative initiatives (Ministry of Health, 2015). As stressed in the policy on Community Health Strategy, the relevance of the community in tackling cervical cancer disease within communities was emphasized. National Cancer Control Strategy 2011-2016 and National Guidelines for Cancer Management in Kenya are two other policy documents established to address the cancer problem (Ministry of Health, 2018). CCS services (VIA/VILI) and cryotherapy are currently available at no cost in all public health facilities. Most cadres of health care personnel, including doctors, nurses, clinical officers, and laboratory technicians, are undergoing CCS and cryotherapy training. All these initiatives are meant to control cervical cancer.

There are gaps in Kenya's cervical cancer screening and prevention activities that may be filled by a well-coordinated program. There are no systematic cervical cancer screening programs, for example, and only low-level opportunistic Pap smear and VIA/VILI testing are performed in public and private health facilities. The HPV vaccine was first introduced in Kenya in 2019, and the uptake has been minimal. The necessity of community awareness and safety is still being worked on.

According to the government's national strategy plan on cervical cancer prevention and control, which was released in 2010, the goal was to screen 30 percent and vaccinate 80 percent of eligible people by 2015 and 2018 respectively, as well as integrate cancer early detection and screening into existing health programs (Ministry of Health, 2015). This remains unachieved.

Due to a dearth of population-based cancer registries, information on cancer incidence in Kakamega County is limited. Cervical cancer screening services are available in a few approved public health facilities, as well as a few faith-based and private health institutions in the County. Only the Kakamega county referral hospital performs Pap smear tests, whereas other public health facilities perform VIA/VILI (DHIS-II, 2016). Screening services are mostly provided at health facilities, with outreach screening services provided on occasion. Both the county and national governments have cooperated with various non-governmental organizations to train healthcare workers at various levels. Women in the county are being educated about cervical cancer through media and at opportune times whenever they visit health institutions for other reasons, such as Maternal and Child Health services.

Measures to reduce cervical cancer rates in Kenya are aimed at overcoming structural barriers by expanding and equipping health facilities, improving human resources for health, and strengthening capacity. Non-structural impediments, such as cultural views and misunderstandings about CCS, are rarely addressed by interventions.

2.3 Individualized cervical cancer screening awareness

To teach women in the target age group about the benefits and availability of cervical cancer preventive services, an information and education plan based on community-based

initiatives can be adopted. This could lead to an increase in the use of cervical cancer prevention services. This is because direct contact between eligible women and health workers or peer educators is often more effective in increasing service uptake than short-term mass media activities (Naregal, 2017); (Mbachu *et al.*, 2017); (Ebu *et al.*, 2019). Individual therapy can also address the women's information and emotional requirements, encourage them to follow screening and treatment recommendations, and create a satisfied clientele that will encourage additional women to come (Seow *et al.*, 1995). In a study conducted in Singapore on beliefs and attitudes as determinants of cervical cancer screening, it was discovered that for women who had never had a Pap smear, a belief in personal susceptibility was an important determinant, while for women who had previously had a Pap smear, the perceived barriers with a significant influence were discomfort and embarrassment. As a result, culturally acceptable health ideas and attitudes must be addressed in order to increase CCS adoption. Not only should public education be used to influence awareness and views, but it should also be used to break down obstacles. Such impediments can be overcome by creating a conducive environment for the delivery of this critical health service. CHVs can be used to educate and raise awareness about CCS among eligible women in the community as part of Kenya's community health strategy (Seow *et al.*, 1995). There was an improvement in community members' awareness of Mother to Child Transmission of HIV (MTCT), proper and consistent condom use, clinic attendance, and timely HIV testing in a study done to assess the impact of Lay Health Worker programs on the health outcomes of mother-child pairs of HIV-exposed children in Africa (Schmitz *et al.*, 2019). CHVs are effective because they impact change by leveraging on their community experience, expertise, and social networks. CHVs find it simple to discuss crucial themes regarding cervical cancer with

women at risk since they are members of a community with their own social networks. Therefore, incorporating CCS into a community health strategy offers the potential to bring together researchers, community members, and community-based organizations to share expert information and skills, as well as build one another's capacity for improved CCS uptake.

2.3 Factors associated with uptake of Cervical Cancer screening

Women were more likely to get screened if they were suggested by a health care professional and if they had previously been screened (Ng'ang'a et al, 2018). Knowledge of CCS, feeling oneself as at risk of CC, being encouraged to attend screening by a Health Care Worker (HCW), and access to CCS were rated as important facilitators to going for CCS in a systematic review done by Black *et al.,* (2019) in Uganda on barriers and facilitators to uptake of CCS. When compared to their peers, women who had been referred by an HCW were 87 times more likely to be checked for CC, and women found it difficult to present for screening when health facilities were not close.

2.3.1 Socio-demographic characteristics

Cultural attitudes, expense, time commitments, and practicalities (e.g., travel, organizing appointments) involved with cervical screening are all common hurdles to using screening programs (Ngugi, 2012). The proportion of women who have never been screened for cervical cancer varies by area of residence, demographic variables, and Health Belief Model (HBM) constructs, depending on the barrier (Stanley *et al.,* 2015). Regardless of where they live, some women report having difficulty getting health care, this may prevent them from getting Pap tests for CCS (Stanley *et al.,* 2015). Various challenges to CC prevention have been discovered in various populations. Lack of information about CCS

is the most common barrier and a primary predictor of CCS. Challenges in the health-care system, dread of test results and their repercussions, and financial limits are among the others (Ndejjo *et al.,* 2017).

Women who live in low-income, resource-constrained metropolitan locations are less likely to receive timely CCS, but they are more likely to be diagnosed with advanced cancer (Ndejjo *et al.,* 2016); (Black *et al.,* 2019). Other research has found that women who live in rural areas are less likely to receive CCS (Morema *et al.*, 2014).

It is well known that health literacy is linked to educational attainment and age. Women who are aware of and appreciate the importance of CCS are more likely to choose to have regular Pap tests (Stanley *et al.,* 2015); (Nelson et al 2009). Lack of or little awareness of cancer signs and symptoms, a lack of feeling at risk for cervical cancer, and stigma all contribute to low screening uptake (Ngugi *et al.,* 2012).

Participants did not screen because of a busy schedule, a need for more time, a lack of understanding about screening, and fear of pain with the speculum exam, according to Rosser *et al.*, (2015) in a study on the effects of an educational intervention in rural Kenya on changing knowledge, attitudes, and behaviors regarding CCS. Some women were willing to go for cervical screening if they had never done so before. In a research conducted in western Kenya (Rosser *et al.*, 2015b), up to 79 percent of participants responded that they would undergo screening if it was given.

2.3.2 Access to screening services

Low screening uptake is linked to a lack of adequate access, which includes insufficient screening services, diagnostic facilities, poorly structured referral facilities/systems, a lack

of a comprehensive cancer surveillance system, and a lack of a population-based cancer registry (Elizabeth *et al.,* 2012). Lu *et al.,* (2012) found that interventions that improve access to services (e.g., mobile vans and lower screening costs), or individually directed interventions (e.g., one-on-one counseling, tailored and non-tailored letters), or tailored, theory-based interventions (e.g., providing health education designed with cultural sensitivities) were effective in increasing uptake of CCS. Furthermore, when addressing cultural sensitivities, interventions involving community members were found to be more effective than alternative ways (Gannon & Dowling, 2008).

2.3.3 Fear by the women for CCS findings

Fear of finding cancer, examination discomfort, fear of screening due to concerns about excessive pain or bleeding, lack of proper communication on screening procedures, long waiting times, and other logistical issues associated with obtaining screening are all reasons why women are less likely to go for CCS (Morema *et al.,* 2014; Njuguna *et al.,* 2017). As a result, there is a greater need for interventions to persuade eligible women to enroll in CCS. Women may be more likely to be screened if educational resources and tactics for CCS are changed. A possible strategy for increasing demand for CCS is to empower the community by use of CHVs who are part of the community members. The CHVs understand better the culture of the people who are not participating in these screenings. The Kenyan diverse culture has different belief systems and ideas that can influence their health seeking behavior and decisions and whether they receive preventive health services. Programs are required that integrate cultural awareness and seek out women from where they live because place of residence affects women's ability to seek and receive cervical cancer screening (Ngugi *et al.*, 2012).

2.3.4 Sources of Information about Cervical Cancer Screening

Women get to know about CCS through various means depending on the environment. These means of communication include healthcare workers during visitation to the health facilities or during outreach activities, print media, electronic media, and friends/family members or through lay health workers. The radio (media) and healthcare professionals have been found to be the main sources of information about CC in studies done in Uganda by Ajambo *et al.,* (2017) and Mukama *et al.,* (2017). However, in a study done in Botswana by Tapera *et al.,* (2017) on students, majority of participants got information from print media while minority of participants heard from health care workers within health facilities. This was attributed to their occupation and low mean age of 21 years, hence their liking for the media (Tapera *et al.,* 2017).

Given that women who are suggested for CCS by a health care worker (HCW) are over eighty times more likely to be screened for the condition, the use of CHVs has the potential to enhance CCS uptake. According to Ndejjo *et al.,* (2016), women said that HCWs were a good source of information on cervical cancer. Furthermore, women who reported discussing cervical cancer with health care providers had higher intentions to screen. Additionally, Ndejjo *et al.,* (2016) established that a woman being advised by a healthcare worker, knowing where screening facilities are available, and knowing someone who has ever been screened are all independent predictors of CCS (Ndejjo *et al.,* 2016).

2.3.5 Awareness of Cervical Cancer Screening

In a qualitative study that used Focus Group Discussion to gather information from purposively selected women attending ANC clinic in a few health facilities in Nigeria, Ndikom & Ofi, (2012) identified a lack of awareness about screening as a primary factor

influencing CCS uptake. Participants were not aware of cervical cancer and were not using the screening services. Despite this, the women still believed that it is imperative since like for other ailments will aid in early detection and treatment. Generally, cervical cancer and screening are well-known among women in many nations. In a study conducted in Uganda by Ajambo *et al.,* (2017), it was discovered that a significant percentage of participants had ever heard of cervical cancer. Also, up to 78 percent of women aged 23 to 64 who visited a health facility for any reason had ever heard of CC, according to a recent survey in western Kenya (Rosser *et al.,* 2015a). According to the findings of a study conducted in Ethiopia (Tsegaye *et al.,* 2018), 56.8 percent of participants were aware of cervical cancer screening. Almost everybody in a Ugandan population-based cross-sectional survey (Ajambo *et al.,* 2017) had heard of cervical cancer. Having heard of CC is a crucial factor of CC knowledge and, as a result, a predictor of CCS practice.

2.3.6 Knowledge on Cervical Cancer Screening

When it comes to CCS, a woman's level of knowledge is crucial. In a cross-sectional study on women's knowledge and attitudes about cervical cancer prevention in Eastern Uganda, Mukama et al. (2017) found that up to 85 percent of participants knew at least one symptom or indicator of cervical cancer. Contrary to this result, two other researches (Ajambo *et al.,* 2017 & Tesfaye *et al.,* 2019) found that participants in Uganda and Ethiopia had insufficient awareness about cervical cancer and its causes. According to Mahumud1 *et al.,* (2020), women's knowledge and use of CCS services is unequally distributed in low- and middle-income countries, with socioeconomically poor women in the majority of countries.

2.3.7 Knowledge on risk factors for cervical cancer

Women's screening decisions are more likely to be influenced favorably if they are aware of the risk factors for developing CC. In a study on awareness of Cervical Cancer and Human Papillomavirus among female students in an Ethiopian University, Tesfaye *et al.*, (2019) found that knowledge regarding cervical cancer and its causes was lacking hence affected CCS uptake. A study done in Botswana by Tapera *et al.*, (2017) on knowledge of risk factors for cervical cancer showed that the most common risk factors for developing CC known by women were early sexual debut and smoking. Findings by Ajambo *et al.*, (2017) in a study done in Uganda, majority of participants knew that cervical cancer can be prevented by early detection through screening at the health facility. However, only a few of participants knew the correct age at which to start screening. This is further supported by Ajambo *et al.*, (2017) in a different study where almost none of the participants new the recommended age to do first CCS. According to World Health Organization (Comprehensive Cervical Cancer Control; A guide to essential practice), CCS should commence at 25 years of age, (WHO, 2006).

In an interventional study done within Maternal and Child Health (MCH) centers in Egypt by (Fouda & Elkazeh, 2014), to determine the effect of health education on knowledge and attitude of Cervical Cancer, they noted a significant improvement post intervention in all items of knowledge and attitude. Naregal et al, (2017) from India also noted that planned teaching program on CC was effective in improving knowledge of women. Adam *et al.*, 2014) conducted an interventional study to determine the effect of health education via Community Health Workers on knowledge of maternal and newborn care among women in the local community. It was found that the delivery of health messages by

Community Health Workers increased knowledge of maternal and newborn care among women and encouraged deliveries under skilled attendance.

Thus, integrating uptake of cervical cancer screening awareness creation in community health strategy ensures that the community uses its own resources of CHVs to enhance uptake of CCS. This study, therefore, sought to evaluate the acceptability, feasibility and effectiveness of integrating delivering awareness creation and knowledge about CCS as well as motivating women to seek CCS at nearby health facilities using CHVs as contained in the community health strategy.

2.3.8 Attitude of women towards Cervical Cancer Screening

A positive attitude towards CCS is expected to increases uptake of CCS among women. In a study done by Tsegaye *et al.*, (2018) in Ethiopia, more than half of participants had a positive attitude towards CCS. Studies done by Tapera *et al.,* (2017) in Botswana and Ajambo *et al.,* (2017) in Uganda found that majority of participants felt at risk of developing cervical cancer. Similarly, in other studies done by Huchko *et al.,* (2015) & Ajambo *et al.*, (2017), in Uganda and western Kenya respectively, majority of participants who had ever heard of CCS felt at risk for CC although their specific knowledge was generally low. These findings were not supported by (Olubodun *et al.,* 2019) from Nigeria who reported that most respondents did not consider themselves at risk for cervical cancer. This was probably because the study was done among young university students who are not keen on CC. Feeling at risk for developing CC is likely to prompt women to go for screening. Exposure to the risk factors for developing CC influences greatly to its development. The main risk factors include multiple sexual partners, smoking any cigarette, not using a condom during sex, not testing for HIV status, HIV positive status,

history of infection with Sexually Transmitted Infections, early sexual debut before age 17 years among girls. Findings reported by Tsegaye *et al.,* (2018) & Tekle *et al.,* (2020) indicate that most women have their first sexual intercourse before age 17 years. Early sexual debut among girls is a risk factor in developing cervical Cancer. In a study done in Ethiopia by (Tekle *et al.,* 2020), up to 8.7 percent of respondents were cigarette smokers. Peer health education is an effective strategy for increasing women's perception of benefits of early detection of cervical cancer through screening (Mbachu *et al.,* 2017); (Ebu *et al.,* 2019) hence the use of CHVs in this study.

2.4 Uptake of cervical cancer Screening

Even though cancer screening is free in government health facilities, cervical cancer screening is low. Studies done in Ethiopia and 18 other resource constrained countries by Tekle *et al.,* (2020) and Mahumud *et al.,* 92020) on uptake of CCS revealed that the uptake was very low. In Nigeria, Olubodun *et al.,* (2019) reported that only 0.7 percent had done a CCS test. Tapera *et al.,* (2017) attributes such low uptake of CCS to lack of perception of susceptibility to cancer and hence the lesser the likelihood of engaging in preventive behaviors. Further, low uptake is due to opportunistic CCS services practiced in LMIC (Tapera *et al.,* 2019; Black *et al.,* 2019 & Maseko *et al.,* 2015). This opportunistic method of delivering screening services is ineffective since it mostly targets a small proportion of women who have the chance to come in contact with health care providers either in a health facility or within the community for varied primary needs (Okunowo *et al.,* 2018). Therefore, a majority of eligible women are left without screening. Further, opportunistic screening services are not widely accessible; where they are available, the service is totally underutilized (Maseko *et al.,* 2015; Okunowo *et al.,* 2018). In contrast, CCS in Botswana

among university students was relatively higher (27.5 percent) than in Kenya (Tapera *et al.,* 2019).

2.5 Community Health Strategy

Community health strategy (CHS) is a health care delivery approach where community members are empowered to participate in their own health promotion activities through Community Health Volunteers (CHVs) (Ministry of Health, 2014). The Ministry of Health developed and adopted it as a basic component of the Kenya Essential Package for Health (KEPH) in 2006 (Ministry of Health, 2014). In some other countries, the method is known as the Community Health Worker Program (CHWP), in which community people are employed to provide basic health services to the communities from which they originate. 'Community Health Workers' (CHW) are the members of the community who provide the services (Olaniran *et al.,* 2017). CHWs are sometimes referred to as Lay Health Workers (LHWs) in other circumstances (Lewin *et al.,* 2010). They are referred to as Community Health Volunteers in Kenya (CHVs). As a result, the CHWP, LHW program, and Community Health strategy are all the same thing in our setting. The term "Community Health Volunteer," or CHV, will be used in this study.

The CHWP concept has existed for numerous years, but under different titles in each country. When conventional allopathic health facilities were unable to provide basic health care, several countries began to experiment with CHWP. The establishment and deployment of CHWs was spurred by governments' inability to reach the Millennium Development Goals (MDG) and a continuous scarcity of Human Resource for Health (HRH) in low- and middle-income countries (LMIC) (World Health Organization, 2007). CHWPs have been widely endorsed since the 1978 Alma-Ata Declaration as a way to

offer primary healthcare in resource-limited settings (World Health Organization, 2007); (Walt *et al.,* 1990). Due to the difficulty in scaling up the programs, evaluations of the CHWPs were done at first, and their effectiveness was questioned. This was mostly due to a lack of training and supervision, as well as a failure to incorporate LHW activities into the formal health system and resistance from health professionals (Walt *et al.,* 1990). There was a resurgence of interest in CHWPs or CHS in LMICs thereafter. The expanding AIDS epidemic, the reappearance of other infectious diseases, and the failure of the conventional health system to provide proper treatment for persons with chronic illnesses were the main reasons for the revived interest (Hadley & Maher, 2000). With the global Covid-19 pandemic currently wreaking havoc, the need for CHWP has never been greater before than now.

More recently, increased demand and challenges in Human Resource for Health (HRH) in many LMICs have increased stakeholders' interest in the responsibilities of CHWs/LHWs in extending services to 'hard to reach' groups and task shifting (Chopra *et al.*, 2008). Since then, evidence has accumulated on the usefulness of CHWs in delivering various health interventions (Lewin *et al.,* 2010). In Indonesia, for example, CHWs are referred to as "Village Health Volunteers" (VHV). VHVs were integrated into the health posts that were established in each district. Family planning, health education, growth monitoring, dietary support, vaccinations, and diarrheal illness treatment were among their activities. CHWP is a component of Brazil's national Family Health Program. Prenatal care, vaccines, and examinations are provided in Brazil, as well as breastfeeding and oral rehydration (World Health Organization, 2007). CHS was adopted by KEPH in Kenya in 2006 (Wangalwa *et al.,* 2012). It serves as a conduit between the community

and the health-care system. CHS has governance structures provided by Community Health Committees (CHC) (Kimani-Murage *et al.,* 2016). Currently, the government is implementing the Community Health Strategy approach to manage stable patients diagnosed with covid-19.

Currently, governments, Kenya included, are still focused on the use of CHVs through task shifting because the existing human resource in the health system does not meet the service needs of the communities, more so those in rural and poor urban settings.

2.6 Organization of Community Health Strategy

In the Kenyan context, CHWP is synonymous with Community Health Strategy, a health care delivery approach where community members are empowered to participate in their own health promotion activities through Community Health Volunteers (CHVs). CHW is known as Community Health Volunteer. Under CHS, the community is stratified into Community Units (CUs) and further into Villages. Within a community Unit, there are 10 villages. Each village comprises of 30 to 100 households. One CHV is in charge of one village. One Community Health Extension Worker (CHEW) supervises ten CHVs. As a result, each CU has two CHEWs and ten CHVs (Ministry of Health, 2014). A Community Health Committee (CHC) oversees each CU, which is linked to a specific health facility. For outreach at the community level, Kenya's community health strategy relies on community health Extension workers and Community Health Volunteers (CHEWs and CHVs). Through the detection and referral of cases by CHVs, CHS serves as a link between the community and public health facilities.

2.7 Objectives of Community Health Strategy

Kenya's Ministry of Public Health and Sanitation (MOPHS) strived to enhance health outcomes by promoting individual and community health through its National Health Sector Strategic Plan II (NHSSP II). The NHSSP II's goal was to improve health services by implementing a Community Health Strategy (CHS) (Ministry of Health, 2007). CHS' principal goal is to increase community access to and demand for health care as a means of increasing individual productivity. Individual production helps to alleviate poverty, starvation, and maternal and child deaths, as well as increase education (Ministry of Health, 2014). This is because the majority of decisions and behaviors that affect a community's health outcomes are made at the household level (KNBS, 2019). Kenya Essential Package for Health (KEPH), a component of NHSSP II, has improved the government's health-care delivery system at level one. CHS ensures that families and communities are given the tools they need to improve primary health care (Ministry of Health, 2010).

CHS brings services closer to the people that need them. CHVs have a role to mobilize community members to utilize these services. These services include: water, sanitation and hygiene; maternal and child health, immunization, individual birth plan; provision of family planning commodities; growth monitoring for children under 5 years; deworming of children; provision of long lasting insecticide treated nets (LLITNs); management of diarrhea, injuries, wounds, jiggers and other minor illnesses; provision of information, education & communication (IEC) materials; defaulter tracing (ART, TB and Immunization); case finding in the community and referrals to health facilities and first aid services (Ministry of Health, 2014). These responsibilities, however, do not include

specific and standardized cervical cancer and screening (CCS) communication to eligible women. CHVs can be utilized as part of Kenya's community health strategy to organize, educate, and raise awareness about cervical cancer among eligible women in the community, resulting in increased demand for and use of CCS services (Ministry of Health, 2014). The Community Health Strategy promotes and serves as an anchoring tool for nearly all stakeholders to collaborate in the fight against the majority of causes of ill health at the local level (UNICEF, 2015). In a systemic review by Schmitz *et al.,* (2019), it was noted that Lay Health Workers, who are key stakeholders in CHS, play critical roles in maternal education, linkage to care, providing psychosocial support to Mothers Living with HIV and their HIV Exposed Infants, tracing defaulters, promoting exclusive breastfeeding, and presenting mothers and their babies to the clinic.

2.8 Implementation of community health strategy

Communities are already actively engaged in health-related activities for the survival of their households, according to the community health strategy approach. Increased knowledge and abilities could help them improve their health-related actions. The strategy also acknowledges the importance of the health system in assisting community efforts. Improvement in CCS can be attained and sustained by collaboration between the health system and communities. As a result, it's critical for all stakeholders (especially CHVs) to integrate level 1 health activities into the health-care system. Trained community health extension workers and community health volunteers can be enlisted to encourage women to use the program, track women who need to be checked, treated, and followed up on, and provide community-based palliative care.

Given the known relation between CHVs and women, this gives a chance for women to be educated and sensitized about CCS in the comfort of their own homes. This allows women to progress through the stages of learning according to the Trans Theoretical Model (TTM). TTM describes the stages of change that people go through when changing their behavior. On the idea that individuals respond to consciousness-raising by adopting protective health behaviors, the stages are pre-contemplation, contemplation, preparation, action, and maintenance (Diclemente & Norcross, 1992).

2.9 Roles of Community Health Workers

The functions of CHV vary greatly within and across countries, as well as between programs. CHVs play a role in health promotion and illness prevention, treatment of fundamental medical ailments, and data collecting, according to a systematic analysis of peer-reviewed studies and grey literature by Olaniran *et al.,* (2017). CHVs provide services in the community to promote a healthy lifestyle and avoid diseases, mobilize and encourage community members to use accessible health services, and enable access to facility-based health services in terms of health promotion and disease prevention (Feltner *et al.,* 2012). CHVs interpret health information for patients in a complex healthcare system. They also disseminate policy-related health messages to community people, give counseling services to patients with clinical conditions, serve as a link between the community and the health system, and report on community health needs and priorities to the health facilities. Some CHVs give therapy for basic clinical conditions and basic obstetric case management, depending on the country and training level (Olaniran *et al.*, 2017). However, the most common areas where CHVs are used and reported are maternal and child health, notably reproductive health and family planning, and TB care (Hadley

& Maher, 2000), Acute respiratory infections (ARIs) treatment, as well as HIV/AIDS prevention and care (Olaniran *et al.,* 2017). As a result, CHVs give a window of opportunity for eligible women to be identified for CCS education and sensitization. The plan should include raising cervical cancer awareness and education, as well as encouraging women to seek CCS.

Short course instruction on reproductive health issues, child health, nutrition, and hygiene has qualified CHVs for their duties. Cervical cancer is an important aspect of reproductive health, yet it is not included in the community health strategy. The inclusion of CCS knowledge in CHS has the potential to promote CCS adoption. Integration is by empowering CHVs to educate women on CC and Screening. Use of CHVs to educate women on maternal and Child Health issues has revealed increase in skilled deliveries, Ante Natal Care attendance, Post-partum follow-up, completion of Child immunization, and Exclusive Breast-Feeding practices. The home environment enables CHVs together with the women identify and emphasize benefits of screening while minimizing barriers according to Health Belief Model, (HBM).

The educational intervention enhanced knowledge and awareness about cervical cancer screening, but it did not result in higher screening rates in a randomized trial in rural Kenya to examine the effectiveness of a health lecture on cervical cancer knowledge, attitudes, and screening rates. As a result, stigma and personal risk perceptions, which did not differ between research arms at follow-up, may remain be significant hurdles to screening, requiring more than just a health discussion to overcome (Rosser *et al.,* 2015).

2.10 Effectiveness of community Health Strategy in health promotion

Many LMICs rely on CHWs/CHVs to provide a wide range of basic health care services due to a dearth of HRH. Only a few research studies have previously assessed the efficacy of the CHWs/CHVs program (O'Donovan *et al.,* 2019). The majority of these interventional studies looked at how effective CHS was at providing Maternal and Child Health Services. For example;

The distribution of health messages by CHVs boosted understanding of women in the local community on maternal and newborn care, and encouraged skillful deliveries, according to a study (Adam *et al.*, 2016) on the effectiveness of a CHS on enhancing Maternal and Newborn Health in Rural Kenya. CHVs were recruited and trained on the information they would need to be effective in that study. They delivered health messages one-on-one and in small groups to women in their local areas (Adam *et al.*, 2016).

Another quasi-experimental study in Nairobi, Kenya, to determine the potential effectiveness of a Community Health Strategy to promote exclusive breastfeeding (EBF) in urban poor settings found that the prevalence of EBF in the intervention group was significantly higher at post intervention than in the control group. As a result, CHS has the potential to promote EBF in urban poor areas where health care access is limited (Kimani-Murage *et al.,* 2016).

In a different study, the African Medical and Research Foundation used the CHS to develop a community-based maternity and newborn care intervention package in Busia County. The purpose of this study was to see how effective Kenya's CHS is at providing community-based maternal and neonatal health care in Busia County. The change in

important maternity and newborn care practices among mothers with children under the age of two years was evaluated using an interventional, non-randomized pre-test post-test study design. There was a statistically significant increase in attendance of at least four antenatal care visits, competent deliveries, receiving intermittent preventative therapy, HIV testing during pregnancy, and EBF at the conclusion of the intervention. As a result, it was determined that CHS provides a suitable platform for delivering community-based health interventions (Wangalwa *et al.,* 2012). Ayiasi *et al.,* (2016) reported that VHTs effectively encouraged correct cord and thermal care for newborns in a community-based intervention trial in Uganda to investigate the influence of Village Health Team (VHT) home visits on maternal and newborn care practices. They also increased the number of people seeking medical help in a timely manner for skillful delivery and neonatal sickness. They also accurately referred patients.

It was found in a scoping review of studies that assessed the impact of Lay Health Worker programs on the health outcomes of Women Living with HIV (WLH) and their HIV-exposed infants (HEIs) that LHW interventions increased access to Prevention of Mother-To Child Transmission (PMTCT) services and reduced HIV Mother to Child Transmission (MTCT). Community knowledge of MTCT, proper and consistent use of condoms during intercourse, clinic attendance and timely HIV testing of HEIs, and retention in care for infected persons all improved as a result of LHW programs. However, they had little effect in enhancing adherence to ART (Schmitz *et al.,* 2019).

In the Cochrane Collaboration, Lewin *et al.,* (2010) conducted a systematic review of the literature on the effect of engaging Lay Health Workers (LHWs) to promote Mother and Child Health (MCH) and to assist patients with infectious diseases. According to a

summary of the findings from the various studies reviewed, the use of LHWs, as opposed to traditional healthcare services, is likely to result in an increase in the number of women who begin to breastfeed their child, who breastfeed their child at all, and who practice Exclusive Breastfeeding; an increase in the number of children who have their immunization schedule up to date; fewer deaths among children under the age of five; a rise in the number of parents seeking medical help for their sick kid; an increase in the number of tuberculosis patients who are cured (Lewin *et al.,* 2010).

At the national level, all components of CHS were functional, according to a separate quasi-experimental study (Olayo *et al.,* 2014) to assess the impact of CHS on health outcomes in Kenya. Health Facility Committees and Community Health Committees existed and were active participants in the CHS implementation. Furthermore, CHVs were available and trained on a variety of topics in all communities, as required by the CHS criteria (Olayo *et al.,* 2014). Home registration and update every six months, monthly household visits, active case discovery, primarily in households with pregnant women and under-five children, and referrals of pregnant women to clinics for antenatal visits were all essential functions of CHV, according to CHS standards (Ministry of Health, 2007). CHS is a successful strategy to delivering community-based health interventions, according to Olayo *et al.,* (2014), since it results in improved health outcomes. Essential mother and newborn care practices such as prenatal care and competent deliveries are among the interventions. Household members are supplied with the required knowledge in the sociodemographic context to enable them to make appropriate decisions regarding maternal and neonatal health needs, resulting in a positive health outcome.

CHVs frequently make house calls on a regular basis. Immunization, solid waste management, water purification, family planning, and prenatal care are some of the primary subjects discussed by the CHVs during house visits. The goal of discourse is for it to result in action. CHVs identified children who were not immunized and pregnant women who were not attending ANC from their household records and referred them to the Community Unit's affiliated health facility for immunization and ANC follow up (Ministry of Health, 2007).

Despite the widespread implementation of Kenya's community health strategy since its inception in 2007, there has been little, if any, attempt to integrate CCS knowledge into CHS. The absence of CCS content in the CHV manual is a good example of this. Furthermore, greater evidence is needed to determine the strategy's success in improving general health (UNICEF, 2015), as well as the awareness, attitude, and adoption of CCS among eligible women. Only a few studies have looked explicitly at the effectiveness of CHS in improving CCS uptake among women aged 25 to 49. Although it is now being utilized to improve areas of mother and child health, there is a direct link between the program and CCS that is now missing. According to (Olayo *et al.*, 2014), constant exposure of the community and household members to important maternal and newborn care messages resulted in greater adoption of health practices by mothers or newborn carers. As a result, repeated exposure of women in their homes to messages on the necessity of CCS may lead to a shift in women's attitudes on CCS practices. Therefore, the goal of this interventional study is to establish evidence of CHVs' usefulness in giving basic health education on CCS to women, as well as to determine the factors that influence their performance.

2.11 Community Health strategy and Cervical Cancer Screening

Task-shifting to LHWs known as Community Health Volunteers, benefits Maternal and Child Health (MCH) services at the community level. However, information on the effectiveness of community-based CHVs in raising CCS awareness in the country is lacking. Health education was carried out by person-to-person communication by health workers during house visits for women in the villages in a community-based interventional study in India's Solapur district, which included integration of CCS sensitization in community mobilization intervention run through health workers. The outcome of the health education program was compared between two groups (cervical cancer incidence, stage distribution, survival, and mortality). Four years after the intervention began, it was discovered that the intervention group's stage distribution and mortality had much improved (Lu *et al.,* 2012). As a result, trained Lay Health Workers can deliver individual and group health education, or a mixture of the two. The low CCS uptake has resulted in an increase in the number of CC cases diagnosed at advanced stages of the disease. The success of these interventions is influenced by a number of factors, including the type of intervention and the characteristics of the research population (Lu *et al.,* 2012). Some evidence was discovered in a systematic evaluation of randomized controlled trials on interventions to improve cancer awareness and early presentation suggesting community mobilization through individual interventions promotes short-term cancer awareness. However, there was little evidence that public education efforts diminish breast cancer, malignant melanoma, and retinoblastoma stage at presentation (Austoker *et al.,* 2009). In related studies conducted in Malawi and India, individuals were helped by face-to-face community mobilization initiatives carried out by women's

organizations, which resulted in improved maternal and newborn health and fewer deaths (Lewycka *et al.,* 2010; Tripathy *et al.,* 2011).

CHVs can be utilized as part of Kenya's community health plan to organize, educate, and raise awareness about cervical cancer among eligible women in the community, increasing demand for CCS services. In India and Malawi, women-led community mobilization has been used to enhance health care and reduce maternal, newborn, and infant mortality (Lewycka *et al.,* 2010; Tripathy *et al.,* 2011). Women have regular interactions with CHVs on health-related topics as part of the community health plan (Olayo *et al.,* 2014).

2.12 Resources used in cervical cancer screening

Resources can be looked into as human resources and health facility resources. Resources are an important factor in determining uptake of CCS and treatment (Mahumud1 *et al.,* 2020). According to a study done in Zimbabwe to investigate health system constraints affecting uptake of treatment and care by women with cervical cancer (Tapera *et al.,* 2019a), the following health system constraints were identified; limited or lack of training for healthcare workers, weak or lack of surveillance system for cervical cancer, limited access to treatment and care, inadequate healthcare workers, reliance of patients on out-of-pocket funding for treatment services, lack of back-up for major equipment, high costs of treatment and care, lack of knowledge about cervical cancer and bad attitudes of health workers, few screening and treating centers located typically in urban areas, lack of clear referral system resulting in inflexible processes, and limited screening and treating capacities in health facilities due to lack of resources. This is in agreement to findings by (Maseko *et al.,* 2015) in a study done in Malawi on health systems challenges in cervical cancer prevention program in Malawi in which it was found that there existed health

system challenges in areas of health workforce and essential medical products and technologies. Only 30 percent of health facilities provided both screening and treatment. There were inadequate service providers, those available were poorly supervised, lack of basic equipment and stock-outs of basic medical supplies in some health facilities and inadequate funding of the program. In most of the health facilities, service providers were not aware of the policy which govern their work and that they did not have standards and guidelines for cervical cancer screening and treatment.

2.12 Summary of Literature Review

The reviewed literature examined the burden of cervical cancer, efforts being used by countries to address low uptake of CCS and factors which influence behavior change towards cervical cancer screening. It further reviewed concept of Community Health Strategy and its use in health promotion. The review showed a number of countries use Community Health Strategy concept in delivery of basic health services and health promotion, that high income countries have minimal cervical cancer burden due to heavy investment in early diagnosis and treatment through increased sensitization of the population. Low income countries especially sub-Saharan Africa carry the heaviest burden of cervical cancer due to low screening rates. From the literature, majority of women are aware of CCS, have good knowledge about signs and risk factors for CC, and have a positive attitude towards CCS. Further, women perceive that they are at risk for cervical cancer (Huchko *et al.,* 2015). However, despite this, the uptake for CCS is low. This is due to individual's socio-cultural barriers that need individualized awareness creation. Although the ordinary sources of information which is media and health workers within the health facilities remain crucial in awareness creation, it is unable to address

these socio-cultural barriers hence uptake is low despite good knowledge and attitude. The integration of maternal and Child Health in Community Health Strategy in other countries and in Kenya in increasing the uptake of MCH services has been effective. However, the focus has only been on specific areas of Maternal and Child health services with the exclusion of cervical cancer screening awareness. Health systems provide a major challenge in accessing health services. This study therefore integrates CCS awareness creation for screening in community Health Strategy by use of CHVs to increase uptake of CCS. Special emphasis should be put on training CHVs extensively on aspects of cervical cancer and its screening, since they are the primary sources of Health Promotion.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Area

Study area was Kakamega County. Kakamega County is administratively divided, in descending order of size, into, sub-counties, wards, locations, sub locations and villages. Community units are formed along the sub locations. The county covers a land surface area of approximately 3051km^2 with an estimated population of 1,843,320, comprising of 947,254 females (51.4 percent). Women aged 25 to 49 years constitute 208,905 (11.3 percent) (KNBS, 2016).The county's fertility rate is 5.6 which is above the national average of 4.6 (KDHS, 2014). The population growth rate for the county is estimated at 2.5 percent over 9-year period. It has twelve sub counties (administrative units) including Lurambi, Shinyalu, Malava, Lugari, Likuyani, Butere, Khwisero, Mumias East, Mumias West, Matungu, Navakholo and Ikolomani sub counties. The county has an urbanization rate of 13.7 percent, (252,611 people out of 1,843, 320), compared to the national urbanization rate of 32.9 percent. The main economic activity in the county is small scale peasant farming involving maize planting and animal husbandry; and commercial sugar cane growing. The County health system makes CCS available through a network of 299 public health facilities including; One County Referral Hospital, nine sub-county hospitals, 32 health centers, 140 dispensaries and outreach clinics. In addition, it has 39 and 72 faith-based and private health facilities respectively (DHIS-II, 2017).

Kakamega County was chosen based on its high population compared to the other counties in western Kenya (KNBS, 2009), high HIV prevalence rate 4.0 percent (NACC, 2016) (KDHS, 2014) and poor maternal health indicators reflected by increased unmet

reproductive health needs (KDHS, 2014). Further, the county has a functioning community health strategy in place. Women living with HIV are at increased risk of developing cervical cancer and experience more rapid progression of the disease. (NACC, 2016)**.** Community health strategy within the county is being implemented through 422 community units (CU) serving 355,679 households (HH) currently.

3.2 Study Design

This was a cluster randomized trial (CRT). CRT research attempts to answer questions such as: "Does a treatment or intervention have an effect?" and it is the most appropriate method when evaluating interventions which by their nature have to be implemented at a community; and it is used to avoid resentment or contamination that might occur if unblinded interventions were provided for some individuals but not others in each community (Hayes & Bennett, 1999).

3.3 Study Population

Study population were women residing in Kakamega County, while target population were women aged 25 to 49 years (Ministry of Health, 2015) residing in Kakamega County for the last 1 month. This age group was chosen because of their eligibility to access screening and higher risk of cervical cancer (Ministry of Health, 2015). Further, the focus of cervical cancer screening program in Kenya is women aged 25 to 49 years (Ministry of Health, 2015). Women not within these age limits and requested or were recommended for cervical screening were not denied CCS, however they were not included in the study. Majority of women in this age group residing in rural areas spend much of the time on their farms and house chores. Those staying in urban areas are mostly in formal and informal employment.

3.3.1 Inclusion criteria

Women aged 25 to 49 years who had been residing in Kakamega for at least the last one month before the commencement of the study. Also, Health care worker in charge of the link health facility and Community Health Volunteers assigned within the selected villages of the study area.

3.3.2 Exclusion criteria

Women with the following attributes were excluded from the study; declined to provide written informed consent, diagnosed with precancerous or cancerous lesions of cervix previously, had undergone hysterectomy or was pregnant at time of enrolment.

3.4 Study Variables

3.4.1 Dependent variables were screening for cervical cancer, intention to go for screening, knowledge and attitude change on cervical cancer and screening

3.4.2 Independent variables were age, socio-demographic factors, knowledge and attitude on cervical cancer, and perceived benefits of screening, availability of health workers and facilities and distance from health facilities.

3.5 Sampling design

Multi stage sampling was used.

3.5.1 Sampling strategy

CUs were chosen as clusters to facilitate a wide geographical coverage of the study area as well as subpopulations of women in terms of socioeconomic status. Out of 12 sub counties, 8 were purposively sampled based on their consistency of reporting on CHS activities in the preceding three months. Three sub counties had no reports for the last four

months. The fourth sub county had all the reports, however it was randomly selected for piloting. A list of all CUs in the 8 sub counties were obtained from the head of community health strategy, County office. From the list, CUs which had been active by filing reports at the county office for 12 months preceding the study were listed. Two CUs were randomly selected from each of the 8 sub counties, totaling 16 CUs. In each sub county, one CU was randomly allocated to either intervention or control group by tossing a coin. Hence, 8 CUs in intervention and 8 CUs in control groups **(Appendix I)**. Using Global Positioning System (GPS), all selected Households (HHs) and health facilities were located on the map of Kakamega County. In case two CUs were bordering each other and were in two different groups, a replacement of the CU in control group was done. Physical counting of the CUs from the one replaced was done. The next third CU was selected if it had not been selected or if it was not bordering a CU in intervention community. This was to ensure a buffer between intervention and control group hence reduced chance of contamination. A list of all the 10 villages per selected CU from each group was drawn. 30 percent of Villages from each CU in both groups were selected by simple random sampling (Mugenda and Mugenda, 2013). According to Mugenda and Mugenda (2013), when the study population is less than 10, 000, a sample size of between 10% and 30 percent is a good representation of the target population and hence 30 percent of villages was adequate for analysis. Since there were 16 CUs, thus each group had 870/2 = 435 women. 8 CUs with 435 women, thus each CU had 435/8 =54 women. Since each CU has 10 villages, 30 percent of this was chosen randomly, hence there were (10 villages x 0.3) =3 villages per CU). Each CU had 3 villages, thus each village had 54/3=18 women. Since 3 villages were selected from each CU, therefore 54 households were shared equally to the three villages per CU, thus each had 18 HHs.

3.5.2 Selection of the House holds

Using the county community health strategy data, all the households registered by the CHS program for routine CHV follow up were used to map households in the selected CUs. One research assistant was allocated in each of the randomly selected CUs. Three villages were randomly selected from each of the sixteen CUs by the respective village elders picking folded papers with village names. In each village the first household was randomly selected by tossing a coin then the subsequent households were selected after each other until 18 households were reached. Only one eligible woman in the selected household was enrolled in the respective groups. In case more than one woman in a household met the inclusion criteria, the eldest woman was chosen. A list of eligible female household members according to the predefined inclusion criteria was generated. This list was scrutinized by a data auditor and the researcher. This was confirmed and became the list of participants meeting the inclusion criteria for the respective group.

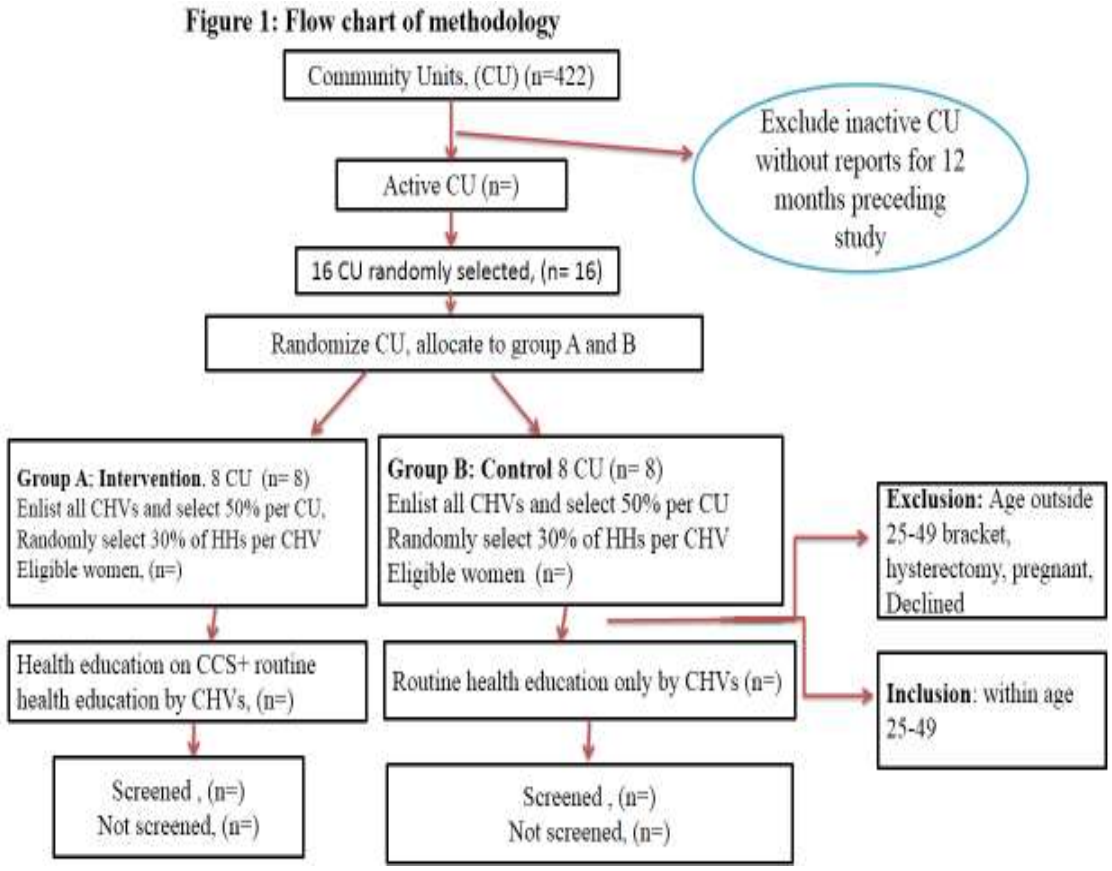

Figure 3.1 Flow chart of methodology

Key:

CU; Community Unit

HH; Household

Table 3.1 Multistage sampling

Category	Population size (N)	Sample size (n)
Sub county	12	8
Community Units	422	16
Villages	160 (10 in each CU)	48 (160 x 0.3) per CU)
Households, (HH)	4800	870
Women per group		435

3.6 Sample Size Determination

Simple random sample size calculation for cluster randomized trials was used to determine the appropriate sample size (clusters) for detecting a difference between two groups; intervention group and control group (Hayes & Bennett, 1999).

$C = 1 + (Z_{\alpha/2}+Z_{\beta})^2 \{(\Omega_o+\Omega_1)/¥+ K^2 (\Omega_o^2 + \Omega_1^2)\}/ (\Omega_o - \Omega_1)^2$ (Hayes & Bennett, 1999)

Where:

- C = Number of clusters, which are community units
- $Z_{\alpha/2}$ is the critical value of the Normal distribution at $\alpha/2$ (for a confidence level of 95%, α is 0.05 and the critical value is 1.96),
- Z_{β} is the critical value of the Normal distribution at β (for a power of 80%, β is 0.2 and the critical value is 0.84).
- ¥ = Number of persons in each cluster for follow up, which is number of HHs per community unit, 1000 HH in one CU.
- Ω_o = current prevalence of CCS in the county in the absence of intervention, which is 3.2%
- Intervention will increase uptake of CCS by 30% (Ministry of Health, 2015)
- Ω_1 = expected prevalence of CCS in the county after intervention, which is 4.16%
- $K^{2\ =}$ coefficient of variation (SD/mean) of the true rates between clusters within each group (0.25) (ranges between 0.1 to 0.5) (Hayes & Bennett, 1999)

Therefore, the number of clusters will be 16 Community Units.

The desired sample size per group was determined using Cochran *(1963:75),* (Israel, 1992) and multiplied by the design effect (MOH, 2016)

$$n = \frac{\mathrm{D}(\mathrm{Z}^2\mathrm{pq})}{\mathrm{e}^2}$$

Where n was the sample size for one group,Z^2 was the abscissa of the normal curve that cuts off an area α at the tails; (1- α) equals the desired confidence level e.g 95% (1.96); P was the estimated proportion of an attribute that is present in the population (22% CCS uptake); q was 1-p (78% non CCS) and e was the desired level of precision (0.05). D was the design effect (1.5)

$$\mathrm{n} = \frac{1.5(1.96^2\mathrm{x}\ 0.22\ \mathrm{x}\ 0.78)}{0.05^2}$$

n = 395 per group

According to (Singh & Masuku, 2014) and (Kish, 1965) the sample size was increased by ten percent (10%) to compensate for nonresponse.

Loading 10% to cater for non-responses $\frac{10}{100} \times 395 = 40$

Sample size plus ten percent, therefore, was $395 + 40 = 435$ per group

The sample for the study was $434 \times 2 = 870$

Therefore, the number of clusters were 16 Community Units, and the sample size was 870

3.7 Data and Information Collection

3.7.1 Training of Research assistants and Community Health Volunteers

A team of 16 research assistants, one for each CU were recruited and trained. These were female nurses with Bachelors of Science in Nursing (BSc.N) awaiting to commence internship. It was assumed that female nurses would enable women to feel free when communicating. They were trained in a three-day workshop on how to enumerate households, identify and interview eligible women and how to use the questionnaire. The CHVs in the respective selected CUs were recruited and trained on how to administer

health education to participating women. The CHVs attended a 3- day training workshop. Those in the intervention group were trained on aspects of cervical cancer screening. This was to develop knowledge and attitude on aspects of CCS including meaning of cervical cancer, risk factors of cervical cancer, signs and symptoms of cervical cancer, preventive measures, recommended age for screening, importance of early screening, and screening tests for cervical cancer. CHVs in control group were reminded of aspects on Maternal and Child Health services (safe motherhood). CHVs in both groups were also trained on how to communicate the respective information to women, and how to refer participants who need senior review. Two Community Health Extension Workers, (CHEW) were recruited to supervise the CHVs. One female gynecologist working in the County referral hospital was recruited to review and manage or refer as appropriate, participants who turned positive during CCS. Health facilities within the participating CUs were approached and informed about the research project to be commenced. Through the heads of these facilities, staff dealing with CCS were sensitized on the research project and requested to receive the referral cards brought by the participants. Women were given a different card by the health care worker on which they would comment. The comments made on the card were either screening was done, booked for screening at a later date or reason for not screening. These were the cards from which the researcher and research assistants referred to verify for screening or any behavior change.

3.7.2 Data Collection Procedure

Local leaders and CHVs in the selected CUs guided the identification and recruitment of participants fulfilling the inclusion criteria. The participants were approached and invited to participate in the researcher administered questionnaire. Eligible participants were

apparently healthy women aged 25–49 years with an intact uterus, no past history of cervical cancer, and living in the study clusters. Participants from both groups were approached in their homes by members of the trained research team and asked if they would like to participate in the study promoting cervical cancer awareness for screening. Women who met the inclusion criteria and expressed interest in participating, each was taken through the informed consent process and written consent obtained prior to commencement of the interview. All participants completed a pre intervention researcher-administered questionnaire on the day of enrollment. The pre- and post-test questionnaire adopted from a tool used in a previous research (UCL, 2011), and informed by findings from previous cancer studies conducted in Kenya, (Morema *et al.,* 2014); Ngugi, *et al.,* 2012; (Khozaim *et al.,* 2014) was administered by the research assistants before and after the intervention. The research assistants begun with questions on socio-demographic information and their predisposition to CC, the knowledge and attitude on CCS, previous CCS experiences, and barriers to screening. Data was captured by use of data collection software, CS Entry app on the mobile phones. The questionnaire assessed for the changes in cervical cancer knowledge, attitude and CCS practices after participating in the intervention. It also allowed for assessment of progress towards uptake of cervical cancer screening through the stages of behavior change as contemplated by Trans Theoretical Model, TTM. As data was collected, it was examined for completeness, comprehensibility, consistency and reliability. Women who decided to go for CCS were encouraged to go to the nearest CCS health facility within the CU as listed on the referring card. Every participant was issued with a referral card to be presented to the health facility whenever she decided to screen. The referral card contained participant's unique number, CU code number, referring CHV and reason for referral. Once this card was presented to

the health facility, the health provider indicated on the card whether the participant was screened or booked for screening and date or not screened and reason. On the back of the referring card was a list of health facilities within the participant's CU and mobile number of CHV. Participants were encouraged to present those cards to the health care providers whenever they visited health facility for further management on issues related to CCS. All women who screened positive were referred to the gynecologist to be reviewed further and managed according to the clinical protocol. Those who qualified for cryotherapy were done immediately after review. Those with large precancerous lesions or invasive cancers were referred by the gynecologist for appropriate further investigations and treatment. The researcher kept track of all those referred for further management.

3.8 Data Collection Instruments

A checklist and a questionnaire were used; a checklist on available health resources (CHVs and Health Facilities) and a questionnaire for the woman on knowledge, attitude and practice of CCS. The checklist focused on appraising capacity of health facilities to offer cervical cancer screening. It had checklist items on community health volunteers which represented human resource factors and checklist items on heads of link health facilities. The questionnaire for the woman was structured interviewer-administered which assessed pre- and post-intervention knowledge, attitude and practice of women on cervical cancer screening. The study adopted a questionnaire developed and used in similar environmental conditions by University College London UCL, (2011) in the United Kingdom. This survey instrument (the Cervical Cancer Awareness Measure, cervical CAM tool) was developed by the University College London, UCL Health Behavior Research Centre, in collaboration with the Department of Health Cancer Team

and The Eve Appeal, with funding from The Eve Appeal. It forms part of the Cervical Cancer Awareness and Symptoms Initiative (CCASI). It is based on a generic Cancer Awareness Measure, (CAM) tool developed by Cancer Research UK, University College London, King's College London and Oxford University in 2007-08. It consisted of 54 questions spread out in five sections and lasted for 30 minutes. Section one sought information on participant's socio-demographic data including age, education level, residence, source of income, marital status and number of births. Section two assessed participants' knowledge on cervical cancer and screening including knowledge on signs and symptoms of cervical cancer, and knowledge on risk factors for developing cervical cancer. Questions in this section seeking information considered to be sensitive were asked last after section four. Data in this section was captured by use of 'yes'/'no'/'do not know' and 'strongly agree', 'agree', 'not sure', 'disagree' and 'strongly disagree' questions regarding cervical cancer knowledge, perception of personal risk, and screening acceptability. Section three had questions concerning access to screening services including whether participants were screened and why not, where they accessed the cervical cancer screening service, previous cervical cancer screening experiences and potential barriers to screening. Section four consisted of a set of 14 questions assessing attitude on cervical cancer screening. The questionnaire was developed in English and then translated to Kiswahili by an expert, the main language used in the study area.

3.8.1 Scoring of knowledge on warning signs of Cervical Cancer

The data was entered and analyzed with the help of SPSS software version 20.0. *Awareness* of cervical cancer was assessed by one yes/no question asking participants if they had ever heard of cervical cancer. The *Knowledge* section was in two parts each with

11 questions. In the first part, participants were to respond to questions regarding signs of cervical cancer by answering ‘yes’, ‘no’ or ‘not sure’ to each question. Each item was assigned 1 for correct response and 0 for wrong response. Therefore, a score of 1 meant correct symptom while 0 was a mark for wrong answer. The knowledge score was calculated by adding all correct responses of items. Then all items were included by applying an 11 points scale. Total points to be scored were 11 and the minimum was 0. The Modified Bloom’s cut off points (Malhotra *et al.,* 2017) was used for assessment of knowledge on signs of cervical cancer in which a score of 80-100 percent of correct responses meant a good knowledge, a score of 50-79 percent meant moderate knowledge and a score of less than 50 percent meant poor knowledge. Therefore, the scores with the respective knowledge levels were good knowledge between 8.8 and 11, moderate knowledge between 5.5 and 8.7 and a poor knowledge with score between 0 and 5.4.

3.8.2 Scoring of knowledge on risk factors for cervical cancer

In the second part, participants were to respond to 11 questions regarding risk factors for developing cervical cancer. Knowledge about risk factors for developing cervical cancer was assessed using a Likert scale with 11 known risk factors for developing cervical cancer. Participants were to strongly disagree, disagree, be not sure, agree strongly or agree with the factors. Agree and strongly agree had a score of 1, while ‘not sure’, ‘disagree’ and ‘strongly disagree’ had a score of 0. Total points to be scored were 11 and the minimum was 0. The Modified Bloom’s cut off points (Malhotra *et al.,* 2017) was used for assessment of knowledge on risk factors for developing cervical cancer in which a score of 80-100 percent of correct responses meant a good knowledge, a score of 50-79 percent meant moderate knowledge and a score of less than 50 percent meant poor

knowledge. Therefore, the scores with the respective knowledge levels were good knowledge between 8.8 and 11, moderate knowledge between 5.5 and 8.7 and a poor knowledge with score between 0 and 5.4. Vulnerability of women to risk factors for developing cervical cancer was captured by nine questions.

3.8.3 Scoring perception

Perception of Risk was assessed by asking participants to respond "yes," "no," or "I don't know" to the question; "Do you think you are at risk for cervical cancer?" "Yes" meant that the woman perceived herself that she is at risk for CC; "no" and "I do not know" meant that the woman did not perceive herself to be at risk for CC. On *perception about screening for cervical cancer*, participants were asked the following three questions which they responded with 'yes', 'no' or 'do not know' except for one question; do you know that it is possible to detect cervical cancer early by screening?, who should get screened for cervical cancer?, does a positive result mean presence of cervical cancer?

3.8.4 Scoring for screening for cervical cancer

Screening acceptability was measured by asking the participant the following questions; 'Have you been screened for cervical cancer before?', 'If you were explained, will you be willing to do the test?', 'How soon will you be willing to screen cervical cancer?' Women who had never been screened were asked their *reasons for not having been screened*. Access to and practice of cervical screening was assessed using a set of six questions which attracted a 'yes' or 'no' response except for one.

3.8.5 Scoring of attitude towards Cervical Cancer Screening

Regarding attitude, a series of 14 questions was used to elicit the participant's attitudes towards cervical cancer screening. In the interviewer-administered questionnaire, these

questions were measured on a Likert-scale with participants responding by either; strongly agree, agree, not sure, disagree or strongly disagree. This is a simplified and improved Thurstone-Droba War scale. The simplified technique involves assigning of consecutive numerical values, 1 to 5, to the different alternatives. After assigning the numerical values to the different possible responses, the score for each individual is determined by finding the average or sum of the numerical values of the alternatives marked (Rensis, 1932). This scale was modified further by collapsing the numerical values of the five alternatives into two numerical values, 0 to 1. Strongly disagree and Disagree scored '1', while not sure, agree and strongly agree scored '0'. A marking key of the assigned values 0 and 1 was used to analyze the responses. One (1) represented a positive attitude while zero (0) represented a negative attitude (Rensis, 1932). The highest mark a participant could score was 14 marks and the lowest was '0' marks. A participant who scored 7 and above out of the possible 14 (above 50 percent) was said to have a positive attitude, while a participant who scored 6 and below (equal to or below 43 percent) was considered to have negative attitude towards cervical cancer screening.

3.8.6 Health Educational Intervention

Intervention tools involved Information Education and Communication (IEC) sessions lasting 30 minutes on aspects of CCS and then followed up in their homes by CHVs ***(Appendix VI).*** There were three sessions administered to individual women from their homes. Specifically, during the IEC sessions, CHVs discussed on basic health facts about cervical cancer, causes of CC, symptoms, risk and protective factors, screening types, screening procedure, what screening results mean, treatment options and recommendations according to the National Cervical Cancer Prevention Program

(NCCPP), (Ministry of Health, 2015). It also included a guided discussion about barriers to screening and fears or stigma associated with screening. For standardization and minimize bias, each session was guided by a flip-chart and corresponding script with content derived from WHO guidelines (WHO, 2002) and other studies of common misconceptions about cervical cancer (Were *et al.*, 2011); Ngugi *et al.*, 2012). Further, CHVs were trained for three days to ensure they understood the content of intervention well and deliver the curriculum uniformly; Similar teaching materials were used on participants by the CHVs. Culturally relevant images as consulted from opinion leaders were incorporated to provide a lively tool for health promotion and to promote understanding of cervical cancer, and include location of the cervix in a woman's body, cost of screening and location of the nearest health facility for screening. The health education kit was written in a simplified English to the level to be understood by those with primary level education. At the end of health education session (intervention), 10 minutes time was allowed for questions from the participants. The intervention tool used a curriculum adapted and modified from educational information and guidelines promoted by Ministry of Health, Department of Reproductive Health (DRH). Participants in control group received the usual routine health messages on reproductive health issues offered under safe motherhood from CHVs. Routine reproductive health messages included information on antenatal care, postnatal care, family planning, immunization and newborn care. Participants in both groups were followed up for six months from march 2018 till end of September, 2018 by the respective CHVs during routine home visiting to reinforce the health messages and respond to arising questions. At the end of six months, all participants from both communities completed a post intervention questionnaire similar to pre intervention questionnaire. For the benefit of participants from control group and

for ethical considerations, participants in the control group were also administered with the health education by CHVs similar to that provided to the intervention groups. This was done one week after post-intervention data collection. Women from both groups were exposed to similar conditions including number of CHV visits during follow-up, except content of health education. During the study period, any woman who was encountered with precancerous or cancerous lesion was referred to the gynecologist at Kakamega County Referral Hospital for further management.

This was a community based personalized mobilization intervention. It was developed by following principles of culturally sensitive information. It involved creating an educational design that was familiar to participants through the use of CHVs, training of CHVs who were also members of the community to deliver the health message in the commonly spoken language, and tailoring the health information to the local context and individual concerns. Each participant was educated at her convenient time maintaining privacy. During the health education sessions, participants chose a suitable place to sit within the home; either in the living room, lounge room or outside the house but within the home compound in the absence of other family members.

3.8.7 Reliability and validity of Instrument

The validity and reliability of Cervical Cancer Awareness Measure was done in a previous study (Simon *et al.,* 2012). Internal reliability (Cronbach's α=0.84 and test-retest reliability r=0.77), both were high. Therefore, Cervical CAM was considered valid and reliable to measure a person's awareness of cervical cancer.

3.8.8 Quality assurance

The potential errors and biases were minimized by: Training research assistants so as to make sure that they understood the questions well; Pre-testing of the questionnaires and any ambiguity corrected before the actual collection of data through pilot study; Random selection of the clusters, random allocation of clusters into two groups and random selection of CHVs and households; The filled questionnaires were reviewed on a daily basis for completeness and accuracy; CHVs were trained for three days to ensure they understood the content of intervention well and deliver the curriculum uniformly; Similar teaching materials were used on participants by the CHVs.

3.9 Pilot Study

A pilot study involving pre-test questionnaires was done on 20 participants in Mumias West Sub County. This sub county was not included in the main study. Two villages in the sub county were sampled randomly which included Nyapora and Mayungu. Two research assistants who were trained for one day assisted to collect data. This was done to assist the researcher to identify gaps in the research instruments, check the clarity of questions as well as training research assistants practically on how to use tools during data collection in the field and how to store collected data.

3.10 Data Management

Once all the data was captured, data cleaning commenced by verifying completeness of entries. All data instruments were checked for completeness. Data was secured under key and lock.

3.10.1 Data analysis

The data were cleaned, coded and analyzed using IBM statistics by two experienced data entry clerks under supervision of data analyst. Data on available resources supporting CCS in public health facilities and knowledge, attitude and practices on CCS was analyzed using descriptive statistics. Descriptive statistics: frequency, means, percentages, the standard deviation was done. Binary logistic regression and multiple logistic regression were used to analyze factors associated with uptake of CCS. Binary logistic regression was done followed by multiple logistic regression. Scores for knowledge of women was interpreted as follows: between 8.8 and 11= good knowledge; between 5.5 and 8.7= moderate knowledge; and between 0 and 5.4= poor knowledge. Good knowledge; -women were labeled to have Good knowledge if they had answered ≥80% of questions in a favorable way. Moderate knowledge; - women were labeled to have moderate knowledge if they had answered ≥50 percent but <80 percent of questions in a favorable way. Poor Knowledge; -women were labeled to have poor knowledge if they had answered <50 percent of the questions in a favorable way. The relationship between independent and dependent variables was tested using the odds ratio using a 95% confidence interval whereby a p-value of <0.05 would reject the null hypothesis in favor of the alternative hypothesis.

Table 3.2 Data analysis methods per objective

Objective	Method of Analysis
1. Available resources supporting CCS in public health facilities	Descriptive statistics
2. Knowledge, attitude and practices on CCS	Descriptive statistics
3. Factors associated with uptake of CCS	Binary logistic regression Multiple logistic regression
4. Effect of providing individualized cervical cancer education and awareness through CHVs on the uptake of cervical cancer screening	Chi square

3.11 Dissemination of Research findings

Findings of this study was shared during defense of this thesis to the school of graduate studies of Masinde Muliro University of Science and Technology and then through three publications in peer reviewed journals. First and second publications were on baseline review of resources supporting CCS in Kakamega County and survey on knowledge, attitude and practices on cervical cancer screening among eligible women respectively. Third publication will be on the effect of individualized health education on the uptake of CCS in the County. It will also be presented in scientific conferences and workshops globally. The national and county governments can use the findings to formulate policies on cervical cancer screening that will improve maternal health indicators. Further, it is useful to researchers to find more solutions to cervical cancer burden and put in use community strategy in addressing other issues of public health concern. The researcher can present a proposed model Community Strategy incorporating Cervical Cancer Screening.

3.12 Logistical and Ethical Consideration

The researcher observed the four principles of ethics which included: Beneficence, Non-maleficence, justice, and Autonomy (Vanclay, Bianes, & Taylor, 2013). Approval of the study was sought from the Institutional Ethical Review Committee of Masinde Muliro University of Science and Technology and National Commission for Science, Technology, and Innovation. Permission to survey in Kakamega County was sought through research and an ethical review committee of the County, the eighteen Sub-County Medical Officer of Health (SCMOH). The study observed five universal ethical principles, including respect for participants, beneficence, justice, confidentiality, and informed consent. The study was conducted by a qualified researcher and reviewed by competently qualified supervisors who ensured all steps were followed. **Beneficence;** the researcher recognized participant's intrinsic values and had the obligation to act for the benefit of the participant and removed conditions that would cause harm. Any benefit from the study was shared to all participants in both groups without undermining the integrity of the study. Participants who screened positive for cervical cancer were referred to the gynecologist for further review and treatment. Women who requested to be screened but were not in the study were screened. Participants in control group also received similar health education on aspects of cervical cancer screening at the end of the study so that they benefit from the intervention. **Non-maleficence;** there was no harm caused to any participant, whether physical, psychological, social, and economic. Local research assistants were used in this study to prevent social, emotional, and psychological issues related to culture. No exploitation was practiced on a participant to benefit the researcher. Any benefits and risks were shared by the client so that she makes her own decision on whether to participate in the study or not without any cohesion. Those who opted out would do so without loss of

any benefit or required care. Unforeseen risks and guarantee of anonymity, benefits, and compensation or lack of them were explained to the respondents. As human beings, they were guaranteed freedom from harm psychologically and physically as there was no test to be done. There was freedom from exploitation as the information collected was to be used to improve health. **Justice;** the researcher observed dignity by ensuring a fair process of recruitment by simple random sampling, to ensure no participant exploitation but instead actively protect participant well-being by anonymity on questionnaires and used the shortest time possible to answer questions. The results from the study would be revealed and disseminated transparently despite the outcome of the research. The benefits of the research would be shared with all stakeholders. Those in the control group also received a similar intervention after the post intervention questionnaire. This was to ensure that all study participants get the benefits of the intervention. **Privacy and confidentiality;** information given by the participant was kept confidential and anonymous. The respondents were free to ask questions for clarification where necessary and privacy was maintained. All data collected from the participant was kept confidential, under key and lock by the researcher and only shared by concerned research parties. **Autonomy;** participants signed an informed consent; **t**he participants read and understood or were explained to all the contents of informed consent to include: the title of the study, principal investigator's name and contacts, the purpose of the study, procedures to be followed, risks and benefits of the study, confidentiality of the information given and voluntary conditions to participate. The participants came up with an informed decision on whether to participate or not. Participants who decided to participate then sign or put a fingerprint to verify that she willingly accepted to respond to the questions on the questionnaire. The study participants were free to sign an informed consent. Each study participant was

explained that he/she had a right to participate or not without losing their human rights (***Appendix II).***

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of the available human resource

Table 4.1 shows socio-demographic characteristics of CHVs described in terms of gender, age group, level of highest education attained, marital status and number of years of experience worked as a community health volunteer. CHVs are a potential human resource within Community Health Strategy that is currently being used to implement safe motherhood. They play a critical role in integrating CCS in CHS. Over 91% of CHVs were female aged 41 - 50 years (42%), which reflected the proportion of male and female in the general population of CHVs. About 48% of CHVs had primary education as the highest level of education while 39% of participants had post primary education. Almost all the CHV were married, living together with their spouses, and had worked for more than five years as community health volunteers.

Table 4.1: Demographic characteristics of the community health volunteers

Characteristic (N=48)	**Frequency (%)**
Gender	
Female	44 (92)
Male	4 (8)
Age group	
20-30 years	8 (16)
31-40 years	16 (33)
41-50 years	20 (42)
Over 50 years	4 (8)
Level of education	
Informal	6 (13)
Primary	23 (48)
Post primary	19 (39)
Marital status	
Single	2 (4)
Married/Living together	39 (81)
Divorced/separated	2 (4)
Widowed	5 (10)
Years of experience	
Less than 5 years	19 (40)
Over 5 years	29 (60)

Data are presented as frequencies (n) and percentages (%).

4.2 Socio demographic characteristics of women participants

Table 4.2 shows the sociodemographic characteristics of women in Control and Intervention groups. A total of 872 women participated in the study at baseline of which, 432 were in intervention and 440 in control group. During the 6 months follow up, 617 participants were traced and interviewed; 295 (73 percent) from intervention and 322 (68 percent) from control group giving an overall retention rate of 71 percent. A Chi-square test of independence was used to analyze the association of data on the sociodemographic characteristics of women between Control and Intervention groups at baseline and follow up. The mean age of participants at baseline for both intervention and control group was 34.0 SD± 7.4 and 34.2 SD± 7.1 respectively. Most participants were married and living together with the spouses (control=88 percent and intervention=90 percent). Majority of participants had primary level education (control=86 percent intervention=82 percent), slightly above average were housewives (control=59 percent, intervention=49 percent). Most of participants were members of the African Independent Churches (control=70 percent, intervention=59 percent). The mean number of children per woman in control and intervention groups was 4.0 (SD±2.2) (0 - 16) and 3.9 (SD±2.2) (0 - 16). Chi square analysis of data collected at baseline, had no significant difference in the socio-demographic characteristics between intervention and control groups with the exception that more women in the control group were African independent church faithful ($p<0.05$) and housewives ($p<0.05$). Most participants stayed less than 5 kilometers from the link health facilities (control=54 percent, intervention=58 percent). Over 80 percent of participants in both Control and intervention group had stayed in the county for over 16 years ($p>0.05$).

Table 4.2 Sociodemographic characteristics of women in control and intervention group

Characteristic		Control Frequency (%)	Intervention Frequency (%)	p-value
Age (years)	25-29	149 (34)	142 (33)	0.84
	30-34	102 (23)	97 (22)	
	35-39	72 (16)	77 (18)	
	40-44	64 (14)	71 (16)	
	45-49	53 (12)	45 (10)	
	Mean age	34.0±7.4	34.2±7.1	0.65
Marital status	Single/never married	15 (3)	15 (3)	0.11
	Married/living together	389 (88)	387 (90)	
	Divorced/separated	8 (2)	15 (3)	
	Widowed	28 (6)	15 (3)	
Religion	Catholic	31 (7)	51 (12)	**0.01**
	Protestants	85 (20)	120 (28)	
	African independent churches	308 (70)	257 (59)	
	Muslim	13 (3)	4 (1)	
Education level	Informal	200 (45)	175 (41)	0.18
	Primary	178 (41)	179 (41)	
	Post primary	62 (14)	78 (18)	
Occupation	House wife	262 (59)	213 (49)	**0.02**
	Small business	63 (14)	86 (20)	
	Farmer	91 (21)	102 (24)	
	Other	24 (6)	31 (7)	
Number of births	No live births	12 (3)	9 (2)	0.67
	1-3 live births	184 (42)	191 (44)	
	Over 3 live births	244 (55)	232 (54)	
Mean number of births		4.0±2.2	3.9±2.2	**0.04**
Length of stay in Kakamega	1-15 years	77 (18)	69 (16)	0.19
	16-30 years	181 (41)	158 (37)	
	Over 30 years	182 (41)	205 (47)	
Distance from home to health facility	5 or less kilometers	104 (54)	120 (58)	0.41
	>5 kilometers	89 (46)	87 (42)	

Data are presented as frequencies (n) and percentages (%). Continuous variables were analyzed using students t-test, Age and births are presented as mean (standard error of the mean). Analysis was done using Chi-square test, $P< 0.05$ considered significant. Values in bold are significant *P*-values.

4.3 Available human resource factors

Table 4.3 shows human resource factors. It describes the proportions of CHVs in terms of their modes of contacting women in the village, their frequency of visiting households, and involvement in awareness creation on CCS, previous training on CCS and whether they have messages on CCS for women. This information was important to assess the

CHV's potential to create awareness on CCS among women. Almost all CHVs (96%) had scheduled home visits as a mode of contacting their clients in the community. Three quarters (77 percent) of CHVs had monthly scheduled home visits. More than 60% of CHVs said that their work involved sensitizing women on CCS, however, almost all CHVs (92%) had never been trained on any aspect related to CCS. Further, 94% of CHVs stated that issues on cervical cancer screening is not included in the work manual provided by the Ministry of Health.

Table 4.3: Human resource factors

Characteristics (N=48)	Frequency (%)
Mode of contacting clients	
Home visit on request of client	2 (4)
Scheduled Home visit	46 **(96)**
Frequency of visiting each household	
Weekly	9 (19)
Monthly	37 **(77)**
Only when needed	2 (4)
Involvement as CHV in sensitizing women on cervical cancer and screening	
Yes	29 **(60)**
No	19 (40)
Trained on cervical cancer screening	
Yes	4 (8)
No	44 **(92)**
Cervical cancer screening issues included in health messages for women	
No	45 **(94)**
Yes	3 (6)

Data are presented as frequencies (n) and percentages (%).

4.4 Health facility related factors supporting cervical cancer screening

Table 4.4 shows health facility related factors that support CCS in the County. This table describes the proportions of Health Facilities (HF) in terms of type of HF, whether they offer CCS, have referral forms to refer cervical cancer clients, training approach required to improve staff on CCS, and their frequency of conducting outreach services for CCS. This information was important to assess the capacity of Health facilities to conduct CCS

within the respective catchment areas. A total of 16 heads of Health Facility (HFH) participated in the study out of which 81 percent were health centers. Majority of the health facilities (75 percent) offered cervical cancer screening services on a particular day per week. Approximately 63 percent of health facilities had a referral form to refer cervical cancer patients. About 94 percent of link-health facilities conducted outreach services for cervical cancer screening monthly. Table 4.4 below gives a summary of the responses.

Table 4.4: Facility related factors supporting cervical cancer screening

Characteristics	Frequency (%)
Type of health facility	
County hospital	1 (6)
Sub county hospital	2 (13)
Health center	13 **(81)**
Cervical cancer screening offered	
No	4 (25)
Yes	12 **(75)**
Availability of referral forms to refer cervical clients	
Available	10 **(63)**
Not available	6 (37)
Training required to improve staff on CCS	
A practical training	14 **(87)**
Theoretical training	2 (13)
Frequency of conducting outreach services for CCS	
Monthly	11 **(68)**
After 3 months	2 (13)
After 6 months	1 (6)
Annually	2 (13)

Data are presented as frequencies (n) and percentages (%).

4.5 Baseline and follow up awareness of Cervical Cancer

Table 4.5 shows awareness of Cervical Cancer and the sources of this information among the participants in both groups. A Chi-square test was used to analyze the association of data on the awareness of Cervical Cancer and source of information among women between Control and Intervention groups. There was no significant difference between control and intervention groups regarding ever having heard of cervical cancer screening. Their main sources of information was media (Intervention = 47%; Control = 49%) and

Health Care Workers (Intervention = 33 percent: Control = 32 percent), p>0.05. During follow up, participants in the intervention group were significantly more aware of cervical cancer than those in the control group (p<.05). Participants who had heard of cervical cancer in the intervention group were significantly more (96 percent) than those in control group (63 percent) (p<0.05). Significantly more participants in the intervention group than in the control group had CHVs as their main source of information (95%), p< 0.05.

Table 4.5 Baseline and follow up awareness of Cervical Cancer

Characteristic	Baseline		p-value	Follow up		p-value
	Control	Intervention		Control	Intervention	
	Frequency (%)	Frequency (%)		Frequency (%)	Frequency (%)	
Heard of cervical cancer						
No	98 (22)	71 (16)	**0.06**	119 (37)	11 (4)	**0.01**
Yes	342 (78)	361 (84)		203 (63)	284 (96)	
Source of information						
Media	169 (49)	171(47)	0.28	7 (3)	6(2)	**0.01**
Friends	50 (15)	67 (18)		81 (40)	3 (1)	
HCW	110 (32)	119 (33)		113 (55)	6 (2)	
CHVs	14 (4)	8 (2)		3 (2)	269 (95)	

Data are presented as frequencies (n) and percentages (%).

4.6 Baseline and follow up knowledge factors on signs of cervical cancer

Table 4.6 shows knowledge factors on signs of CC in control and intervention groups at baseline and during follow up. A Chi-square test was used to analyze the association of data on the knowledge of signs of cervical cancer among women between Control and Intervention groups. At baseline, there was no significant difference in the knowledge of signs and symptoms of CC between intervention and control group (p>0.05)". The knowledge on various signs and symptoms of CC in both groups ranged from 46 percent to 60 percent. During follow up, significantly more participants in the intervention than in the control group knew the signs of cervical cancer (p<0.05). For instance, for vaginal bleeding between periods (50 percent versus 94 percent), persistent lower back pain (49

percent versus 92 percent), persistent vaginal discharge that smells unpleasant (37 percent versus 94 percent), discomfort or pain during sex (34 percent versus 94 percent), menstrual periods that are heavier or longer than usual (35 percent versus 92 percent), persistent diarrhea (32 percent versus 86 percent), vaginal bleeding after the menopause (35 percent versus 92 percent), persistent pelvic pain (39 percent versus 95 percent), vaginal bleeding during or after sex (39 percent versus 94 percent), blood in the stool or urine (35 percent versus 86 percent), and unexplained weight loss (39 percent versus 88 percent). When asked about women at most risk for cervical cancer, majority of participants in both intervention (39 percent) and control (47 percent) communities at baseline said that cervical cancer is not related to age (p value >0.05). Other commonly mentioned groups of women at most risk for cervical cancer were women aged 21 to 49 years (Intervention = 25%, Control=28 percent), p value>0.05. However, during follow up, significantly more participants in the intervention group (90 percent) than in the control group (21 percent) said that women aged 21 to 49 were at more risk of developing cervical cancer ($p<0.05$).

Table 4.6: Baseline and follow up knowledge factors on signs of cervical cancer

Characteristic	Baseline			Follow up		
	Control	Intervention	p-value	Control	Intervention	p-value
	Frequency (%)	Frequency (%)		Frequency (%)	Frequency (%)	
Knew that vaginal bleeding between periods is a sign of cervical cancer						
No	183 (53)	198 (54)	0.96	101 (50)	16 (6)	**0.01**
Yes	159 (47)	165 (46)		102 (50)	268 (94)	
Knew that persistent lower back pain is a sign of cervical cancer						
No	231 (68)	263 (73)	0.32	103 (51)	21 (8)	**0.01**
Yes	111 (32)	100 (27)		100 (49)	263 (92)	
Knew that persistent vaginal discharge that smells unpleasant is a sign of cervical cancer						
No	143 (42)	151 (42)	0.22	128 (63)	17 (6)	**0.01**
Yes	199 (58)	211 (58)		75 (37)	267 (94)	
Knew that discomfort or pain during sex is a sign of cervical cancer						
No	161(47)	167 (46)	0.97	135 (66)	17 (6)	**0.01**
Yes	181(53)	195 (54)		68 (34)	267 (94)	
Knew that menstrual periods that are heavier or longer than usual is a sign of cervical cancer						
No	214 (63)	215 (59)	0.24	131 (65)	22 (8)	**0.01**
Yes	128 (37)	147 (41)		72 (35)	262 (92)	
Knew that persistent diarrhea is a sign of cervical cancer						
No	304 (89)	319 (88)	0.89	139 (68)	38 (14)	**0.01**
Yes	38(11)	42 (12)		64 (32)	246 (86)	
Knew that vaginal bleeding after the menopause is a sign of cervical cancer						
No	159 (46)	144 (40)	0.21	131 (65)	23 (8)	**0.01**
Yes	183 (54)	217 (60)		72 (35)	261 (92)	
Knew that persistent pelvic pain is a sign of cervical cancer						
No	183 (54)	168 (47)	0.17	124 (61)	13 (5)	**0.01**
Yes	159 (46)	193 (53)		79 (39)	271 (95)	
Knew that vaginal bleeding during or after sex is a sign of cervical cancer						
No	160 (47)	163 (45)	0.84	123 (61)	18 (6)	**0.01**
Yes	182 (53)	198 (55)		80 (39)	266 (94)	
Knew that blood in the stool or urine is a sign of cervical cancer						
No	260 (76)	248 (69)	0.09	132 (65)	38 (14)	**0.01**
Yes	82 (24)	113 (31)		71 (35)	246 (86)	
Knew that unexplained weight loss is a sign of cervical cancer						
No	249 (73)	267 (73)	0.28	124 (61)	35 (12)	**0.01**
Yes	93 (27)	99 (27)		79 (39)	249 (88)	

Data are presented as frequencies (n) and percentages (%). Analysis was done using Chi-square test, $P< 0.05$ considered significant. Values in bold are significant *P*-values.

4.7 Chi-square analysis between control and intervention group on Knowledge about risk factors for developing cervical cancer at baseline and follow up

Table 4.7 shows the result on knowledge about risk factors for developing cervical cancer among participants. A chi-square test of independence was performed to examine the relation between control and intervention groups on knowledge about risk factors for developing cervical cancer at baseline and during follow up. At baseline, participants in intervention and control group did not differ significantly on the level of agreement to the listed risk factors for developing cervical cancer, except in the following; long term use of contraceptive pill and not going for regular cervical screen tests (Table 4.7). This significant difference is likely to have been random because selection and allocation of groups was random. During follow up, significantly more participants in the intervention group than in the control group knew the various risk factors for developing cervical cancer ($p< 0.05$). For instance, control versus intervention, significantly more participants in the intervention group knew that the following are risk factors for cervical cancer; infection with Human Papilloma Virus (82% versus 97%), smoking any cigarette at all (58% versus 95%), having a weakened immunity (41% versus 92%), long term use of contraceptive pill (55% versus 93%), infection with chlamydia (29% versus 89%), having a sexual partner who is not circumcised (37% versus 93%), starting to have sex before age 17 (40% versus 92%), having many sexual partners (40% versus 90%), having many children (38% versus 87%), having a sexual partner with many previous partners (35% versus 86%), and not going for regular cervical screen tests (45% versus 92%).

Table 4.7: Chi-square analysis between control and intervention group on knowledge about risk factors for developing cervical cancer at baseline and follow up

Factor	Baseline			Follow up		
	Control Frequency (%)	Intervention Frequency (%)	p-value	Control Frequency (%)	Intervention Frequency (%)	p-value
Knew that infection with Human Papillomavirus is a risk						
Disagree	33 (10)	19 (8)	0.07	27 (18)	9 (3)	**0.01**
Agree	309 (90)	333 (92)		176 (82)	275 (97)	
Knew that smoking any cigarettes at all is a risk						
Disagree	81 (24)	86 (24)	0.13	86 (42)	15 (5)	**0.01**
Agree	261 (76)	275 (76)		117 (58)	269 (95)	
Knew that having a weakened immune is a risk						
Disagree	56 (16)	73 (20)	0.15	119 (59)	24 (8)	**0.01**
Agree	286 (84)	288 (80)		84 (41)	260 (92)	
Knew that long term use of contraceptive pill is a risk						
Disagree	46 (14)	39 (11)	**0.04**	92 (45)	21 (7)	**0.01**
Agree	306 (86)	322 (89)		111 (55)	263 (93)	
Knew that infection with Chlamydia is a risk						
Disagree	41(12)	42 (12)		144 (72)	32 (11)	**0.01**
Agree	301 (89)	319 (88)		59 (29)	252 (89)	
Knew that having a sexual partner who is not circumcised is a risk						
Disagree	199(58)	183 (51)	0.15	126 (63)	23 (7)	**0.01**
Agree	143 (42)	178 (49)		77 (37)	261 (93)	
Knew that starting to have sex before age 17 is a risk						
Disagree	40 (11)	39 (11)	0.25	121 (59)	22 (8)	**0.01**
Agree	292 (89)	322 (89)		82 (40)	262 (92)	
Knew that having many sexual partners is a risk						
Disagree	38 (11)	43 (12)	0.21	122 (60)	28 (10)	**0.01**
Agree	304 (89)	318 (88)		81 (40)	256 (90)	
Knew that having many children is a risk						
Disagree	147 (43)	152 (42)	0.81	127 (63)	36 (13)	**0.01**
Agree	195 (57)	209 (58)		76 (38)	248 (87)	
Knew that having a sexual partner with many previous partners is a risk						
Disagree	84 (25)	91 (25)	0.05	132 (65)	39 (14)	**0.01**
Agree	258 (75)	270 (75)		71 (35)	245 (86)	
Knew that not going for regular cervical screen tests is a risk						
Disagree	73 (21)	99 (27)	**0.01**	112 (55)	24 (8)	**0.01**
Agree	269 (79)	262 (73)		91 (45)	260 (92)	

Data are presented as frequencies (n) and percentages (%). Analysis was done using Chi-square test, $P< 0.05$ considered significant. Values in bold are significant *P*-values.

4.8 Mean knowledge and attitude scores for cervical cancer

Table 4.8 shows mean score of knowledge and attitude towards cervical cancer screening among participants. A chi-square test of independence was performed to examine the relation between control and intervention groups on mean knowledge and attitude scores for cervical cancer at baseline and during follow up. This information was important to inform on the overall change in mean score of knowledge and attitude among women after the intervention. At baseline, mean knowledge score about signs of cervical cancer and mean attitude score towards cervical cancer screening were not significantly different between control and intervention group ($p>0.05$). However, during follow up, significant difference was observed between control and intervention group in respect to mean knowledge score about signs of cervical cancer (4.2 versus 10.1), ($p<0.01$), knowledge score about risk factors for developing cervical cancer (4.3 versus 9.9) ($p<0.01$), and attitude score about cervical cancer screening (8.4 versus 11) ($p<0.01$).

Table 4.8: Mean score of knowledge of and attitude towards cervical cancer

Variable	Baseline control	Intervention	p-value	Follow up Control	interventi on	**p-value**
Mean knowledge score about signs of cervical cancer	4.4	4.6	0.42	4.2	10.1	**0.01**
Mean knowledge score about risk factors for cervical cancer	5.1	5.6	0.07	4.3	9.9	**0.01**
Mean attitude score towards cervical cancer screening	6.9	7.0	0.35	8.4	11	**0.01**

Data are presented as mean scores. Analysis was done using a paired t test, $P< 0.05$ considered significant. Values in bold are significant *P*-values.

4.9 Chi-square analysis between control and intervention groups on knowledge level on signs and risk factors for cervical cancer at baseline and follow up

Table 4.9 shows knowledge level on signs and knowledge level on risk factors for CC and attitude rating towards Cervical Cancer. A Chi-square test was used to analyze the association of data on the knowledge level on signs of and risk factors for cervical cancer

between control and intervention groups. At baseline, majority of participants in both control and intervention groups had poor knowledge level about signs of cervical cancer, (control=53%, intervention=46%), $p>0.05$ and poor knowledge level about risk factors for cervical cancer (control=59%, intervention=57%) $p>0.05$. The two groups were not significantly different in terms of knowledge level for signs and risk factors. Most participants had a positive attitude towards cervical cancer screening at baseline and at follow up. There was no significant difference between the two groups on attitude level at both baseline and follow up. During follow up, significantly more participants in the intervention groups (88%) and (84%) than control groups (7%) and (10%) had good knowledge level on both signs of cervical cancer and risk factors for developing cervical cancer respectively ($p < 0.05$). Similarly, there were strongly significantly more participants with a positive attitude in the intervention (11%) than in the control (3%) groups ($p<0.05$).

Table 4.9: Chi-square analysis between control and intervention groups on knowledge level on signs and risk factors for cervical cancer at baseline and follow up

Attribute	Baseline			Follow-up		
	Control	**Intervention**	**p-value**	**Control**	**Intervention**	**P-value**
	Frequency (%)	**Frequency (%)**		Frequency (%)	Frequency (%)	
Knowledge about signs of cervical cancer						**0.01**
Poor	180 (53)	165 (46)	0.06	125 (62)	11 (4)	
Moderate	117 (34)	127 (35)		63 (31)	24 (8)	
Good	45 (13)	69 (19)		15 (7)	249 (88)	
Knowledge about risk factors for cervical cancer						**0.01**
Poor	201 (59)	207 (57)	0.70	132(65)	8 (3)	
Moderate	102 (30)	105 (29)		53(26)	37 (13)	
Good	39 (11)	49 (14)		18(10)	239 (84)	
Attitude towards cervical cancer screening						**0.06**
Positive	280 (82)	269 (74)	0.07	197 (97)	254 (89)	
Negative	62 (18)	92 (26)		6 (3)	30 (11)	

Data are presented as frequencies (n) and percentages (%). Analysis was done using Chi-square test, $P< 0.05$ considered significant. Values in bold are significant *P*-values.

4.10 Chi-square analysis between control and intervention groups on perception about screening for cervical cancer at baseline and during follow up

Table 4.10 shows the perceptions of participants about screening for cervical cancer. A chi-square test of independence was performed to examine the relation between control and intervention groups on perception about screening for cervical cancer at baseline and during follow up. At baseline, perceptions of participants about screening for cervical cancer did not differ significantly between intervention and control group. Within both control and intervention group, between 46 percent to 93 percent participants perceived that; it is possible to detect cervical cancer early by screening, any female should be screened for cervical cancer and that they were at risk for cervical cancer. About 80 percent participants in both communities perceived that a positive result meant presence of cervical cancer ($p>0.05$). The analysis of data collected during follow up revealed that

significantly more women in the intervention (94 percent) than in the control (65 percent) groups agreed that it is possible to detect cervical cancer early by screening (p< 0.01), a positive result does not mean presence of cervical cancer (control =94%, intervention= 20 percent) p< 0.01, and that they are at risk for cervical cancer (control=72 percent, intervention=97 percent) p< 0.01.

Table 4.10: Baseline and follow up perceptions about screening for cervical cancer

Attribute	Baseline			Follow up		
	Control	Intervention	p-value	Control	Intervention	p-value
	F (%)	F (%)		F (%)	F (%)	
Cervical cancer can be detected early by screening			0.07			**0.01**
No	21 (6)	37 (10)		15 (7)	5 (2)	
Yes	264 (77)	278 (77)		132 (65)	**267 (94)**	
Don't know	57 (17)	46 (13)		56 (28)	12 (4)	
Eligible person to get screened for cervical cancer			0.88			
Married women	12 (5)	11 (4)		2 (2)	3 (1)	0.13
Unmarried women	2 (1)	1 (0.4)		4 (3)	1 (0.4)	
Sex workers	9 (3)	8 (3)		2 (2)	2 (1)	
Any female	241 (91)	259 (93)		124 (94)	261 (98)	
A positive result mean presence of cervical cancer			0.82			
No	26 (10)	26 (9)		4 (3)	213 **(79)**	**0.01**
Yes	212 (80)	221 (79)		124 (94)	53 (20)	
Do not know	26 (10)	32 (12)		4 (3)	2 (1)	
You are at risk for cervical cancer			0.59			
No	82 (24)	83 (23)		19 (10)	6 (2)	**0.01**
Yes	166 (48)	166 (46)		147 (72)	**274 (97)**	
Do not know	94 (28)	112 (31)		37 (18)	4 (1)	

Data are presented as frequencies (n) and percentages (%). Analysis was done using Chi-square test, *P*< 0.05 considered significant. Values in bold are significant *P*-values.

4.11 Reasons given for not screening among those who did not go for cervical cancer screening at baseline and follow-up

Table 4.11 shows various reasons given by participants who had never screened for cervical cancer in control and intervention groups for not screening at baseline and during follow up. Participants who had never been screened before were asked to identify reasons

why they had never been screened. A Chi-square test was used to analyze the association of data on the reasons given for not screening for CC between the two groups. From the table, majority of participants in both intervention (30 percent) and control (42 percent) communities at baseline, said that screening was for those with obvious signs and symptom (p>0.5), while some said that they had never been told to go for screening (control=33 percent, intervention=41 percent), (p> 0.5). During follow up, majority of participants (control=15 percent and 22 percent, intervention=38 percent and 30 percent) said that they were afraid of the results respectively (p< 0.01).

Table 4.11: Reasons given for not screening among those who did not go for cervical cancer screening at baseline and follow-up

Characteristic	Baseline			Follow up		
	Control (N=268)	Intervention (282)	p-value	Control (142)	Intervention (120)	p-value
	F (%)	F (%)		F (%)	F (%)	
Distance	16 (6)	15 (5.3)	0.18	5 (4)	4 (3)	**<0.01**
Cost	7 (3)	9 (3.2)		2 (1)	3 (2)	
Busy	18 (7)	29 (10.3)		32 (22)	37(30)	
For married women	1 (4)	0		1 (7)	0	
It is for those with obvious signs and symptoms	114 (42)	86 (30)		42 (30)	7 (6)	
Husband against	1 (4)	0		2 (1)	2 (2)	
Afraid of the result	10 (4)	11 (4)		22 (15)	47 (38)	
Fear of vaginal examination	9 (3)	13 (5)		1 (7)	12 (10)	
Test is uncomfortable	3 (1)	4 (1)		3 (2)	8 (7)	
Never been told to screen	89 (33)	115 (41)		32 (22)	2 (2)	

Data are presented as frequencies (n) and percentages (%).

4.12 Chi-square analysis between control and intervention groups on access to and practice of cervical screening at baseline and during follow up

Table 4.12 shows the access to and practice of cervical cancer screening among participants in control and intervention groups at baseline and during follow up. In this table, a woman's accessibility to CCS was assessed by asking her five questions; if the CHV within her village visits her; if CHV ever talks to the woman about CCS, and if she

knows of a facility near her home that performs CCS. The woman is also asked about her willingness to screen after an explanation of CCS, and how soon she could go for screening if she decides to screen. Uptake or practice of CCS was asked by one question; at baseline, if the woman has ever gone for CCS, and during follow up if the woman has ever gone for CCS in the past six months. A Chi-square test was used to analyze the association of data on the access to and practice of cervical screening between control and intervention groups at baseline and after implementation. At baseline, there was no significant difference between control and intervention groups on access and practice of CCS. Approximately 84 percent of participants in both groups had been visited by a CHV ($p>0.05$). Among those who had ever heard of cervical cancer, about 57 percent in both groups knew of a health facility near their homes that screened cervical cancer ($p>0.05$). Approximately 22 percent of participants in both groups had been screened for cervical cancer previously ($p>0.05$). Among those who had never been screened, 94 percent and 98 percent of participants in the intervention and control groups respectively were willing to be screened if explained to them. Majority of participants in intervention (59 percent) and control (65 percent) groups would go for screening after 6 months. During follow up, significantly more participants in the intervention group; had discussed with the CHV about CCS; knew of a health facility that screened cervical cancer (control=89 percent, intervention=98 percent) $p< 0.05$; and screened for cervical cancer in the past six months (control=31 percent, intervention=58 percent) $p< 0.05$.

Table 4.12: Baseline and follow up access to and practice of cervical screening

Attributes	Baseline			Follow up		
	Control	Intervention	p-value	Control	Intervention	p-value
	F (%)	F (%)		F (%)	F (%)	
Woman visited by a CHV in the last 12 months			0.95			
No	73 (17)	71 (16)		11 (3)	4 (1)	1.00
Yes	367 (83)	361 (84)		311 (97)	291 (99)	
CHV discussed with woman about cervical cancer						
No	228 (78)	261 (85)	0.08	187 (94)	9 (3)	**0.01**
Yes	63 (22)	46 (15)		12 (6)	272 (97)	
Knows of a health facility near home that screens for cervical cancer						
No	149 (44)	154 (43)	0.81	23 (11)	5 (2)	**0.01**
Yes	193 (56)	207 (57)		180 (89)	279 (98)	
Been screened for cervical cancer						
No	267 (78)	282 (78)	0.99	141 (69)	119 (42)	**0.01**
Yes	75 (22)	79 (22)		62 (31)	163 (58)	
If you were explained, will you be willing to do the test						
No	4 (2)	18 (6)	0.06	3 (2)	6 (5)	0.47
Yes	264 (98)	264 (94)		139 (98)	116 (95)	
How soon will you be willing to screen cervical cancer						
< 6 months	179 (41)	152 (35)	0.09	137 (31)	115 (27)	0.14
6 and more months	261 (59)	280 (65)		303 (67)	317 (73)	

Data are presented as frequencies (n) and percentages (%). Analysis was done using Chi-square test, $P< 0.05$ considered significant. Values in bold are significant *P*-values.

4.13 Bivariate analysis of factors associated with uptake of Cervical Cancer Screening

Table 4.13 shows the factors associated with the uptake of CCS. To determine factors that were associated with uptake of cervical cancer screening, a binary logistic regression was conducted. Factors that could influence the uptake of screening were selected based on information, from literature, previous studies and from researcher's own intuition. At bivariate level, each factor was entered into a regression model and determined if they were significantly associated with cervical screening uptake at a p-value of 0.05. These factors were then entered into multiple logistic regression to obtain factors that were

independently associated with uptake of cervical cancer screening after controlling for covariates.

Table 4.13: Bivariate analysis of factors associated with uptake of CCS

Variable	OR	95%CI		p-value
		Lower	Upper	
Marital status				
Married/cohabiting				Ref
Single (divorced/widowed/never married)	1.688	.965	2.953	.066
Length of stay in Kakamega in years				
1-15				Ref
16-30	2.005	1.165	3.452	**.012**
Over 30	1.581	.931	2.684	.090
Women's sources of information about CCS screening				
Media				Ref
Friends	1.394	.807	2.410	.234
Healthcare worker/provider	1.710	1.118	2.615	**.013**
Community health volunteer	1.230	.399	3.790	.718
How soon women said they would go for CCS if they had information				
Less than six months				Ref
More than six months	2.042	1.415	2.947	**<0.001**
Women's knowledge of CC risk factors				
Poor				Ref
Moderate	1.558	.943	2.574	.083
Good	2.500	1.059	5.904	**.037**
Intervention arm				
Control				Ref
Intervention	3.108	2.125	4.546	**<0.001**
Discussed CCS with CHV during visit				
Did not discuss				Ref
Discussed	3.381	2.294	4.984	**<0.001**

Analysis was done using multivariate logistic regression. OR; Odds Ratio, 95% CI; confidence interval, Ref; Reference variable, $P< 0.05$ considered significant. Values in bold are significant *P*-values.

At bivariate level, the factors that either showed a trend or were significantly associated with increased likelihood of uptake of CCS were: being single OR 1.69 (95% confidence interval (CI): 0.96-2.95, p=0.07); having stayed in Kakamega for between 16-30 years OR 2.00 (95% CI: 1.16-3.45, p=0.01); women reporting source of information on CCS being healthcare worker OR 1.71 (95% CI: 1.12-2.61, p=0,01); women reporting to take more than six months to go for CCS if they were given information about CCS OR 2.04 (95% CI: 1.41-2.91, p <0.01); women having moderate knowledge of risk factors for cervical cancer OR 1.56 (CI: 0.94-2.57, p=0.08); women having good knowledge of risk factors

for cervical cancer OR 2.50 (95% CI: 1.06-5.90, p=0.04); women enrolled from intervention group OR 3.11 (95% CI: 2.12-4.55, p <0.01) and women who reported discussing CCS with CHVs OR 3.38 (95% CI: 2.29-4.98, p <0.01).

4.14 Multivariate analysis of factors independently associated with uptake of cervical cancer screening

Table 4.13 shows factors independently associated with uptake of CCS. All factors that either showed a trend or were significantly associated with uptake of CC screening in the bivariate model (see table 4.12) were entered in a multivariate model to establish factors independently associated with uptake of CC screening after controlling for others. In this multivariate model, only three factors namely marital status, source of information about CCS and whether CHVs discussed with women about CCS during their visit were independently associated with uptake of CCS. Women who were single (never married, separated, widowed) were two times more likely to go for CC screening compared to married/cohabiting women (AOR 2.2 [95% CI: 2.14-4.29, p=0.02]). Similarly, women who reported to get information about CC screening from healthcare workers/providers were 1.8 times more likely to go for CC screening compared to those who received information about CC screening through media (AOR 1.82 [95% CI: 1.14-2.88, p=0.01]). Also, women who reported to get information about CC screening from community health volunteers were 1.4 times more likely to go for CC screening compared to those who received information about CC screening through media (AOR 1.44 [95% CI: 1.42-4.93, p=0.05]). Lastly, women who reported to discuss about CC screening with CHV during visit were more than four times likely to go for CC screening compared to women who did not (AOR 4.21 [95% CI: 2.73-6.51, p<0.01).

Table 4.14: Multivariate analysis of factors independently associated with uptake of cervical cancer screening

Variable	AOR	95%CI		p-value
		Lower	Upper	
Marital status				
Married/cohabiting				Ref
Single (divorced/widowed/never married)	2.212	1.140	4.294	**.019**
Length of stay in Kakamega in years				
1-15				Ref
16-30	1.319	.705	2.467	.387
Over 30	1.134	.617	2.084	.685
Women's sources of information about cervical cancer screening				
Media				Ref
Friends	1.183	.657	2.129	.576
Healthcare worker/provider	1.816	1.143	2.884	**.011**
Community health volunteer	1.443	1.423	4.925	**.048**
Attitude towards cervical cancer screening				
Poor attitude				Ref
Good attitude	.551	.278	1.093	.088
Women's knowledge of cervical cancer risk factors				
Poor				Ref
Moderate	1.430	.825	2.477	.202
Good	2.031	.802	5.143	.135
Discussed CCS with CHV during visit				
Did not discuss				Ref
Discussed	4.215	2.730	6.508	**<0.01**

Analysis was done using multivariate logistic regression. AOR; Adjusted Odds Ratio, 95% CI; confidence interval, Ref; Reference variable, $P< 0.05$ considered significant. Values in bold are significant *P*-values.

CHAPTER FIVE

DISCUSSION

5.1 Resources supporting CCS in public health facilities

5.1.1 Human resources related factors supporting CCS

Majority of the CHVs in the study were female aged 41 - 50 years who had scheduled home visits as a mode of contacting their clients in the community. Usually, majority of CHVs in the country are female. This reflects the proportion of gender representation among CHVs in the general population. This is demonstrated in a study done by Aseyo *et al.,* (2018) on Human resources for health in Kisumu. It was noted that 69 percent of CHVs were of female gender. Although most had already involved themselves in sensitizing women on CCS, they had never been trained on any aspect related to CCS. This demonstrates the willingness and potential of CHVs to be involved in CCS activities. Or perhaps it is as a result of task shifting in which case CHVs are filling gaps of staff shortage without adequate preparation. Most of the health facilities offered CCS services on a particular day per week. This is consistent with Community Health Worker Programme, (CHWP) in which community members are used to render certain primary health services to the community from which they come (Olaniran *et al.,* 2017); Lewin *et al.,* 2010). In most countries, lay health workers have only secondary education with no professional training, however they have the willingness to volunteer services, skill to communicate and acceptable to the community members. Because they live within the communities, they are familiar with the community environment and hence easily acceptable by community members during health promotion.

5.1.2 Health facility related factors affecting cervical cancer screening

Women were accessible to Health facilities for cervical cancer screening since majority of women stayed within 5 km radius of the health facility, almost all health facilities offered screening services weekly and outreach services every month. Further, health care workers had been trained on CCS and referral option was available for those cases which required senior review. This is supported by the conclusion made by Black *et al.,* (2019) in a systemic review of fourteen studies done in Uganda on views of Ugandan women and healthcare workers regarding barriers and facilitators for CCS. It was noted that women were less likely to go for CCS if they lived in rural arrears, lived far away from the health facilities, there was staff shortage or lack of equipment, long waiting time at health facility, staff are insensitive and lack CCS skills, and high transport and screening cost (Black *et al.,* 2019). Women residing in low socio-economic urban areas with few resources are not likely to receive timely cervical cancer screening however, they are more likely to be diagnosed with late-stage cancer (Ndejjo *et al.,* 2016; Black *et al.,* 2019). Inadequate access to CCS including insufficient screening services, not enough diagnostic facilities, poorly structured referral facilities/system, incomprehensive cancer surveillance system and lack of population based cancer registry leads to low screening uptake (Elizabeth *et al.,* 2012).

5.2 Knowledge, attitude and uptake of cervical cancer screening

5.2.1 Awareness and source of information about Cervical Cancer Screening

Most participants had ever heard about cervical cancer and their main sources of information at baseline was media especially radio and TV as well as from healthcare professionals at the health facilities. Having ever heard about cervical cancer was also

found to be high in other studies (Ajambo *et al.,* 2017), (Rosser *et al.,* 2015a), especially from radio, print media and healthcare professionals (Mukama *et al.,* 2017, Tapera *et al.,* 2017). This might be arising from the fact that the government has extensively sensitized people about CC through various modes of communication, especially radio/TV and healthcare workers. Given that majority of people have ever heard of cervical cancer, it shows that the current sources of information are adequate in reaching women on CCS. However, these sources have not been effective in changing screening behavior among women. This underscores the need to seek for complementary sources of information to back up the current sources whenever there is need to overcome cultural and attitudinal barriers. Tapera *et al.,* (2017) noted that the main source of information on CCS among students in Botswana was print media.

5.2.2 Knowledge level on Cervical Cancer Screening

Women had poor knowledge on aspects of CCS at baseline. This is consistent with findings by Ajambo *et al.,* (2017) and Tesfaye *et al.,* (2019) who observed that participants in Uganda and Ethiopia had insufficient knowledge about cervical cancer and its causes. During follow up, significantly more women became aware of CCS, signs of CC, and various risk factors for developing CC. The overall knowledge levels about signs of and risk factors for developing CC and attitude level towards CC significantly improved in the intervention groups than in control groups during follow up. Improvement in knowledge level on CCS during follow up was supported by a study done in Kenya on the effectiveness of Kenya's Community Health Strategy in delivering community-based maternal and newborn health care in Busia County (Wangalwa *et al.,* 2012) in which it was found that there was significant increase in the essential maternal and neonatal care

practices. Further, in a study done in Botswana by Tapera *et al.,* (2017), after health education, women knew that early sexual debut and smoking were the main risk factors for cervical cancer. Further, improvement of knowledge and attitude following health education was also reported by Latifa M. F. and Entisar A. E., (2014) in an interventional study done in Egypt when they noted that there was a significant improvement post intervention in all items of knowledge and attitude. However, unlike this study, it was done within Maternal and Child Health (MCH) centers. Naregal *et al.,* (2017) in India also noted that planned teaching program on CC was effective in improving knowledge of women. Adamu *et al.,* (2014) concluded that the delivery of health messages by Community Health Workers increased knowledge of maternal and newborn care among women in the local community and encouraged deliveries under skilled attendance. Health messages on CC can be packaged suited to be delivered by CHVs to women from within their homes. However, only a few of participants in the study knew the correct age for initial screening. Findings by Ajambo *et al.,* (2017) in a different study supported this, where almost none of the participants new the recommended age to do first CCS. According to WHO (Comprehensive Cervical Cancer Control; A guide to essential practice), CCS should commence at 25 years of age, (WHO, 2006). According to the Ministry of health, the government of Kenya targets women aged 25 to 49 years for cervical cancer screening (Ministry of Health, 2018) & (Ministry of Health, 2015). Most participants in the study knew the correct interpretation of positive result in CCS. In contrast, among higher education female students in Ethiopia, knowledge about cervical cancer and its causes was found to be inadequate (Tesfaye *et al.,* 2019). However, the mean age of participants from the two studies was different. Mahumud *et al.,* (2020), concluded that women's knowledge and use of CCS services is unequally distributed

according to sociodemographic factors. Of concern in this study is that majority of participants did not know about the contribution of the sexually transmitted HPV virus and use of tobacco products in causation of cervical cancer. HPV is the necessary cause of cervical cancer (IARC, 2013; Louie *et al.,* 2009) while tobacco smoking contributes hugely to the occurrence of CC. Additionally, the following risk factors were less known; multiparity, having a sexual partner with many previous partners and not going for regular cervical screen tests. Significantly more women in the intervention than in the control group at follow up knew that CC can be detected early by screening. This was similar to findings by Ajambo *et al.,* (2017) in a study done in Uganda in which majority of participants knew that cervical cancer can be prevented by early detection at the health facility. If it is detected early and managed effectively, cervical cancer is one of the most successfully treatable forms of cancer. Therefore, the key to controlling CC is prevention and early therapy. HPV vaccination targeting females aged 9 to 13 years has been proven to be efficacious (Louie *et al.,* 2009).

5.2.3 Attitudes on Cervical Cancer Screening

At both baseline and during follow up in the two groups, most participants had positive attitude towards CCS. Among those who initially had negative attitude, more women changed their attitude towards CCS from negative to positive attitude during follow up in the intervention groups. Significantly more participants in the intervention group than in the control group during follow up had a positive attitude towards cervical cancer screening. Acquiring a positive attitude towards health seeking behavior after a health education is supported by studies done in Thailand (Srisuwan *et al.,* 2015) and Ethiopia

(Tsegaye *et al.,* 2018) on Knowledge, Attitudes and Practices regarding Cervical Cancer Screening among Village Health Volunteers (VHVs)**.**

5.2.4 Perception on Cervical Cancer Screening

The perception of majority of women that CC can be detected early through a screen test, that women should be screened because they were at risk of CC is a good indication that they are ready to go for screening if supported by CHVs. However, the perception that a positive screen test meant presence of CC is a barrier for screening which must be addressed by the CHVs during health education. A positive screen test on VIA/VILI means precancerous stage of CC which can be treated. Perception of being at risk for CC was also reported in a study done by Tapera *et al.,* (2017) in Botswana and Ajambo *et al.,* (2017) in Uganda where majority of participants felt that they were at risk of developing cervical cancer. Other studies have shown that a perception of being at risk for cervical cancer is associated with increased uptake of CCS and HPV vaccination (Vermandere *et al.,* 2014; Black *et al.,* 2019). Similarly, in another study done in western Kenya, majority of participants who had heard of CCS felt at risk for CC (Huchko *et al.,* 2015), although their specific knowledge was generally low. However, these findings are not supported by Olubodun *et al.,* (2019) from Nigeria who reported that most respondents did not consider themselves at risk for cervical cancer. This was probably because the study was done among young university students who are not keen on CC.

5.2.5 Uptake of Cervical Cancer Screening

Cervical cancer screening practice was low in both groups at baseline. During follow up, significantly more women in intervention group than control group screened for cervical cancer and knew of a health facility that performed CCS. Knowing a place to go for

screening was found to significantly influence decision of women to screen. This is supported by Ndikom & Ofi, (2012) in which they found that women were not using screening services because they did not know about the services or where to obtain such services. The study further reveals that women knew the importance of CCS in prevention of CC. This follows the discussion they had with CHVs about CCS in intervention group. CHVs within Kenya's community health strategy can be used to create awareness about cervical cancer among eligible women in the community in order to increase demand for CCS services (Choi *et al.,* 2018). Such Community Health Workers have been used in other countries to increase accessibility to Maternal and Child Health services. According to Olayo *et al.*,(2014) and Wangalwa *et al.*,(2012), there was significant improvement in essential maternal and newborn care practices when community-based governance structures were established to organize and coordinate activities of CHWs with the formal health care system. Further, in a systemic review by Schmitz *et al.,* (2019), it was noted that Lay Health Workers play crucial roles in the education of mothers, linkage to care, providing psychosocial support to Mothers Living with HIV and their HIV Exposed Infants, tracing defaulters, promoting exclusive breastfeeding and presentation of mothers with their babies to the clinic.

Despite health education to women by the CHVs, the uptake of CCS generally remained poor even in intervention group with moderate increase. This is attributable to the short duration of intervention in which women had minimal time to change their risk perception of CC. It may also be attributable to underlying attitudinal factors and myths arising from cultural experiences. Such low uptake of screening was also reported by Tekle *et al.,* (2020) and Mahumud *et al.,* (2020) in studies done in Ethiopia and 18 Resource

Constrained Countries respectively. Tapera *et al.,* (2017) attributes such low uptake to lack of perception of being susceptible to cancer and hence lesser likelihood of engaging in preventive behaviors. Mahumud1 *et al.,* (2020) aver that women's knowledge and utilization of CCS services in Low- and Middle-Income Countries (LMIC) are unequally distributed, more so among socioeconomically deprived women in the majority of countries. Opportunistic CCS services are usually practiced in LMIC as reported by Maseko *et al.,* (2015); Tapera *et al.,* (2019) and Black *et al.,* (2019). This opportunistic method of delivering screening services is ineffective because it mostly targets a small proportion of women who have the chance to come in contact with health care providers either in a health facility or within the community for varied needs (Okunowo *et al.,* 2018). Further, opportunistic screening services are not widely accessible; where they are available, the service is totally underutilized (Maseko *et al.,* 2015; Okunowo *et al.,* 2018). The other reason why many women did not take up screening is the perception that a positive screen test result means presence of cervical cancer which causes fear to go for screening. This was supported by Black *et al.,* (2019) in Uganda where participants had fear of the screening procedure or outcome. Community mobilization, peer-to-peer appointments and organizing health systems to trail and follow-up with targeted women through Community Health Strategy should play a significant role in surmounting barriers and ensuring increased uptake of screening services.

5.2.6 Reasons for not screening for cervical cancer

Majority of participants in the study had not been screened for a variety of reasons; they thought that screening was for those with obvious signs and symptoms, they had not been told to go for screening, and fear for screening results. This was in agreement with

observations made in Kenya by other studies (Rosser *et al.*, 2015), where participants did not screen because of busy schedule, needing more time, not having understood enough about screening, fear of pain with the speculum exam. Most women had never been screened due to poor knowledge on CCS despite being aware of it. The varied reasons given for not screening was to justify their ignorance on CCS. Understanding reasons of women regarding their poor uptake of CCS can help medical and public health authorities implement educational programs to increase the absorption of CCS. The probable reason why women will not go for CCS despite widespread efforts by the government and other organizations in sensitizing women is because of lack of paying attention to individual needs of women. Health education by HCW to women at health facilities is provided when women are not ready for the information. Women usually visit health facilities for varied reasons ranging from medical care, ANC services, FP services or Child health services. During this visitation, women are less likely to pay attention to information regarding CCS because that is not the priority at that time. Therefore, women need to be visited at an appropriate time and be sensitized on CCS. Similarly, within the hospital schedule, HCWs have a busy schedule and thus are less likely to give adequate attention to women during health education. Women lack chance to clarify issues regarding CCS at health facilities. To address this challenge, CHVs visits women in their homes at appropriate time, and enlightens her about CCS. The women are able to clarify issues face to face ranging from misinformation, myths, and cultural issues regarding CCS (O'Donovan *et al.*, 2019).

Majority of those who had never been screened in the study were willing to go for screening if they were given more information about CCS. This was also true in a study done by Ndikom and Ofi, (2012) in which they found that women were not using

screening services as they did not know about the services or where to obtain such services. Lack of awareness about screening is one of the major factors that influence uptake of cervical cancer (Ndikom and Ofi, 2012). Women's willingness to go for cervical screening was also reported in a study done in western Kenya (Rosser *et al.,* 2015b) in which up to 79 percent of participants stated that they would undergo screening if offered. CHVs are likely to influence more women who are already willing to go for screening, hence increased uptake. Results of the study indicate that women need to be informed about CCS, and further they need encouragement about possible results.

5.3 Effect of providing individualized cervical cancer education

As a result of health education within the intervention groups, the following increased significantly; uptake of CCS, mean knowledge scores about signs of CC, mean knowledge scores about risk factors for developing CC and attitude scores towards CCS. This is similar to other studies which involved teaching women about cervical cancer and CCS (Naregal *et al.,* 2017; Latifa M. F. *et al.,* 2014 and Rosser *et al.,* 2015). The increase is attributable to the health education conducted by CHVs within the CHS. Integrating CCS awareness within the Community Health Strategy has the potential to increase uptake of CCS and knowledge of women regarding CCS. This is supported by studies on effectiveness of CHWP to promote exclusive breastfeeding (EBF) in urban poor settings in Nairobi (Kimani-Murage *et al.,* 2016), on maternal and newborn care, and encouraged skilled deliveries (Adam *et al.,* 2016). Further, CHS approach was used in a community-based maternal and newborn care intervention package in Busia County to test the effectiveness of Kenya's CHS in delivering community-based maternal and newborn health care. At the end of the intervention, there was statistically significant increase in

attendance of at least four antenatal care visits, skilled deliveries, receiving intermittent preventive treatment, testing for HIV during pregnancy, and EBF (Wangalwa *et al.,* 2012). In contrast, in a study in Nigeria, health education did not cause increased uptake of CCS (Adamu *et al.,* 2012).

5.4 Factors associated with increased uptake of Cervical Cancer Screening

At bivariate level, factors associated with increased uptake of CCS included: socio-demographic factors, source of information, knowledge level about CCS, and health education. Single women were more likely to be screened than their married counterpart. Other studies have identified cultural attitudes, expense, time commitments, and practicalities involved with cervical screening to be common hurdles to using screening programs (Ngugi *et al.,* 2012). The proportion of women who have never been screened for cervical cancer varies by area of residence, demographic variables, and HBM constructs, (Stanley *et al.,* 2015); (Mahumud1 *et al.,* 2020). However, Stanley *et al.,* (2015) notes that regardless of where women live, some women report having difficulty getting health care, this may prevent them from getting Pap tests for CCS (Stanley *et al.,* 2015). Women who live in low-income, resource-constrained metropolitan locations are less likely to receive timely CCS, but they are more likely to be diagnosed with advanced cancer (Ndejjo *et al.,* 2016; Black *et al.,* 2019). Women with moderate to good knowledge on risk factors of developing CC were more likely to go for CCS. Similarly, women in Uganda showed intention to screen if they were knowledgeable about CCS (Ndejjo *et al.,* 2017). Women in the intervention group were more likely to screen. Studies in other LMICs show change in health seeking behavior when LHWs sensitize women about

primary health care services including Maternal Child Health and Neonatal care (Schmitz *et al.,* 2019).

Three factors were independently associated with uptake of CCS including marital status, source of information about CCS and Health education on CCS. Women who were single were two times more likely to go for CC screening. Women who got information about CCS from HCW and CHVs were 1.8 and 1.4 respectively times more likely to go for CCS, while women who discussed about CCS with CHVs were more than four times likely to go for CCS. This is supported by Black *et al.,* (2019) in a systematic review on barriers and facilitators to uptake of CCS. In the review, it was noted that being recommended to attend screening by a HCW was a significant facilitator to going for CCS. Other facilitators to screening identified in the review included knowledge of CCS, perceived risk of CC, not afraid of outcome, personal/family experience with CC, age above 25 years, post-secondary education, higher income, formal employment, residing in urban setting, and community outreach (Black *et al.,* 2019). Women who had been recommended by a HCW were 87 times more likely to have been screened for CC compared with their counterparts. This is probably because of the trust the women have for HCWs. CHVs are members of the health system in addition to members of the community. Thus, their involvement in health education contributes in the women's decision to go for CCS. Further, women found it difficult to present for screening when health facilities were not nearby. Majority of participants are exposed to two main risk factors for developing CC including multiple sex partners and non-use of condoms during sex all the time. This finding is in contrast with findings in Ethiopia (Tekle *et al.,* 2020), in which 79 percent of respondents had single sexual partners and 50 percent had not used condoms during sexual intercourse. Other risk factors exposed to include; not testing for

the HIV status, exposure to STI, and early sexual debut among girls. Similar findings were reported by Tsegaye *et al.,* (2018) and Tekle *et al.,* (2020).

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

6.1.1 Availability of resources supporting cervical cancer screening

Evidence from this study demonstrates that the existing health facilities are accessible and offer CCS services on a particular day of the week. There are adequate HCWs who have been prepared to conduct CCS. CHVs have an established communication network with community members including women. The County has adequate number of CHVs who, if adequately empowered, could be used to sensitize women on CCS. However, due to low educational levels, they may not have optimal knowledge on CCS. The health education kit for CHVs should be customized to the low-level education status of most of the women for ease of understanding. Therefore, CHVs is a potential human resource that can increase awareness on CCS among women.

6.1.2 Knowledge, attitude and practices on cervical cancer screening among women

Women's knowledge level on signs and symptoms of cervical cancer and risk factors for developing cervical cancer was poor. However, women's attitude towards cervical cancer screening was positive. More women perceived themselves to be at risk for developing cervical cancer.

6.1.3 Effect of providing individualized cervical cancer awareness through CHVs on uptake of cervical cancer screening

Whereas women became more aware of CCS, developed good knowledge of signs of Cervical Cancer and risk factors for developing CC and have a positive attitude towards CCS; majority did not go for CCS due to varied reasons. There must be deeper underlying

barriers to cervical cancer screening. Further, this intervention was short to address the deeper underling barriers to CCS.

6.1.4 Factors associated with uptake of cervical cancer screening

Uptake of cervical cancer screening was associated with marital status, source of information about CCS and Health education on CCS by CHVs. Women were more likely to go for cervical cancer screening if they were single/never married, received information on cervical cancer screening from health care providers, had moderate to good knowledge about cervical cancer screening and had discussed with community health volunteers about cervical cancer screening. Receiving information on CCS from CHVs was associated with four times likelihood of CCS among women.

6.2 Recommendations

Based on conclusion of this study, the following recommendation are made

6.2.1 Resources supporting CCS

Policy makers; County governments need to develop guidelines within the Community Health Strategy specifying the roles and scope of Community Health Volunteers in controlling and prevention of Cervical Cancer.

Practice of CCS; there should be a systematic approach to visitation and discussion with women, supervision, documentation, system improvement, and referral system to enable information movement.

Further research on aspects of CCS; further research needs to be done to find out the challenges of integrating CCS awareness creation in community health strategy.

6.2.2 Knowledge, attitude and practice of CCS

Policy makers; Community Health Volunteers need to be trained by the Ministry of Health on aspects of Cervical Cancer and Screening, including; signs of Cervical Cancer, Risk factors for developing Cervical cancer, prevention, control and treatment of Cervical Cancer. The content should be customized to their level of education.

Practice of CCS; the current knowledge and attitude of CHVs on CCS and their involvement in awareness creation should be used by the county government as an opportunity to increase capacity of CHVs on Cervical Cancer Screening.

Further research on aspects of CCS; the county government should develop research tools that can be used by CHVs to collect data from women. Further, CHS division should conduct research on CHVs to find out attitudes and practice of CCS among CHVs

6.2.3 Effect of integrating CCS awareness creation for uptake of screening in community health strategy

Policy makers; governance structures of CHS should be expanded and strengthened further by the county government to ensure CCS activities are included in scope of CHS

Practice of CCS; CHVs should be trained on the communication skills required to educate women on CCS.

Further research on aspects of CCS; the county government need to analyze the cost effectiveness of the integration of CCS and CHS.

6.2.4 Factors associated with uptake of CCS

Policy makers; the county government should initiate a monitoring and evaluation program to track trends of factors barring uptake of CCS. Cervical cancer screening should

be integrated into primary health care services in order to increase awareness on the use of Pap smear test.

Practice of CCS; factors which hinder uptake of CCS should be identified by the ministry of health and efforts made by CHVs to demystify the barriers

Further research on aspects of CCS; a qualitative research need to be conducted to establish deeper factors associated with uptake of CCS despite good knowledge and positive attitude towards CCS.

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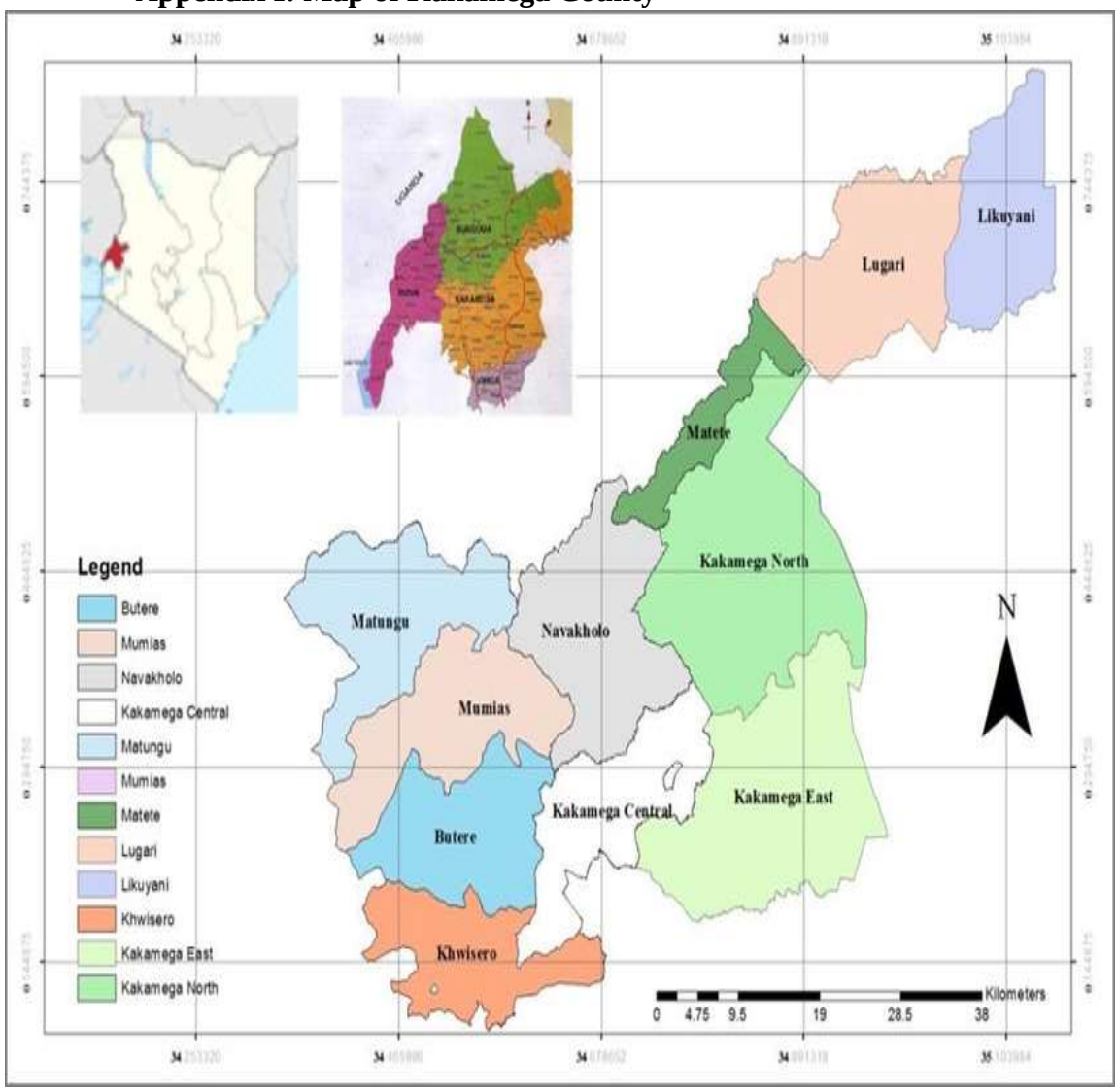
APPENDICES

Appendix I: Map of Kakamega County



Appendix II: Distribution of Community Units in intervention and control groups

Sub county	Community units	Group	Villages	Number of House holds
Lurambi	Bukura	Control	Eshiandukusi	18
			Emukombero	18
			Echibiywa	18
	Sichirai E	Intervention	Mulombelo	18
			Musikongo	18
			Shipalo	18
Ikolomani	Ivonda	Control	Ishianji	18
			Ivole	18
			Kasavai	18
	Shikulu	Intervention	Shanavonga	18
			Shitsulio	18
			Shichinji	18
Khwisero	Eshibinga	Control	Ebuhinjiri	18
			Emaruku	18
			Ematundu	18
	Mundeku	Intervention	Empaka	18
			Etangale	18
			Ikhaba	18
Butere	Bulanda	Intervention	Ebulanda	18
			Township/Emwikali	18
			Eshiyekwe	18
	Shiatsala	Control	Ebumere	18
			Emasuba	18
			Makunda A	18
Mumias East	Kamashia	Control	Ebulembo	18
			Eshikufu	18
			Kamashia A	18
	Makunga	Intervention	Emuyere	18
			Isango B	18
			Ishiaka A	18
Matungu	Lung'anyiro	Intervention	Buchimo	18
			Lwakhakha	18
			Nanyeni	18
	Musamba C	Control	Mabolo B	18
			Nakhomako	18
			Musamba rural	18
Navakholo	Ematiha	Control	Emulama B	18
			Munenga	19
			Vihande	18
	Nambacha	Intervention	Mavanga	18
			Municipality A	18
			Upukhulu C	18
Malava	Matsakha	Control	Lutinyi	18
			Matsakha A	19
			Matsakha C	18
	Tande	Intervention	Chevaywa	18
			Fukoye	18
			Tande	18

Appendix III: Informed Consent form

Available resources supporting cervical cancer screening Consent Form

Sub-Title of Research: To assess available resources supporting cervical cancer screening in Kakamega County.

Researcher: Gregory Okonya Sakwa, (Programme being fulfilled is Doctor of Philosophy in Health Promotion): Before agreeing to participate in this research, it is important that you read the following explanation of this study. This statement describes the purpose, procedures, benefits, risks, discomforts, and precautions of the program. Also described are the alternative procedures available to you, as well as your right to withdraw from the study at any time.

Explanation of Procedures

You are being asked to participate in a research to investigate available resources supporting cervical cancer screening in Kakamega County. The approach of the research is through the use of one questionnaire. You will respond to the questions for about 10 minutes.

Risks and Discomforts

You will not be at physical or psychological risk and you will experience no discomfort resulting from answering the questions.

Benefits

There are no direct benefits by participating in this study. However, this study is expected to yield knowledge on factors influencing cervical cancer screening uptake.

Confidentiality

All information gathered from the study will remain confidential. Your identity as a participant will not be disclosed to any unauthorized persons; only the researcher and when necessary by the committees that approved this study will have access to the research materials, which will be kept in a locked drawer. Any references to your identity that would compromise your anonymity will be removed or disguised prior to the preparation of the research reports and publications.

Withdrawal without Prejudice. Participation in this study is voluntary; refusal to participate will involve no penalty. You are free to withdraw consent and discontinue participation in this research at any time without prejudice.

Costs and/or Payments to participants for Participation in Research

There will be no costs for participating in the research. Also, you will not be paid to participate in this research project.

Payment for Research Related Injuries

Although there are no risks of injury involved with this study, the researcher has made no provision for monetary compensation in the event of injury resulting from the research. In the event of such injury, the researcher will provide assistance in locating and accessing

appropriate health care services. The cost of health care services is the responsibility of the participant or maybe shared.

Alternative Procedures

If a person chooses not to participate, an alternative procedure is not necessary.

Questions

Any questions concerning the study and/or in the case of injury (whether physical or Psychological) due to the research, participants can call Mr. Gregory Okonya Sakwa of 0722661575.

Questions regarding rights as a person in this study should be directed to the Chairman, MMUST Ethics and Review Committee, the one who authorized this research on behalf of the committee.

Agreement

This agreement states that you have received a copy of this informed consent. Your signature below indicates that you agree to participate in this study.

Participant name; _____ Signature; _____ Date; _____

Signature of Researcher/Research Assistant; _____ Date _____

Knowledge, attitude and practice on cervical cancer screening Consent Form

Sub-Title of Research: To determine baseline and post intervention knowledge, attitude and practices on Cervical Cancer screening among women aged 25 to 49 years in Kakamega County.

Researcher: Gregory Okonya Sakwa, (Programme being fulfilled is Doctor of Philosophy in Health Promotion): Before agreeing to participate in this research, it is important that you read the following explanation of this study. This statement describes the purpose, procedures, benefits, risks, discomforts, and precautions of the program. Also described are the alternative procedures available to you, as well as your right to withdraw from the study at any time.

Explanation of Procedures

You are being asked to participate in a research to investigate both baseline and post intervention knowledge, attitude and practice of cervical cancer screening amongst women aged 25-49 years. The approach of the research is through the use of one questionnaire. You will complete the first part of the questionnaire that will make us know you better today; this should take about 10 minutes. Afterwards, you shall respond to the rest of the questions for about 30 minutes.

Risks and Discomforts

You will not be at physical or psychological risk and you will experience no discomfort resulting from answering the questions.

Benefits

There are no direct benefits by participating in this study. However, this study is expected to yield knowledge on factors influencing cervical cancer screening uptake.

Confidentiality

All information gathered from the study will remain confidential. Your identity as a participant will not be disclosed to any unauthorized persons; only the researcher and when necessary by the committees that approved this study will have access to the research materials, which will be kept in a locked drawer. Any references to your identity that would compromise your anonymity will be removed or disguised prior to the preparation of the research reports and publications.

Withdrawal without Prejudice. Participation in this study is voluntary; refusal to participate will involve no penalty. You are free to withdraw consent and discontinue participation in this research at any time without prejudice.

Costs and/or Payments to participants for Participation in Research

There will be no costs for participating in the research. Also, you will not be paid to participate in this research project.

Payment for Research Related Injuries

Although there are no risks of injury involved with this study, the researcher has made no provision for monetary compensation in the event of injury resulting from the research. In the event of such injury, the researcher will provide assistance in locating and accessing appropriate health care services. The cost of health care services is the responsibility of the participant or maybe shared.

Alternative Procedures

If a person chooses not to participate, an alternative procedure is not necessary.

Questions

Any questions concerning the study and/or in the case of injury (whether physical or Psychological) due to the research, participants can call Mr. Gregory Okonya Sakwa of 0722661575.

Questions regarding rights as a person in this study should be directed to the Chairman, MMUST Ethics and Review Committee, the one who authorized this research on behalf of the committee.

Agreement

This agreement states that you have received a copy of this informed consent. Your signature below indicates that you agree to participate in this study.

Participant name; _____ Signature; _____ Date; _____

Signature of Researcher/Research Assistant; _____ Date _____

Health education administration consent form

Sub-Title of Research

To integrate health education on cervical cancer screening in community strategy as a process of increasing screening uptake among women aged 25-49 years in Kakamega County.

Researcher

Gregory Okonya Sakwa: (Programme being fulfilled is Doctor of Philosophy in Health Promotion). Before agreeing to participate in this research, it is important that you read the following explanation of this study. This statement describes the purpose, procedures, benefits, risks, discomforts, and precautions of the program. Also described are the alternative procedures available to you, as well as your right to withdraw from the study at any time.

Explanation of Procedures

You are being asked to participate in a research of integrating health education on cervical cancer screening in community strategy as a process of increasing screening uptake among women aged 25-49 years in Kakamega County. The health education package will be administered by a community health volunteer who will tell you his/her name. This will be done in two sessions each lasting 30 minutes one day a part.

Risks and Discomforts

You will not be at physical or psychological risk and should experience no discomfort resulting from health education or discussing the key issues highlighted by the health education.

Benefits

There are no direct benefits by participating in this project. However, this research is expected to yield a strategy for increasing the practice of cervical cancer screening amongst women aged 25-49 years in Kakamega County.

Confidentiality

All information gathered from the study will remain confidential. Your identity as a participant will not be disclosed to any unauthorized persons; only the researcher and when necessary by the committees that approved this study will have access to the research materials, which will be kept in a locked drawer. Any references to your identity

that would compromise your anonymity will be removed or disguised prior to the preparation of the research reports and publications.

Costs and/or Payments to Subject for Participation in Research

There will be no costs for participating in the research. Also, you will not be paid to participate in this research project.

Payment for Research Related Injuries

Although there are no risks of injury involved with this study, the researcher has made no provision for monetary compensation in the event of injury resulting from the research. In the event of such injury, the researcher will provide assistance in locating and accessing appropriate health care services. The cost of health care services is the responsibility of the participant or maybe shared.

Alternative Procedures

If a person chooses not to participate, an alternative procedure is not necessary.

Questions

Any questions concerning the study and/or in the case of injury (whether physical or Psychological) due to the research, participants can call Mr. Gregory Okonya Sakwa of 0722661575. Questions regarding rights as a person in this study should be directed to the Chairman, MMUST ethics review committee, the one who authorized this research on behalf of the committee

Agreement

This agreement states that you have received a copy of this informed consent. Your signature below indicates that you agree to participate in this study.

Participant name; _____ Signature; _____
Date; _____

Signature of Researcher /Research Assistant; _____

Date _____

Appendix IV: Woman's Questionnaire (pre-intervention)

Cervical cancer screening in Kakamega County

Kindly answer the following questions as honestly as possible. This questionnaire is for purposes of finding out the post intervention factors that determine uptake of cervical cancer screening. This questionnaire is anonymous and confidential, and the information you share shall be used for purposes of an academic report and to improve effectiveness of cervical cancer screening program. The questionnaire will take you about 25-35 minutes to fill. Your written consent will be sought before you start filling in the questionnaire.

Date of interview: …….

Time of interview……

Section A: Socio-economic and demographic data

Sub county; ----------

Community Unit; ----------

Village; ----------

Participant's No; ……

We would now like to ask you a few questions about yourself. This will help us to analyze the results of the survey. The data collected will help us to identify specific age or demographic groups of people who are in need of more information about cervical cancer. You will be asked your name and all of your answers will be kept strictly confidential and anonymous. Your details will not be passed onto any other person

1. Could you tell me your age? ---------- (years)
2. What is your marital status?
   a) Single (never married) (1)
   b) Married/living together (2)
   c) Divorced /separated (3)
   d) Widowed (4)
3. How many children have you given birth to? ----------
4. Which is your religion:
   a) Roman catholic (1)
   b) Protestant 2
   c) African Independent churches (3)
   d) Muslim (4),
   e) No religion (5) ……. (specify)
5. Where is your residential place:
   a) Urban (1),
   b) Rural (2)

6. What is the highest level of education qualification you have obtained?
    a) No education (1)
    b) Primary incomplete (2)
    c) Primary complete (3)
    d) Secondary incomplete (4)
    e) Secondary complete (5)
    f) College/University (6)
7. Which of these best describes your living arrangement?
    a. Own home
    b. Rental house (government house)
    c. Rental house (privately)
8. How many years have you been living in Kakamega County? ----------
    -
9. What is your occupation?
    a. Professional (1)
    b. Business (2)
    c. Farmer (for business and consumption) (3)
    d. Housewife (4)
    e. Student (5)
10. Do you or does anyone living with you own a car or a van?
    a. No (0)
    b. Yes (1)

This is a set of questions about your awareness of cervical cancer and cervical cancer screening. It will also assess your personal risk and perception of cervical cancer. The questions should take around 20 minutes to complete. This is not a test, we are interested in your thoughts and beliefs, so please answer the questions as honestly as you can. All your answers are confidential. Please be aware that I am unable to answer questions during the interview, but there will be time to address any queries at the end. Please also be aware that I cannot go back to a question that has already been asked.

Section B: ***Knowledge about cervical cancer: clinical manifestations***

11. Have you heard of cervical cancer?
    a. Yes (1)
    b. No (0)

If yes to number 11 above, answer the following;

12. What was the source of information about cervical cancer?
    a. Newspaper (1)
    b. Television/Radio (2)
    c. Friend (3)
    d. Health care worker (4)
    e. CHV (5)

13. Have you, your partner, your family or close friend had cancer?

		Yes	No
14.	You		
15.	Partner		
16.	Your family		

The following may or may not be warning signs for cervical cancer. We are interested in your opinion *(multi-response question)*

S/No		Yes	No	Don't know
17.	Do you think vaginal bleeding between periods could be a sign of cervical cancer?			
18.	Do you think persistent lower back pain could be a sign of cervical cancer?			
19.	Do you think a persistent vaginal discharge that smells unpleasant could be a sign of cervical cancer?			
20.	Do you think discomfort or pain during sex could be a sign of cervical cancer?			
21.	Do you think menstrual periods that are heavier or longer than usual could be a sign of cervical cancer?			
22.	Do you think persistent diarrhea could be a sign of cervical cancer?			
23.	Do you think vaginal bleeding after the menopause could be a sign of cervical cancer?			
24.	Do you think persistent pelvic pain could be a sign of cervical cancer?			
25.	Do you think vaginal bleeding during or after sex could be a sign of cervical cancer?			
26.	Do you think blood in the stool or urine could be a sign of cervical cancer?			
27.	Do you think unexplained weight loss could be a sign of cervical cancer?			

28. If you had a symptom that you thought might be a sign of cervical cancer, how soon would you contact your doctor to make an appointment to discuss it? ------ (days)
29. Who of the following is at risk to develop cervical cancer?
    a. A woman aged 15 to 20 years
    b. A woman aged 21 to 49 years
    c. A woman aged 50 to 69 years
    d. A woman aged 70 or over
    e. Cervical cancer is unrelated to age
    f. Do not know *(interviewer does not read it out)*

Section C: ***Knowledge about cervical cancer: Risk factors***

The following **may** or **may not** increase a woman's chance of developing cervical cancer. How much do you agree or disagree that each of these can increase a woman's chance of developing cervical cancer?

SD = strongly disagree, D = disagree, NS = not sure, A = agree, SA = strongly agree

S/No		**SD**	**D**	**NS**	**A**	**SA**
30.	Infection with Human Papillomavirus, HPV					
31.	Smoking any cigarettes at all					
32.	Having a weakened immune system (e.g. due to HIV/AIDS, immunosuppressant drugs)					
33.	Long term use of contraceptive pill					
34.	Infection with Chlamydia (a sexually transmitted infection)					
35.	Having a sexual partner who is not circumcised					
36.	Starting to have sex at a young age (before age 17)					
37.	Having many sexual partners					
38.	Having many children					
39.	Having a sexual partner with many previous partners					
40.	Not going for regular cervical screen tests					

41. How confident are you that you would notice a cervical cancer symptom?
    a. Not very confident
    b. Fairly confident
    c. Very confident
42. Do you think you are at risk for cervical cancer (Perception of Risk)
    a) Yes (1)
    b) No (2)
    c) I don't know (3) *(interviewer does not read it out)*

Section B: ***Knowledge about screening for cervical cancer***

43. Do you know that it is possible to detect cervical cancer early by screening?
    a. Yes (1)
    b. No (2)
    c. Don't know (3)

If yes to above;

44. Who should get screened for cervical cancer?
    a. Married women
    b. Unmarried women
    c. Sex workers
    d. Any female
45. Which of the following cervical cancer screening tests have you heard of?
    a) Pap's smear (1)
    b) Visual inspection with acetic acid (VIA) (2)
    c) Visual inspection with Lugol's iodine (VILI) (3)
    d) HPV DNA (4)
    e) None (5)
46. At what age is it advisable to get screened?
    a. Old women >60 years
    b. Young women 25-49 (2)
    c. Adolescent girls 12-19 years (3)
    d. Not sure (4)
47. Where do you think the screening is done? (multiple responses permitted)
    a. Government health facilities (1)
    b. Private hospitals (2)
    c. Nursing homes (3)
    d. Women's hospital (4)
    e. At home (in the community) (5)
48. A positive result means presence of cervical cancer
    a. Yes
    b. No
    c. Don't know.

    {Correct response for question 44, 45, 49, and each response for 48 carried 1 mark. So, the maximum will be 8 and minimum will be 1. The knowledge will be graded as: <3 being poor knowledge; 4-5 being satisfactory knowledge and ≥6 being good knowledge}.

Section c: Access to and practice of cervical screening

49. Have you been visited by a CHV in the last 12 months?
    i) Yes (1)
    ii) No (2)

50. If yes to above, did he/she discuss with you about cervical cancer?
    a. Yes (1)
    b. No (2)
51. Do you know of a health facility near your home that screens cervical cancer?
    a. Yes (1)
    b. No (2)

52. If yes to above, how far is the facility from your home? …….(km)

53. Which means of transport do you normally use when accessing this health facility?
    a. On foot (1)
    b. Motor cycle (2)
    c. Public van (3)
    d. Private car (4)
54. Have you ever been screened for cervical cancer in the past?

    i) Yes (1)
    ii) No (2)
55. If yes, screening which method was used?
    a) Pap smear (1)
    b) VIA/VILLI (2)
    c) HPV DNA (3)
    d) Do not know (4)
56. What was the result of the test?

    i) Dysplasia (1)
    ii) Cancerous (2)
    iii) Inflammatory (3)
    iv) Inconclusive (4)
    v) Negative (5)
    vi) Don't know (6)
57. If no to number 55 above, why have you not gone for cervical cancer screening test? (Select all that apply)
    a) The screening facility is far from me (1)
    b) It is costly (2)
    c) I am always busy (3)
    d) It is for married women (4)
    e) It is for those with obvious signs and symptoms; e.g. vaginal bleeding or pain (5)
    f) Husband not in support (6)
    g) Afraid of the result (7)
    h) Fear of vaginal examination (8)
    i) Test is uncomfortable (9)
    j) I have never been told to go for screening (10)
    k) Staff are unfriendly/not available (11)
    l) Would prefer female Healthcare Workers to do Vaginal Examination (12)

58. If you were explained about cervical cancer screening test and the services are available near where you stay and an opportunity is given to you to do the test, will you be willing to do the test?
    a. Yes (1)
    b. No (2)
    c. Undecided (3)
59. If yes to the above, how soon would you plan to go for screening after explanation?
    (1) Less than 6 months (1)
    (2) More than 6 months but less than 12 months (2)
    (3) More than 12 months (3)
60. If no to number 59 above, what are the reasons?
    a. I will not get the disease (1)
    b. Feeling shy (2)
    c. Fear of positive result (3)

Section D: Description of Perceived Barriers responses **(Attitude)**

Please indicate how much you agree or disagree with each of the following statements:

SD = strongly disagree, D = disagree, NS = not sure, A = agree, SA = strongly agree

S/No		SD	D	NS	A	SA
61.	Getting a cervical screen test would only make me worry					
62.	The cervical screen test is painful.					
63.	It is too expensive to have a cervical screen test.					
64.	Being examined by a male provider would discourage me.					
65.	If I don't have any discomfort or pain, I don't need a cervical screen test.					
66.	I would not get a cervical screen test because of fear of test results.					
67.	It is too embarrassing to have a cervical screen test.					
68.	If a woman has not had sex, a cervical screen test will take away her virginity.					
69.	I don't know where I could go if I wanted a cervical screen test					
70.	My partner would not want me to have a cervical screen test.					
71.	If a young, unmarried woman goes for a cervical screen test, everyone will assume she is having sex.					
72.	A cervical screen test is not important for a woman of my age					
73.	Cervical screen test results cannot be trusted because some labs do the test better than others.					
74.	I worry that if I have a cervical screen test, I will need an operation					

Section E: Cervical cancer risk factors

The following questions will seek personal information. Remember all answers are anonymous and treated confidentially

75. Do you smoke cigarette?

    a. Yes, currently smoking (1)
    b. No, stopped smoking (2)
    c. No, never smoked (3)

76. At what age did you have first sexual intercourse---------- (years) (use previous events to enable her remember, e.g., form 2….)

77. Have you had sex with more than one man?

    a) Yes (1)
    b) No (2)

78. Which family planning method do you use?
    a) None (1)
    b) Depo-Provera (2)
    c) Long-term (IUCD or Implant) (3)
    d) Condom (4)
    e) Permanent (Tubal Ligation or Vasectomy) (5)
    f) Other (COC, natural) (6)

79. If using any of the above, for how long have you used the method?---------(years)
80. Do you use condoms during sex?

    a) All the time (1)
    b) Most of the time (2)
    c) Some of the time (3)
    d) Rarely (4)
    e) Not at all (5)

81. Women often have whitish vaginal discharge; but have you had worrisome vaginal discharge that required treatment in the past?

    a. Yes (1)
    b. No (2)

82. In the last 6 months, have you tested for your HIV status?
    a. Yes (1)
    b. No (2)
83. What is your HIV status?
    a. Negative (1)
    b. Positive (2)
    c. I don't know (3)

Thank you for taking time to answer my questions. Now that the interview is over, would you like to ask any questions? Or do you have any comments?

Checklist on resources supporting cervical cancer screening

Section A: Head of health facility

Participant number ----------

Sub county; ----------

Community Unit; ----------

Kindly answer the following questions as honestly as possible. This questionnaire is for purposes of finding out the available resources supporting cervical cancer screening in Kakamega County. This questionnaire is anonymous and confidential, and the information you share shall be used for purposes of an academic report and to improve effectiveness of cervical cancer screening program. The questionnaire will take you about 10 minutes to respond. Your consent will be sought before you start responding to the questions.

1. For how long have you been working in this facility? _____(months)
2. What is your position in this facility?
    a. In- charge
    b. Deputy in charge
3. What is your profession?
    a. Physician
    b. Nursing officer
    c. Clinical officer
    d. Nutrition officer
    e. Others
4. What is your highest level of training?
    a. PhD
    b. Masters
    c. Bachelor's degree
    d. Diploma
    e. Certificate
5. Which type of health facility is this;
    a. County referral (0)
    b. County hospital (1)
    c. Sub county hospital (2)

d. Health center (3)

e. Dispensary (4)

6. Where is the Facility Located?
   a. Urban (0)
   b. Rural (1)
   c. Peri-urban (2)
7. How many community Units refer clients to this health facility….
8. Does the facility offer Cervical Cancer Screening services;

   a. Yes (1)

   b. No (0)

      If yes to above,

9. Does the facility have designated clinic for cervical cancer screening;

   a. Yes (1),

   b. No (0)

10. Which type of Cervical Cancer Screening is done in this facility; ----------

    a. None (0)

    b. VIA/VILI (1)

    c. Pap smear (2)

    d. HPV DNA (3)

11. For how long has the facility been providing cervical cancer screening? ----------

12. In the last 6 months, how many clients have you received for cervical cancer screening? ....
13. Does the clinic offer Cervical Cancer Screening services daily?
    a. Yes (0)
    b. No (1)
14. For those clients in this facility who test positive, what therapy is offered to them;

    a. None, may be referred (0)

    b. Cryotherapy (1)

    c. LEEP (2)

    d. Conisation (3)

    e. Hysterectomy (4)

15. How many clinical/technical staff do you have? …….
16. How many of these staff in the facility have been trained in cervical cancer screening?

17. How were they trained for this assignment of cervical cancer screening?
    a. In college lasting more than six months (2)
    b. In a workshop lasting more than two weeks/14 days (1)
    c. On job training under a senior practitioner (0)
18. Do you think that the training they received is adequate to perform their duties? ----------
    a. No (0)
    b. Yes (1)
19. What kind of training do you think is important to improve the service?
    a. A Practical training (0)
    b. Theoretical training (1)
20. If you do not offer cervical cancer screening, what do you do to clients who come for cervical cancer screening? .....
    a. Refer them back home verbally (0)
    b. Refer them to another facility with a note (1)
    c. Screen for cervical cancer (2)
21. Does the facility have referral forms to refer clients to other health facilities? *(interviewer confirms by calling for it)*
    a. Yes (1)
    b. No (0)

Section B: Community Health Volunteers

Village; ----------

We would now like to ask you a few questions about your work. This will help us to analyze the results of the survey. The data collected will help us to identify specific resources which are needed in cervical cancer screening. You will not be asked your name and all of your answers will be kept strictly confidential and anonymous. Your details will not be passed onto any other person

Section A: Socio-demographic information

1) What is your age; ……(Years)
2) Gender; ……..

    a. Male
    b. Female

3) What is your marital status; ……

    a. Single (never married) (0)
    b. Married/living together (1)
    c. Divorced /separated (2)
    d. Widowed (3)

4) What is your highest level of education attained; ……

    a) No education (0)
    b) Primary incomplete (1)
    c) Primary complete (2)
    d) Secondary incomplete (3)
    e) Secondary complete (4)
    f) College/University (5)

5) For how long have you worked as a Community Health Volunteer; … (years)
6) How many households do you serve; ……..
7) How do you contact your clients…….

    a. Random phone call (0)
    b. Home visit on request by client (1)
    c. Scheduled home visit (2)
    d. Random home visit (3)

8) How often do you contact/visit each households; ……

    a. Weekly (0)
    b. Monthly (1)
    c. Only when needed (2)

9) Which community members do you target mainly; ……

    a. Father only (0)
    b. Mothers and children (1)
    c. Father, mother and children (0)

10) Which key health messages do you give to clients; ……

    a. Antenatal, intra-natal, post natal and child health messages (0)
    b. Family planning health messages (1)
    c. Maternal and Child Health, and Family planning (2)
    d. Cervical cancer and screening health messages (3)

11) Have you heard of cervical cancer and screening; ……

    a. No (0)
    b. Yes (1)

If yes to above;

12) What was the source of information about cervical cancer?
    a. Newspaper/Television/Radio (0)
    b. Friend (1)
    c. Health care worker (2)
13) Does your work as a CHV involve sensitizing women on cervical cancer and screening?
    a. No (0)
    b. Yes (1)
14) Have you been trained on cervical cancer screening; ……

    a. No (0)
    b. Yes (1)

15) If yes to the above, was the training aimed to empower you perform as a Community Health Volunteer

    a. No (0)
    b. Yes (1)

16) Is cervical cancer and screening included in the health education package you discuss with women

    a. No (0)
    b. Yes (1)

17) Do you perform cervical cancer screening

    a. No (0)
    b. Yes (1)

18) Interviewer initial

Appendix V: Letter of Transmittal

Dear Participant,

RE: SUPPORT ON PHD PROJECT

My name is Gregory. In partial fulfillment of the requirements for the award of the PhD degree in Health promotion, of the Masinde Muliro University of Science and Technology, I'm undertaking a research on "Integrating uptake of cervical cancer screening in community strategy in Kakamega County, Kenya". In this regard, I'm kindly seeking your support in terms of time and information towards responding to the attached questionnaire. Your accuracy and candid response will be critical in ensuring objectivity of this research. It will not be necessary to write your name on this questionnaire and please be assured that all information received from you will be treated with utmost confidentiality.

A soft copy of the final project report may be shared with you upon your request. Thank you for your valuable time and information.

Yours faithfully

……..

Gregory Sakwa, 0722 661 575

Appendix VI: Health Education on Cervical Cancer and Screening

Good morning/good afternoon sir/madam! I would like to talk to you about cervical cancer and cervical cancer screening.

a. **What is a cervix?**

   Cervix is the lower part of the womb

b. **What is Cervical Cancer?**

   When cells in the cervix grow abnormally out of control.

c. **What causes cervical cancer?**

   The primary cause of cervical cancer is persistent infection with a virus called human papillomavirus (HPV).

   - HPV is acquired during sexual relations
   - In most cases, these HPV infections resolve spontaneously.
   - However, a few of HPV infections persist; in women this may lead to **cervical pre-cancer**

d. **Which are the risk factors for getting cervical cancer?**

   ❖ **The main risk factor is not going for regular cervical screen tests**

   Others are;

   ❖ Infection with Human Papilloma Virus, HPV through early sexual activity before age 17), or multiple sexual partners

e. **Which are the signs and symptoms of cervical cancer in a woman?**

   Usually, cervical cancer presents no symptoms in its early stages. As the disease progresses, a woman starts to feel warning signs.

   Warning signs do not indicate presence of cervical cancer. They indicate **pre-cancer/abnormal cells**, which can be treated if discovered early.

   These warning signs include;

   ❖ Persistent Pelvic pain

   ❖ Persistent lower back pain

   ❖ Pain during sexual intercourse

   ❖ Unusual vaginal discharge;

- Watery, bloody vaginal discharge that might be heavy and have a foul odor

❖ Vaginal bleeding during or after intercourse, between periods or after menopause

❖ Menstrual periods that are heavier or longer than usual

f. How can cervical cancer be prevented?

Most cervical cancer cases are preventable. Prevention practices include avoiding the above risk factors, administration of HPV vaccine to girls aged 9 - 13 years before their first sexual intercourse

g. Which are the methods recommended for cervical cancer screening in Kenya?

In Kenya, there are three methods recommended for screening for cervical cancer. These are;

a. *Visual Inspection with Acetic Acid, (VIA) and Visual Inspection with Lugol's Iodine (VILI)*
b. *Pap smear*
c. *HPV Testing*

h. Where can one get cervical cancer screening services?

VIA/VILI tests are available in all government health facilities for free.

i. Which are the treatment options and recommendations for cervical cancer?

❖ Cryotherapy

❖ Surgery

❖ Chemotherapy

❖ Radiotherapy

j. Common reasons that prevent women from going for screening include; False information that;

i. Screening is painful
ii. Positive result means cancer
iii. There is no treatment
iv. Can only test if you have signs and symptoms
v. False perception about risk of Cervical Cancer

Appendix VII: Approval by Directorate of Post graduate Studies

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
(MMUST)

Tel: 0702597360/61
: 0733120020/22
E-mail: deansgs@mmust.ac.ke
Website: www.mmust.ac.ke

P.O Box 190
50100 Kakamega
KENYA

Directorate of Postgraduate Studies

Ref: MMU/COR: 509079

9th February, 2018

Gregory Sakwa
HPS/LH/002/2015
P.O. Box 190-50100
KAKAMEGA

Dear Mr. Sakwa ,

RE: APPROVAL OF PROPOSAL

I am pleased to inform you that the Directorate of Postgraduate Studies has considered and approved your Ph.D proposal entitled: ***"Integrating Uptake of Cervical Cancer Screening in Community Strategy in Kakamega County, Kenya"*** and appointed the following as supervisors:

1. Dr. Peter Bukhala - Department of Sports Science & Health Promotion- MMUST
2. Dr. Mary Kipmerewo - Department of Reproductive Health - MMUST
3. Dr. Zachary Kwena - KEMRI - Kisumu

You are required to submit through your supervisor(s) progress reports every three months to the Director of Postgraduate Studies. Such reports should be copied to the following: Chairman, School of Public Health Graduate Studies Committee and Chairman, Department of Sports Science and Health Promotion. Kindly adhere to research ethics consideration in conducting research.

It is the policy and regulations of the University that you observe a deadline of Three years from the date of registration to complete your PhD thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

Yours Sincerely,

Prof. John Obiri
DIRECTOR DIRECTORATE OF POSTGRADUATE STUDIES

Appendix VIII; IERC approval

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

Tel: 056-31375
Fax: 056-30153
E-mail: rel@mmust.ac.ke
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P. O. Box 190
Kakamega
50100
Kenya

Institutional Ethics Review Committee (IERC)

MMU/COR: 403012 vol 2(6)

13th February, 2018

Gregory Okonya Sakwa
Registration No. HPS/LH/002/2015
Masinde Muliro University of Science and Technology
P. O. Box 190-50100
KAKAMEGA

Dear Mr. Sakwa,

RE: ETHICAL APPROVAL TO CONDUCT RESEARCH

The IERC received your proposal titled "***Integrating uptake of cervical Cancer screening in community strategy in Kakamega County, Kenya***". The IERC, MMUST chapter therefore grants ethical clearance for you to conduct your research as proposed. In case of any adverse reactions to the patients, please report to IERC, MMUST.

On behalf of IERC and the University Senate, receive my congratulations. We wish you success in your research endeavour.

Yours faithfully,

Dr. Nguka Gordon
Chairman, Institutional Ethics Review Committee

Copy to:

- The Secretary, National Bio-Ethics Committee
- Vice Chancellor
- DVC (PR&I)
- DVC (A & F)
- DVC (A&SA)

Appendix IX; Research License

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and Innovation
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Website: www.nacosti.go.ke

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 21720

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MR. GREGORY OKONYA SAKWA
of MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY, 190-50100 Kakamega,has been permitted to conduct research in *Kakamega County*

on the topic: *INTEGRATING UPTAKE OF CERVICAL CANCER SCREENING IN COMMUNITY STRATEGY IN KAKAMEGA COUNTY, KENYA*

for the period ending:
1st November,2019

.....
Applicant's Signature

Permit No : NACOSTI/P/18/33132/26062
Date Of Issue : 3rd November,2018
Fee Recieved :Ksh 2000

.....
Director General
National Commission for Science, Technology & Innovation