DETERMINANTS OF CERVICAL CANCER SCREENING UPTAKE AMONG WOMEN
IN EMBU COUNTY, KENYA

BY:

NTHIGA ANNE MURUGI; B.A SOCIAL WORK

DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR A MASTER OF PUBLIC HEALTH DEGREE OF THE UNIVERSITY OF NAIROBI.

NOVEMBER 2014

DECLARATION

I declare that this study is my original work and has not been submitted for a degree award in this or any other university. All resources contained herein have been duly acknowledged.

Signature: ………………………….   Date: …………………………………..

Name: Anne Murugi Nthiga

Registration number: H57/63954/2010

APPROVALS

This dissertation has been submitted with our approval as university supervisors:

Signature: …………………………………………...   *Date………………………………………*

Prof. Olenja Joyce. B.Ed., Mphil, PhD.

Signature: …………………………………………..   *Date………………………………………*

Dr Richard Ayah. M.B.Ch.B, M.Sc.,

DIRECTOR SCHOOL OF PUBLIC HEALTH

Signature………………………………………….   *Date………………………………………*

Dr Dismas Ongore. M. B. Ch. B, MPH, PhD

DEDICATION

This dissertation work is dedicated to my husband and friend, Stephen Muchiri, for his encouragement and unwavering support throughout the period of my study. I am truly thankful for having you in my life. This work is also dedicated to my late daughter, Jeanette Wambui, thanks for the smiles and for the time I spent with you.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ASR	Age standardized Rate
CHW	Community Health Worker
FP	Family Planning
HIV	Human Immunodeficiency Virus
HPV	Human Papillomavirus Virus
IARC	International Agency for Research on Cancer
KNBS	Kenya National Bureau of Statistics
KNH	Kenyatta National Hospital
MNCH	Maternal and Neonatal Child Health
MTRH	Moi Teaching and Referral Hospital
NCD	Non-Communicable Diseases
PAP SMEAR	Papanicolaou Smear Test
SSA	Sub Saharan Africa
UoN	University of Nairobi
VIA/VILI	Visual Inspection with Acetic Acid/Visual Inspection with Lugols Iodine
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

Cervical cancer/cancer of the cervix: Cancer that forms in tissues of the cervix (the organ connecting the uterus and vagina).

Screening: Screening refers to the use of simple tests across a healthy population in order to identify individuals who have disease, but do not yet have symptoms.

Screening uptake: Refers to the proportion of persons eligible to be screened within a population who have ever been screened for cervical cancer.

Determinants: Factors that significantly influence the uptake of screening for different diseases. In this study determinants refers to factors that influence uptake of cervical cancer screening.

Household: A household includes all the persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied as separate living quarters. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements.

ABSTRACT

Cervical cancer is the fourth most common cancer affecting women worldwide. In 2012, it was estimated that 529,409 new cases occurred globally, with 274,883 (52% of cases) dying. Of the total new cases annually, about 86% occur in developing countries. In Kenya, 2454 new cases of cervical cancer and 1676 deaths occur annually. Cervical cancer is however one of the most preventable non- communicable diseases through screening .In Kenya screening uptake is low at just 3.2%. The main objective of the study was to determine factors associated with cervical cancer screening uptake among women in Embu County.

The study was a cross-sectional study .A multi-stage cluster sampling technique was used to obtain the required sample size of 269. The study was approved by the Kenyatta National Hospital-University of Nairobi Ethics Review Committee. The study was conducted between January 2014 and March 2014. Descriptive analysis was done. Graphs and tables were used to summarize data and measures of associations were determined between uptake of cervical cancer screening and the predictor variables using Pearson's Chi-square.

The mean age of respondents was 35 years. A majority 66% were married. A majority, 82.2% were aware of cervical cancer and 73.2% of cervical cancer screening. Only 25% of the women had ever been screened. Majority of the women 85.9% and 77% respectively reported little understanding of cervical cancer and lack of information as barriers to cervical cancer screening respectively. Significant associations were found between employment status and screening uptake (P=0.05), awareness of cervical cancer, awareness of cervical cancer screening and screening uptake (P=0.000).

The study shows that the uptake of cervical cancer screening was low among the women in Embu County. This shows that awareness of cervical cancer and cervical cancer screening has not translated to uptake of screening.

There is need therefore to put more emphasis on educating and creating awareness among communities about cervical cancer, signs and symptoms and the modes of prevention.

CHAPTER ONE: INTRODUCTION

1.1: Background

Cancer is the leading cause of death worldwide and accounted for 8.2 million deaths in 2012. More than half of all cancers (56.8%) and cancer deaths (64.9%) occurred in low and middle income countries. Projections based on the GLOBOCAN 2012 estimates predict a substantive increase to 19.3 million new cancer cases per year by 2025, due to growth and ageing of the global population (WHO 2013). More than 30% of cancer deaths can be prevented and with adequate investments in prevention control strategies, the morbidity and mortality rates attributable to cancers can be significantly reduced (WHO fact sheet no.297, Feb 2011).

Cervical cancer is the second most common cancer among women worldwide and is the leading cause of cancer deaths in developing countries. In 2008, it was estimated that 529,409 new cases occurred globally, with 274,883 of the women (52% of cases) dying. Of the total new cases each year, about 86% occur in developing countries, where unfortunately 80-90% of cervical cancer related deaths occur (GLOBOCAN 2008). With the peak age of cervical cancer being 35-45 years of age, it claims the lives of women in the prime of their life when they may be raising children, caring for the family, and contributing to the social and economic life of their community.

Cervical cancer is however easily detectable and curable in its early stages. Unfortunately, only 5% of women in developing countries undergo screening for cervical cancer compared to over 40% in developed countries, and 70% or higher in countries that have shown marked reduction in incidence and prevalence of cervical cancer. It is therefore not surprising that in Africa, where screening rates are very low the majority of women present at late stages with invasive and advanced disease.

In sub-Saharan Africa (SSA) the magnitude of the problem has been under-recognized and under prioritized compared to competing health priorities such as HIV& AIDS, tuberculosis and malaria. In sub-Saharan Africa, 34.8 new cases of cervical cancer are diagnosed per 100,000 women annually and 22.5% per 100,000 women die from the disease (WHO 2013). This is due to lack of epidemiological data and poor awareness, lack of human and financial resources, non-existent cancer service policies and lack of political will to address the complex problem (Denny et al. 2006; Parkin et al. 2008).

Cervical cancer in Kenya

In Kenya, cervical cancer is the second most frequent cancer among women and the leading cause of cancer deaths in women of reproductive age. Currently, the estimated annual number of cervical cancer cases is 2454 while the annual number of deaths due to cervical cancer is 1676 in Kenya. It is projected that by the year 2025, the number of new cervical cancer cases annually in Kenya will reach 4261 (WHO, 2010). Data from hospital-based registries in Kenya indicated that cancer of the cervix accounted for 70-80% of all cancers of the genital tract and 8-20% of all cancer cases for the 10-year period of 1981 to 1990. It has been reported that there are 10 to 15 new cases of cervical cancer in Nairobi each week (Kenya Cancer Registry, 2006). Despite the magnitude of the problem in Kenya and the fact that it is easily preventable, the cervical cancer screening coverage in Kenya for all women 18 to 69 years of age is only 3.2% (WHO, 2010).

Cancer is predicted to be an increasingly important cause of morbidity and mortality in the next few decades, in all regions of the world. The challenges of tackling cancer are enormous and when combined with an increase in the ageing population, increases in cancer prevalence are inevitable regardless of current or future actions or levels of investment.

The forecasted changes in population demographics in the next two decades mean that even if current global cancer rates remain unchanged, the estimated incidence of 12.7 million new cancer cases in 2008 (Farley J et al, 2008) will rise to 21.4 million by 2030, with nearly two thirds of all cancer diagnoses occurring in low- and middle-income countries (IARC 2011).

Data sources:
IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.
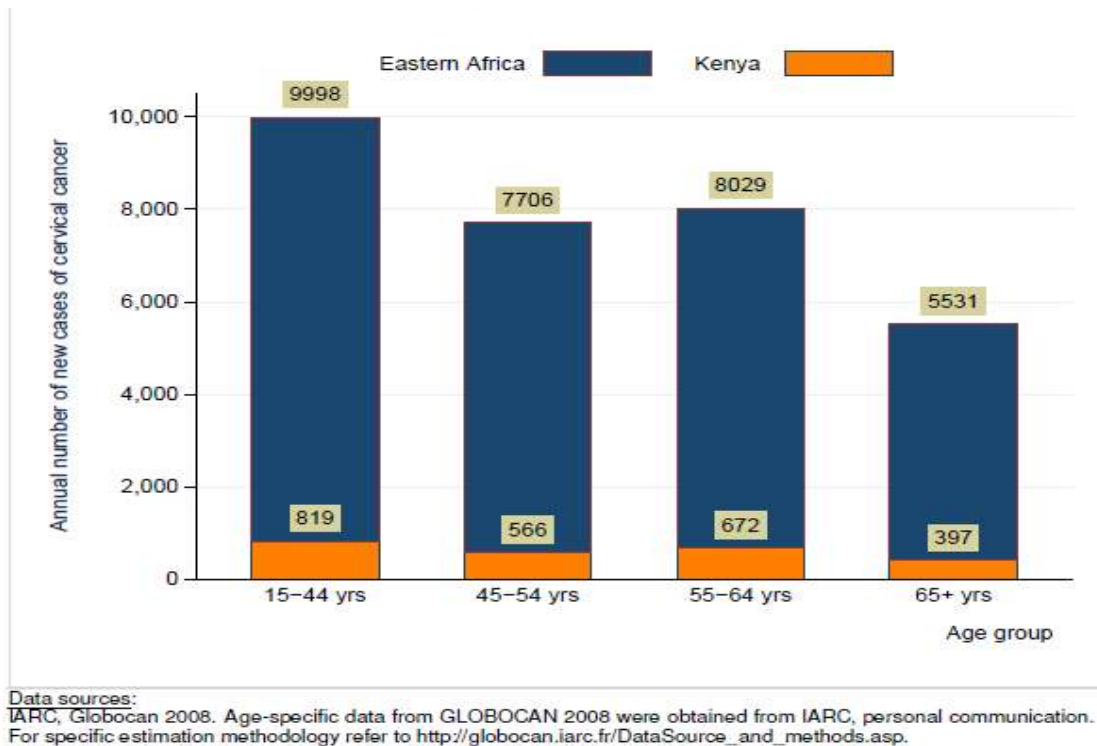
Figure 1: Annual number of cases of cervical cancer by age group in Kenya and Eastern Africa

1.2   Signs and symptoms of cervical cancer

In the early stages of cervical cancer, there are rarely any signs or symptoms but it can be diagnosed in this stage by routine screening.

As cervical cancer progresses into more advanced stages, symptoms begin to appear. Some of the symptoms include: pelvic pain, pain during sexual intercourse, abnormal vaginal bleeding, and vaginal discharge.

The fact that cervical cancer is asymptomatic in the early stages can partly explain why most patients have advanced disease at the time of diagnosis especially in countries where the screening services are rare.

The other problem is that the symptoms of cervical cancer mimic infections like vaginitis and pelvic inflammatory disease. It is thus common to find a woman with cervical cancer receiving treatment for pelvic inflammatory disease in the hands of general practitioners. Some patients then buy over the counter medicines in an attempt to manage "menstrual problems", without going for a proper check up (Gillet E at al. 2012) All these factors coupled with poverty, ignorance and lack of nearby services impact on cervical cancer prevention and management.

1.3   Risk factors for infection with cervical cancer

i.   **Human Papillomavirus:** The most important risk factor for cervical cancer is infection by the human Papillomavirus (HPV). The sub types most frequently associated with cervical cancer are HPV 16 and 18. Human Papillomavirus is a sexually transmitted infection (WHO fact sheet no.380, Sept 2013).

ii. **Poverty:** Women who are poor may not have access to medical services that detect and treat precancerous cervical conditions. When such women develop cervical cancer, the disease usually remains undiagnosed and untreated until it has spread to other parts of the body. Women who are poor are often undernourished, and poor nutrition is thought to increase cervical cancer risk (Abdulahi A et al, 2009).

iii. **Tobacco use:** Women who smoke are about twice as likely to develop cervical cancer as women who do not. The more a woman smokes - and the longer she has been smoking - the greater the risk (WHO fact sheet no.297, Feb 2011)

iv. **Number of sexual partners:** The more the number of sexual partners the higher the risk of infection with HPV.

v.   **Family history of cervical cancer:** Cervical cancer may run in some families. If a woman's mother or sister has or had cervical cancer, then one's chance of developing the disease is 2 to 3 times higher than if no one in the family had it.

vi. **Eating habits:** A diet that doesn't include ample amounts of fruits and vegetables can increase a woman's risk of developing cervical cancer.

vii. **Weakened immune system:** A woman whose immune system is weakened has a higher than average risk of developing cervical lesions that can become cancerous. This includes women who are HIV-positive.

Human immunodeficiency virus (HIV), the virus that causes AIDS, damages the body's immune system and places women at higher risk for HPV infections. This may explain the increased risk of cervical cancer for women with AIDS. It also includes women who have received organ transplants and must take drugs to suppress the immune system so that the body will not reject the new organ (Grulich et al, 2007).

viii. **Hormonal medications:** Some experts suggest that hormones in oral contraceptives (birth control pills) make women more susceptible to Human Papillomavirus (Moreno et al ,2002**)**

1.4   Common complications of cervical cancer
  i.   Infertility

Women who have advanced or invasive cervical cancer have a high risk of becoming infertile. Infertility is a cervical cancer complication characterized by the inability to become pregnant. One of the most common treatments for cervical cancer is hysterectomy-a surgical technique involving the removal of cervix and uterus thus these women are unable to bear children

  ii.   Treatment Side Effects

Cervical cancer treatments, such as chemotherapy, radiation and surgical procedures, can cause side effects in women. Chemotherapy and radiation can lead to adverse side effects that include skin irritation, vaginal dryness, nausea, vomiting, diarrhea, hair loss, recurrent infections or severe fatigue. Surgical or radiotherapy cancer treatment options can lead to complications involving bowel or bladder function. These cervical cancer complications of treatment can be uncomfortable and may have a significant impact on a woman's daily life and activities.

1.5   Problem statement

In Kenya, Cervical cancer is the second most common form of cancer among women aged 15-69 years after breast cancer. The country has a population of 10.32 million women ages 15 years and older who are at risk of getting HPV infections and developing cervical cancer (WHO 2010). Current estimates indicate that every year in Kenya, 2454 new cases of cervical cancer are reported and 1676 deaths from the disease (WHO 2010).

Cervical cancer is easily preventable before onset by vaccination with the HPV vaccine. Cervical cancer can also be prevented through routine screening of women to identify any abnormal cells in the cervix. Screening is available in most of the Kenyan health facilities using both VIA/VILI and also through Pap smear.

However, screening levels remain low at just 3.2 percent of among women aged 18-69 years compared with 70 percent of women in the developed world (WHO 2010).

1.6   Justification

The morbidity and mortality of cervical cancer can be highly reduced through regular screening and timely intervention upon finding abnormal cells. The Kenyan Government has made tremendous efforts in trying to incorporate screening programs in the regular HIV care and also recently has come up with the national cervical cancer prevention plan focusing on primary prevention, screening and early detection and treatment (National cervical cancer prevention plan 2012-2015). In spite of all the efforts put in place for cancer screening by the Ministry of Health, the uptake still remains low.

The findings and recommendations of this study will provide valuable information to the Ministry of Health and other stakeholders in addressing issues of screening uptake and the common barriers to screening among women in the rural communities.

1.7   Conceptual Framework

PREDISPOSING FACTORS   ENABLING FACTORS   OUTCOME

| Age |
| Marital Status |
| Religion |
| Number of children |
| Level of education |
| Level of income |
| Employment status |

| Awareness of cervical cancer |

| Knowledge of cervical cancer signs and symptoms |

| Knowledge of cervical cancer risks factors |

| Awareness of cervical cancer screening |

| Embarrassment
Not feeling at risk
Social support
Tradition/customs
Accessibility (Cost of screening, Time)
Availability |

| **Uptake of cervical cancer screening**

Reduced morbidity and mortality due to cervical cancer |

Figure 2: Conceptual framework

1.8   Objectives

Broad objective

To determine the factors associated with cervical cancer screening uptake among women in Embu County

Specific objectives

1. To determine the level of cervical cancer awareness among women in the community

2. To assess knowledge of cervical cancer screening among the respondents

3. To determine the uptake of cervical cancer screening among the respondents

4. To determine the socio-demographic factors associated with uptake of cervical cancer screening

5. To determine barriers to cervical cancer screening uptake

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview of cervical cancer screening

Cervical cancer is one of the leading causes of cancer deaths in women in the developing countries (WHO Fact sheet, 2006). The primary underlying cause of cervical cancer is infection with Human Papillomavirus (HPV, a very common virus that is sexually transmitted. Effective interventions against cervical cancer exist, including screening and treatment. Screening aims at detecting infection with HPV and precancerous cells.

An estimated 96% of women in developing countries have never been screened for cervical cancer and over 80% of women newly diagnosed with cervical cancer live in developing countries; mostly diagnosed when they have advanced disease (WHO Fact sheet, 2006).

In most developing countries screening is mainly opportunistic, characterized by an estimated low coverage, poor access to health facilities and an absence of quality control procedures. Policies for cancer screening vary in most countries. In Kenya, there exists a National Cancer Control Strategy 2011-2016. The aim of the strategy is to build on the existing health system in Kenya to strengthen cancer prevention and control capacities; both in public and private sectors through control of risk factors associated with cancer, investment in cancer control workforce, equipment and through cancer research.

Formulation and ensuring compliance with national program guidelines is an essential step toward significantly reducing the burden of cervical cancer (Arrosi et al. 2010). This type of service does not reach women most at risk that is older women aged 35–60 years, especially those who live in rural areas. Cytology-based screening, which is predominantly used in developed countries, is resource intensive, and difficult to realize in very many countries in sub-Saharan Africa because of poor health care infrastructure and lack of resources.

2.2   Factors related to cervical cancer screening uptake

Several factors influencing cervical cancer screening have been reported. They include; lack of awareness, age and marital status, inadequate access to healthcare facility due to poor infrastructure, unawareness among the health care providers in rural areas regarding importance of early diagnosis and treatment (Singh S, Badaya S, 2012).   Other factors include; existence of alternative medicine, deficient economic and moral support from husband and family and an inappropriate demand for providing cervical cancer screening from the potential beneficiaries (Basu P, Chowdhury D, 2009).

2.2.1   Demographic characteristics

Demographic characteristics include education, age, and marital status. With regards to education level, several studies have found that women with high screening rates have a high level of education (Liao C C et al 2006; Fernández JV et al 2009). However, women with high education may not necessarily seek screening (Abotchie PN, Shokar NK 2009); thus, additional factors must be considered. Regarding age rates of screening are substantially lower in younger women aged 20-29 years and elderly women aged 60 years and above [Liao C C et al 2006, Cyril CD et al 2009]. A study done in Kenya on risks and barriers to cervical cancer screening among 219 women attending MNCH-FP clinic at the Moi teaching and referral hospital (MTRH) found that only 12.3% of the participants had ever been screened. In this study, women over 30 years were more likely to have screened for cervical cancer than younger women (Were E, et al., 2012).   With regards to marital status studies have found that unmarried and widowed women are less likely than married women or women living with a partner to obtain screening (Liao C C et al 2006). In addition, some studies have found that single women are more likely than married women to have pap screening (Cyril CD et al 2009, Singh KK et al 1998).

2.2.2 Level of knowledge

Women's knowledge on cervical cancer and its risk factors has been listed as a key factor in influencing uptake of screening. Women with low levels of knowledge about cervical cancer and its prevention are unlikely to access screening services.

A study by Lyimo & Beran, 2012 done in Moshi Tanzania looking at the most important factors related to the uptake of screening among 354 women aged between 18 and 69 revealed that, more than half (59.6%) of the participants had a low level of knowledge of cervical cancer and its prevention. In this study only 80 (22.3%) women reported having been screened. The study also showed that those with the highest level of knowledge about cervical cancer and its prevention were more likely to be screened than those with low or medium level of knowledge (Lyimo and Beran, 2012).

In another study in Ghana by Abotchie PN and Shokar NK among college students on knowledge and health beliefs on cervical cancer there were gaps in knowledge about risk factors and screening intervals. Human papillomavirus is the most important risk factor for developing cervical cancer according to the American cancer society yet only 7.9% of the participants in this study knew about HPV (Abotchie PN, Shokar NK 2009).

In Kuwait, a study whose objective was to assess the knowledge, attitude and practice regarding cervical cancer screening found out that of the 300 married randomly selected women, only 30.6% and 23.6% had adequate attitude and practice towards the test respectively (Mona A, and Farida A, 2009).

The Kuwait study also revealed that the main reason for not having a Pap test was because it had not been suggested by the doctor. This shows that women have limited knowledge on the importance of the screening test.

In Bangladesh, a qualitative study on community perceptions of cervical cancer and cervical cancer screening among 220 men, women and children found out that awareness of cervical cancer was widespread among the community but knowledge on its causes was inadequate (Ansink, A. C et al 2008).

Another study involving 356 women from Mutoko and Shurugwi district in Zimbabwe, (Mungoma, J.F., et al 2007), found that 95.8% of the women interviewed had never gone for screening and had little knowledge about the various aspects of cervical cancer causes, prevention and treatment. Sensitization of women about available services is therefore necessary in low resource settings.

In Uganda, a study on influences on uptake of reproductive health services in Nsagi community and their implications for cervical cancer screening found ignorance about cervical cancer risk factors as one of the major barriers to screening uptake (Mutyaba, T et al., 2007). A study among 310 medical workers on knowledge, attitudes and practices on cervical cancer screening in Mulago Hospital, Uganda found that less than 40% of the respondents had knowledge of the risk factors for cervical cancer. In this study 81% of the respondents had never been screened for cervical cancer (Mutyaba, T et al 2006). In Kenya a study done at the Kenyatta National Hopsital(KNH) found that about half (51%) of the participants were aware of cervical cancer and only 32% knew about Pap smear testing. There were no significant differences in knowledge between cervical cancer and non-cancer patients. In this study only 22% of all the participants had ever been screened (Gichangi et al., 2003).

Women who have had an awareness of cervical cancer are more likely to have screened for cervical cancer. For instance in a cross- sectional study done in Kenya among 384 female primary school teachers on awareness of cervical cancer risk factors and practice of Pap smear testing 87% of the women were aware about cervical cancer and 75% knew about the Pap smear test. It is important to note that only about 39% knew that HPV infection was a risk factor for cervical cancer and only 41% had been screened before (Ombech E, et al 2012).

Another study done in Thika among 498 women on factors affecting uptake of cervical cancer, lack of awareness of cervical cancer and the benefits of early detection measures were reported as critical barriers to screening. In this study, about 17.3% of the women had ever gone for cervical cancer screening (Ngugi, C.W, et al 2012).

2.2.3   Socio-cultural factors

Several socio-cultural factors are associated with low uptake of cervical cancer screening services. They include myths/perceptions surrounding the disease and test, women's lack of autonomy and ability to make decisions, lack of social support and traditions/customs that are still practiced in the communities. For instance, men are considered to be the leaders of the family and since the women lack autonomy in terms of decision making then perhaps negative attitudes among the male partners, who may serve as key decision-makers, prevent women from seeking screening services (Singh KK et al 1998). The role of men may thus, be important in determining women's access to screening for cervical cancer.

Regarding myths, a qualitative study in Bangladesh on community perceptions of cervical cancer and cervical cancer screening among 220 men, women and children found out that most women and men would not be willing to accept the Pap smear unless it was done by a female healthcare provider in an environment with sufficient privacy (Ansink, A C., et al 2008). Also, in a study of Somali women in Camden London, women developed a negative outlook on screening due to embarrassment associated with female genital mutilation (Abdullahi A et al 2009).

Other cultural barriers may lead to negative opinions about screening including concern about exposure of private body parts (Hummeida M, et al 2009). The gender of the health worker who performs the Pap smear test, therefore, may be important as women may prefer one who is female (Bener A,et al 2001).

A study carried out in Nigeria among 846 women in Owerri, South -Eastern Nigeria established that 52.8% of the women had heard about cervical cancer and only 7.1% had ever done a Pap smear. In this study, 11.6% of the respondents reported fear of positive results as a reason for not taking the Pap smear test (Ezem, B.U 2007). A study in Uganda also found that cultural constructs and beliefs about cervical cancer was among the major barriers for screening (Mutyaba T, et al., 2007).

2.2.4   Socio-economic factors

Studies have found that the clash of economic activities with clinic appointment times can lead to low uptake of cervical cancer screening. Poverty is also one of the factors associated with low uptake since the cost of screening has been found to be high. For instance a study in Camden London among ethnic Somali women found that the clash of clinic appointment time with market days and child care needs were associated with low uptake of screening (Abdulahi, A et al., 2009).

In Kenya a study done in Eldoret at the Moi teaching and referral hospital found that 11.4% of the participants lacked the finances to pay for the test and they identified this as the reason they do not go for screening. The study was conducted among 219 women attending the MNCH-FP clinic at the hospital (Were E, et al., 2012).

A study by Ansink et al in Bangladesh also reported the high costs of screening services as one of the most common barriers to screening (Ansink, A. C et al., 2008). Cost has also been mentioned as a key determinant to accessing services in Uganda (Mutyaba T, et al., 2007).

2.2.5 Accessibility

Long distances to the cervical cancer screening services reduce the likelihood of women accessing screening (Jo W et al 2009). A cross-sectional, community-based survey revealed that poor transportation is an additional problem (Bener, A. et al 2001).

In Bangladesh, a study on community perceptions of cervical cancer and cervical cancer screening among 220 men, women and children found that low priority for seeking help for symptoms, limited availability of health services were among the most common barriers to screening (Ansink, A. C et al 2008).

CHAPTER THREE: METHODOLOGY

3.1   Study Design

This was a descriptive cross-sectional study on factors influencing cervical cancer screening knowledge and uptake among women in Embu County. The study was carried out over a period of two months (from 5th January to 5th March, 2014) following approval from KNH/UON-ERC.

3.2   Study Area

The study was conducted in Embu County, Kenya. The County comprises four Sub- Counties namely Manyatta, Runyenjes, Mbeere South and Mbeere North. Located in Eastern Kenya, it borders the following counties; Tharaka Nithi to the North, Kitui to the East, Machakos to the South, Murang'a to the South West, Kirinyaga to the West, and Meru to the North West. The county has an area of approximately 2,818 square kilometers (KNBS 2009).

The total population of the county is 543,221 (Male – 49 %, Female – 51 %) as per the 2012 Kenya national housing census projections with an estimated annual growth rate of 1.7%. The population density is 183 people per Km^2. The age distribution is 0-14 years (37.5 %), 15-64 years (57.3 %), 65+ years (5.2 %). The county has a total of 131,683 households. There are 133 health facilities in total ; Provincial General Hospital (1), District Hospitals (2), Sub-District Hospitals (2), Dispensaries (74), Health Centers (12), Medical Clinics (34), Nursing Homes (2), Maternity Home (1), Others (5) . The Doctor to population ratio is 1:10,474 (KNBS 2009).

3.3   Study population

The study population was women aged 18 and above years, who had resided in the County for more than three months prior to the study to establish their knowledge on cervical cancer screening and their uptake of screening.

3.4   Inclusion criteria

All women aged 18 and above years and who gave consent to participate in the study.

All women who had lived in Embu County for more than 3 months

3.5   Exclusion Criteria

Those who did not give consent to participate

3.6   Sample selection

Embu County was purposively selected. The County is made up of four Sub- Counties namely Manyatta, Runyenjes, Mbeere South and Mbeere North. Multistage cluster sampling technique was employed to select eligible study participants. There are 20 county assembly wards (Locations) in the four Sub-Counties and the locations divided into 109 sub-locations. Ten (10) county assembly wards were randomly selected through simple random sampling; and within the country assembly wards, a sample of thirty eight (38) sub-locations were again selected using simple random sampling. For each sub-location, seven (7) households were randomly selected. One (1) woman aged 18 and above was recruited to participate in the study. This was done until the desired sample size was achieved. The sampling frame is attached; Appendix 1.

3.7   Sample size

The appropriate sample size was calculated using Fisher's formula (Mugenda and Mugenda 2003) based on 95% confidence interval and assuming the uptake of cervical cancer screening of 22.3% based on data from a previous study on a similar population in Moshi, Tanzania (Lyimo and Beran 2012).

Formula:

$$n = \frac{Z^2\,([P\,(1 - P)]}{d^2}$$

n = the required sample size

Z = the critical value associated with the level of significance

P = the estimated Sero-prevalence (0.223)

d = degree of precision chosen for the study

Z = 1.96 for 95% level of confidence

P = 0.223

d = 0.05 degree of precision

$$n = \frac{1.96^2\,[(0.223\,(1 - 0.223)]}{0.05^2}$$

Therefore the desired sample size was 266.

3.5 Data collection techniques and tools

Three (3) research assistants were recruited to assist in the data collection. These research assistants were holders of at least a bachelor's degree in health related courses. They were trained by the principal investigator on the study tool, the aims and objectives of the study as well as the ethical considerations, how to conduct questionnaire interviews (interviewer administered questionnaire) to minimize information bias. Permission to conduct the study was sought from the local administration of the county. After an explanation of the purpose of the study and obtaining written consent from the participants the data collection was started. The research assistants introduced themselves to the participants and underscored that their participation was voluntary and that they would not be victimized in any way. Confidentiality was assured by ensuring that their names did not appear anywhere in the questionnaire.

3.6 Data Quality assurance

Before data collection, the questionnaire was pre-tested in Gathoge, a town in Kirinyaga County bordering Embu County among women aged 18 years and above. The questionnaire was then revised to ensure it collected information to answer the research objectives. Research assistants were trained prior to data collection. In addition the questionnaires were checked daily for completeness and consistency by before data entry was done.

3.7   Data Management and analysis

For ease of data entry, each question was coded. Data was entered directly into SPSS version 17 and analyzed. Simple frequencies were run to determine socio-demographic characteristics of the respondents. Awareness of cervical cancer and knowledge of signs and symptoms were determined. Uptake of screening of cervical cancer were determined as well as the barriers to screening.   Bivariate analysis was conducted to examine possible associations between uptake of cervical cancer screening and the predictor variables (socio-demographic characteristics, awareness of cervical cancer screening, knowledge of symptoms of cervical cancer and knowledge of prevention of cervical cancer). This was done using Pearson's Chi Square. Association was considered significant when p-value was equal to 0.005. Results were presented in tables, bar charts, graphs and pie charts as appropriate.

3.8: Ethical considerations

- Ethical clearance was obtained from KNH/UON Ethics and Scientific Review Committee. Clearance was also sought from the local administration from the office of the chief in each of the locations.

- Each respondent gave written consent after introduction of the study by the principal investigator and the research assistants and participation was voluntary.

- Names of the respondents were not used to ensure anonymity and confidentiality. Questionnaires were given unique identifiers/codes during data entry and analysis..

- The results of this study will be shared with through feedback meetings with the Stakeholders in health in Embu County. A policy brief will be made available to the Embu County health management board.

3.9   Study Limitations

Data collection involved travelling to various remote villages in the locations where women were busy doing their daily activities and therefore scheduling appointments was not possible. These missed opportunities due to unavoidable circumstances lead to increased costs due to setting up of return visits. The investigator and the assistants ensured that the interviews for those women who were not available in the morning were done in the afternoon when most of them were at home. Return visits were also considered to ensure that there was adequate coverage.

The tool was not translated to the local language. This may have led to some misinterpretation of some of the questions or words by the research team. To mitigate this, local research assistants were used who understood the local language and they were also trained on how to ask the questions and probe where necessary.

The uptake of screening was self reported by the respondents and there was no way of verifying the responses. To mitigate this, a follow up question was asked as to when the last time screening had been done. The respondents were also asked to be truthful as the data would be used to plan future interventions in the study site.

CHAPTER FOUR: RESULTS

4.1 Socio- Demographic characteristics of the respondents

The mean age of the respondents was 35 years with a standard deviation of 12 years. Thirty seven point nine percent (n=102) of the respondents were between the ages 25-34 years. The mean parity was 2. The mean size of a household was 3, with a maximum of 11 persons per household.

A majority of the respondents, 66% (n=177) were married; twenty two percent (n=58) single and the rest of the respondents 12.6% (34) were separated, widowed or divorced.

Of all the women interviewed, 45.7% (n=123) had primary level education, 38.7% (n=104) had secondary level education, 11.9% had tertiary level education and 3.7% of the respondents had never been to school for any formal education.

A majority of the respondents, 75% (n=202) were protestants, with catholics consisting 24% (n=64) of the respondents.

The employment status of the respondents was also established and 60% (n=163) of the respondents were self employed, 15.2% (n=41) were employed either full time or part-time, while 24.2% (n=65) were not employed.

Most of the participants 42.7% (n=114) earned between 1000 and 5000 Kenya shillings per month, 30.7% (n=82) earned less than a 1000 and the remaining 26.6% earned between 5000 and 20,000 Kenya shillings.

The socio-demographic characteristics are summarized in the table below;

Table 1: Socio-demographic characteristics of the respondents

Characteristics	Classification	Frequency	Percent
Age in years	<25	51	19.0
	25-34	102	37.9
	35-44	64	23.8
	45-54	33	12.3
	55-64	12	4.5
	>64	7	2.6
	Total	269	100
Marital Status	single (never married)	58	21.6
	Married	177	65.8
	Separated	20	7.4
	Divorced	1	0.4
	Widowed	13	4.8
	Total	269	100
Education Level	Primary	123	45.7
	Secondary	104	38.7
	Technical College	30	11.2
	University	2	0.7
	None	10	3.7
	Total	269	100
Religion	Catholic	64	23.8
	Protestant	202	75.1
	Other	3	1.1
	Total	269	100
Employment status	Employed Fulltime	34	12.6
	Employed part time	7	2.6
	Unemployed	46	17.1
	Self-employed	163	60.6
	Full time home maker(house wife)	15	5.6
	Retired	3	1.1
	Others	1	0.4
	Total	269	100
Monthly income	Less than 1000	82	30.7
	1000-5000	114	42.7
	5000-10000	48	18
	10000-20000	17	6.4
	more than 20000	5	1.9
	Total	269	100

4.2 Cervical cancer awareness

4.2.1: Awareness of cervical cancer

Ever heard of cervical cancer

18%

82%

Yes
No
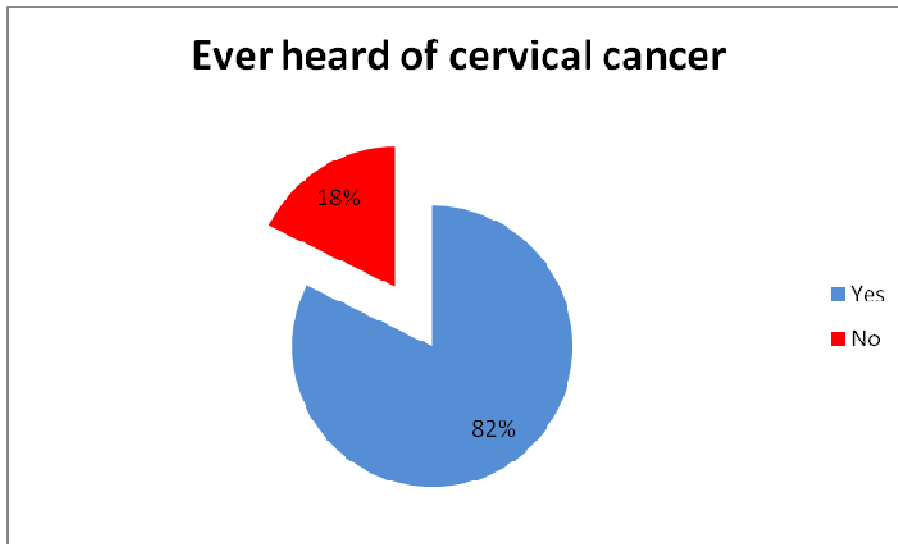
Figure 3: Awareness of cervical cancer among the respondents

The Majority of the respondents; 82.2% (n=221) had heard of cervical cancer, whereas 17.8% (n=48)

had never heard of cervical cancer.

.

4.2.2: Knowledge of signs and symptoms of cervical cancer

More than half of the respondents did not know that the signs and symptoms mentioned to them are

associated with cervical cancer.

Table 2: Respondent's knowledge of signs and symptoms of cervical cancer

Knowledge of signs of cervical cancer	Yes	No	Don't know
Vaginal bleeding between periods	31.6% (n=85)	10.4% (n=28)	58.0% (n=156)
Persistent lower back pain	24.2% (n=65)	12.3% (n=33)	63.6% (n=171)
Persistent vaginal discharge with unpleasant smell	32.7% (n=88)	10.0% (n=27)	57.2% (n=154)
Discomfort or pain during sex	25.7% (n=69)	9.7% (n=26)	64.7% (n=174)
Menstrual periods that are heavier or longer than usual	26.0% (n=70)	13.4% (n=36)	60.6% (n=163)
Persistent diarrhea	5.9% (n=16)	31.6% (n=85)	62.5% (n=168)
Vaginal bleeding after menopause	34.6% (n=93)	3.3% (n=9)	62.1% (n=167)
Bleeding during or after sex	29.0% (n=78)	7.4% (n=20)	63.6% (n=171)
Blood in stool or urine	17.8% (n=48)	20.1% (n=54)	62.1% (n=167)
Unexplained weight gain	15.2% (n=41)	21.2% (n=57)	63.6% (n=171)

Among the respondents, 31.6%   identified bleeding between menstrual periods as a sign of cervical

cancer. A slightly higher proportion 32.7%   identified presence of vaginal discharge that is smelly as

a symptom of cervical cancer. Similarly 34.6% and 29 % identified vaginal bleeding after menopause

and bleeding during or after sex respectively as symptoms of cervical cancer.

4.2.3: Ability to identify cervical cancer symptoms
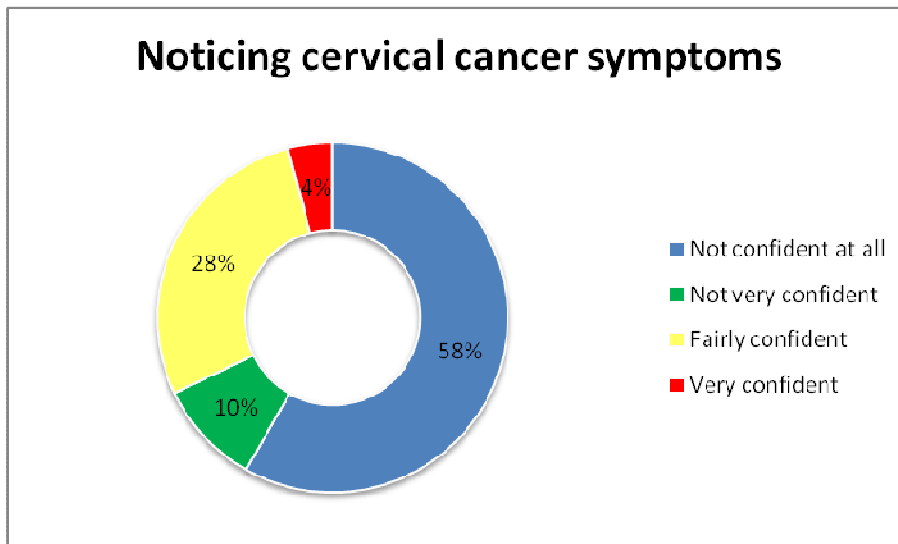
Figure 4: Ability to notice cervical cancer symptoms

The respondents who knew about cervical cancer signs and symptoms were asked if they could recognize symptoms of cervical cancer from the ones presented in table 2 above. Only 4% (n=11) were very confident that they would identify a symptoms of cervical cancer if they were affected. More than half of the respondents 58% (n=156) were not confident at all that they could identify a sign of cervical cancer.

4.2.4: Knowledge of cervical cancer risk factors

Table 3: Risk factors for cervical cancer

Risk factors of cervical cancer	Disagree	Not sure	Agree
Infection with HPV	5.6% (n=15)	70.6% (n=190)	**23.5**% (n=63)
Smoking cigarettes	14.1% (n=38)	51.7% (n=139)	**34.2**% (n=92)
Weakened immune system	13.1% (n=35)	58.6% (n=157)	**28.1**% (n=75)
Long-term use of contraceptives	10.04% (n=27)	49.4% (n=133)	**40.5**% (n=109)
Having STI's	9.3% (n=25)	53.2% (n=143)	**37.3**% (n=100)
Having an uncircumcised sexual partner	19.8% (n=53)	67.3% (n=181)	**12.7**% (n=34)
Having sex at an early age	15.7% (n=42)	59.9% (n=161)	**24.3**% (n=65)
Having multiple sexual partners	11.6% (n=31)	50.6% (n=136)	**37.7**% (n=101)
Having many children	31.2% (n=84)	58.7% (n=158)	**10.0**% (n=27)
Having a sexual partner with multiple partners	13.4% (n=36)	53.9% (n=145)	**32.7**% (n=88)
Not going for regular screening	11.9% (n=32)	52.8% (n=142)	**35.3**% (n=95)

Only 23.5% (n=63) were aware that infection with Human Papillomavirus (HPV) is a risk factor associated with cervical cancer. In addition, 32.4% (n=92) of the respondents identified cigarette smoking as a risk .Twenty eight point one percent (n=75) reported that -suppression of the immune systems due to infection with HIV and other conditions as a risk factor for cervical cancer. Majority of the respondents 40% (n=109) identified the long-term use of the oral contraceptive pill as a risk factor. Other risk factors identified by the respondents included: presence or history of sexually transmitted infections 37.3% (n=100), having an uncircumcised partner 12.7% (n=34), early sexual debut 24.3% (n=65), and having many sexual partners 37% (n=101).

The results are as shown in table 3 above:

4.3.: Knowledge of cervical cancer prevention

.
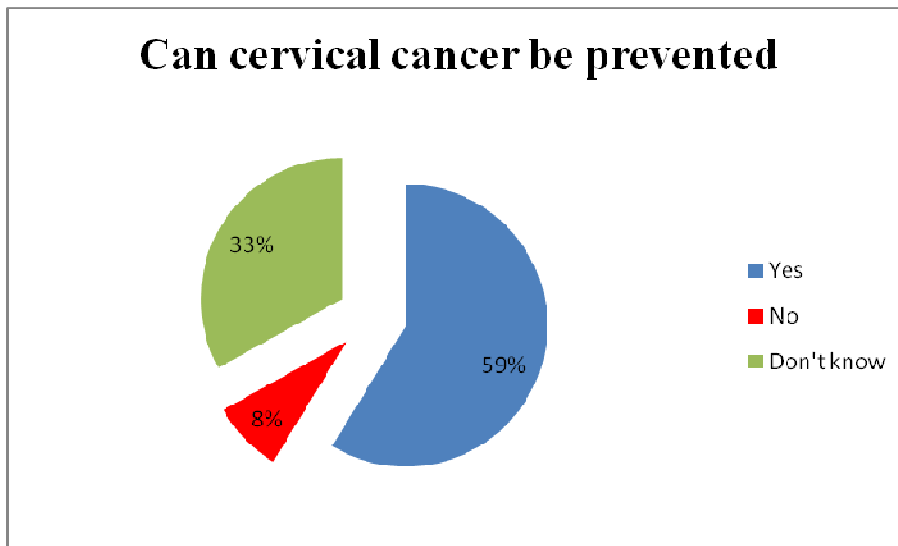
Figure 4: Knowledge of cervical cancer prevention

The respondents were asked if cervical cancer can be prevented. A majority 58.7% reported that cervical cancer can be prevented.

4.3.1: Modes of cervical cancer prevention
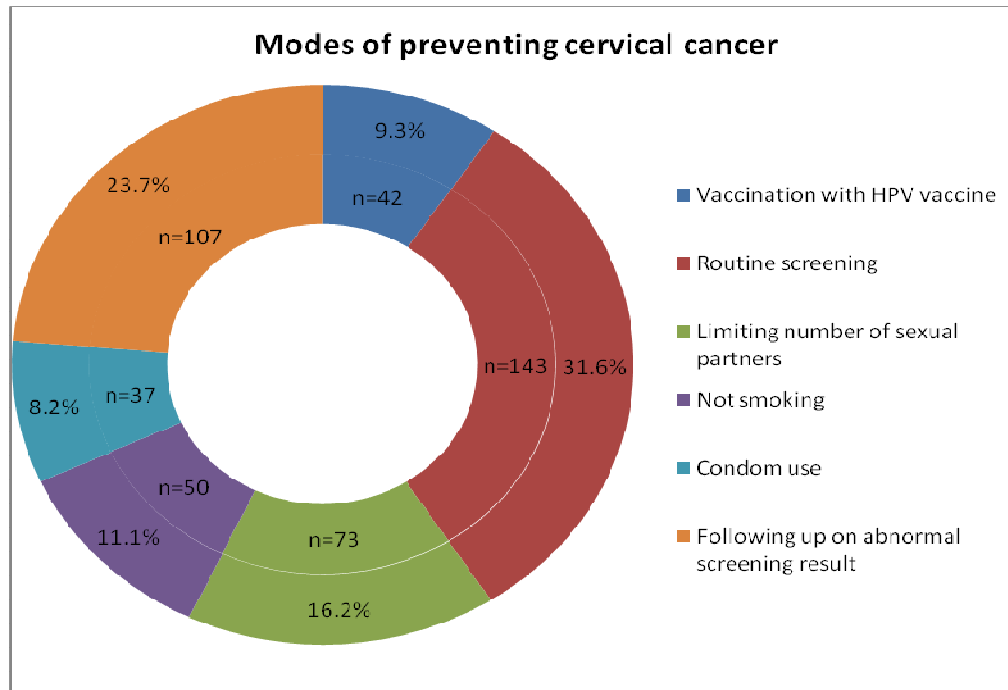
Figure 5: Modes of preventing cervical cancer

About 23% (n=107) reported that following up on screening results from the clinic and addressing any abnormal screening result early was a way of preventing the development of cervical cancer. The rest of the modes of prevention identified included: limiting the number of sexual partners 16.2% (n=73), not smoking 11.1% (n=50), vaccination with HPV vaccine 9.3% (n=42), using condoms consistently and correctly during intercourse 8.2 %(n=37).

4.3.2: Awareness of cervical cancer screening
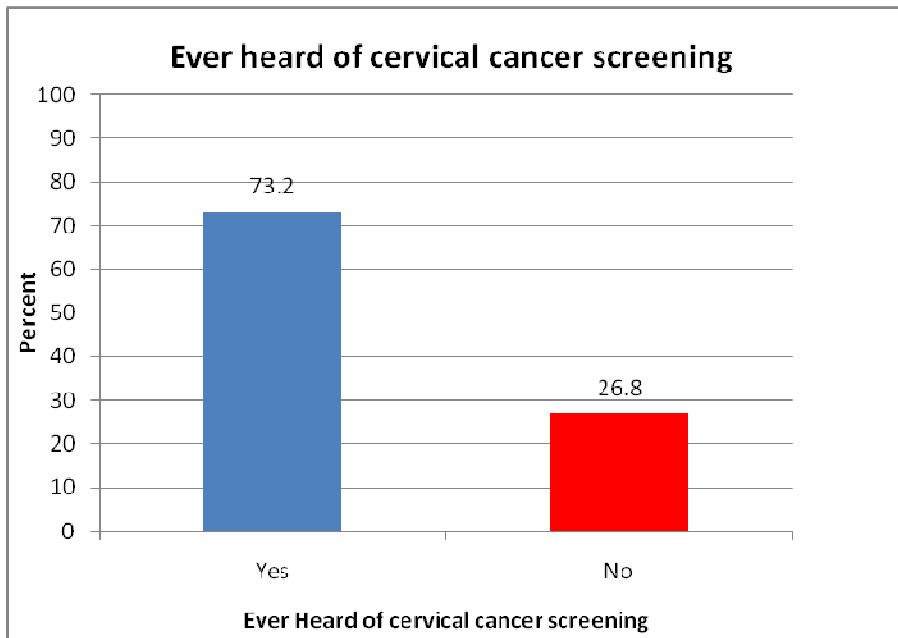
Figure 6: Awareness of cervical cancer screening

The majority of the participants 73.2% (n=197) had heard of cervical cancer screening. On the

contrast, 26.8% of the respondents had never heard of cervical cancer screening.

4.3.3: Source of information on cervical cancer screening
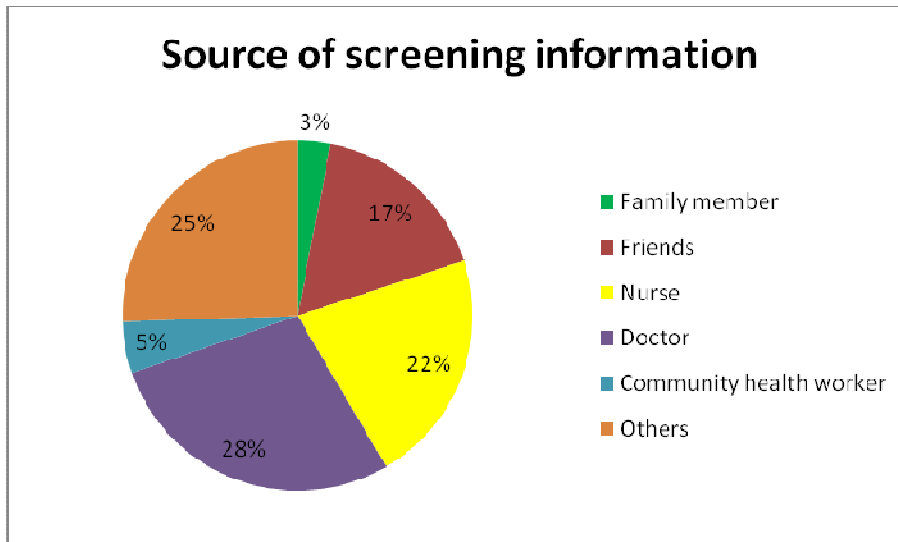
Figure 7: Source of information on cervical cancer screening

Most of the respondents reported to have gotten information on cervical cancer screening from a doctor (28% (n=65)). The other respondents got information on cervical cancer screening from a nurse (21.6% (n=50)); friends (17% (n=39)); community health workers (4.8% (n=11)) and family members (3% ((n=7)).Other respondents (25% (n=59)) reported their sources of information on cervical cancer screening to be awareness campaigns, church and school gatherings as well as media.

4.4: Cervical cancer screening uptake
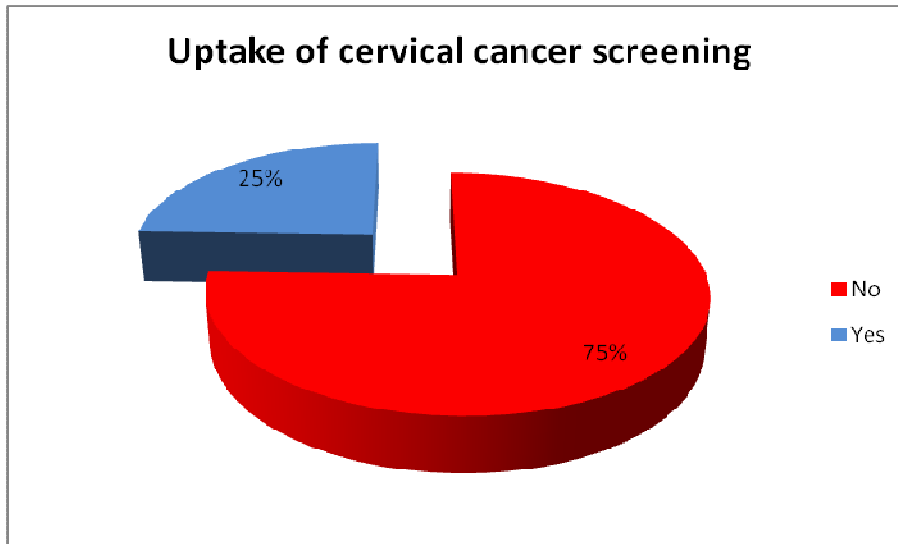
Figure 8: Uptake of cervical cancer screening

Cervical cancer screening uptake among the respondents was found to be 25% (n=67). Majority of the respondents had never been screened for cervical cancer.

4.4.1: Last time cervical cancer screening was done
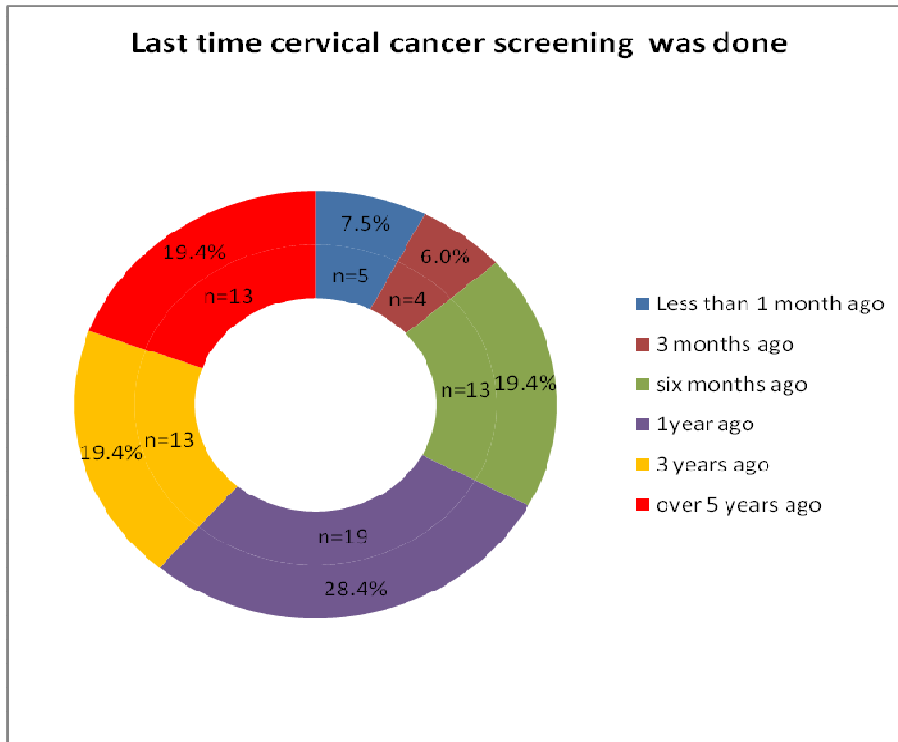
Figure 9: Last time respondents had cervical cancer screening done

Respondents who had had cervical cancer screening were asked to report the last day they were screened for cervical cancer. More than half of these respondents had had cervical cancer screening doe between 1-5 years ago as follows; 19.4% (n=13) had screening done over 5 years ago;19.4% (n=13) had screening done 3 years ago and 28.4% (n=19) had screening done 1 year ago. The rest had been screened for cervical cancer between less than a month and 6 months during the study period.

4.5: Barriers to uptake of screening
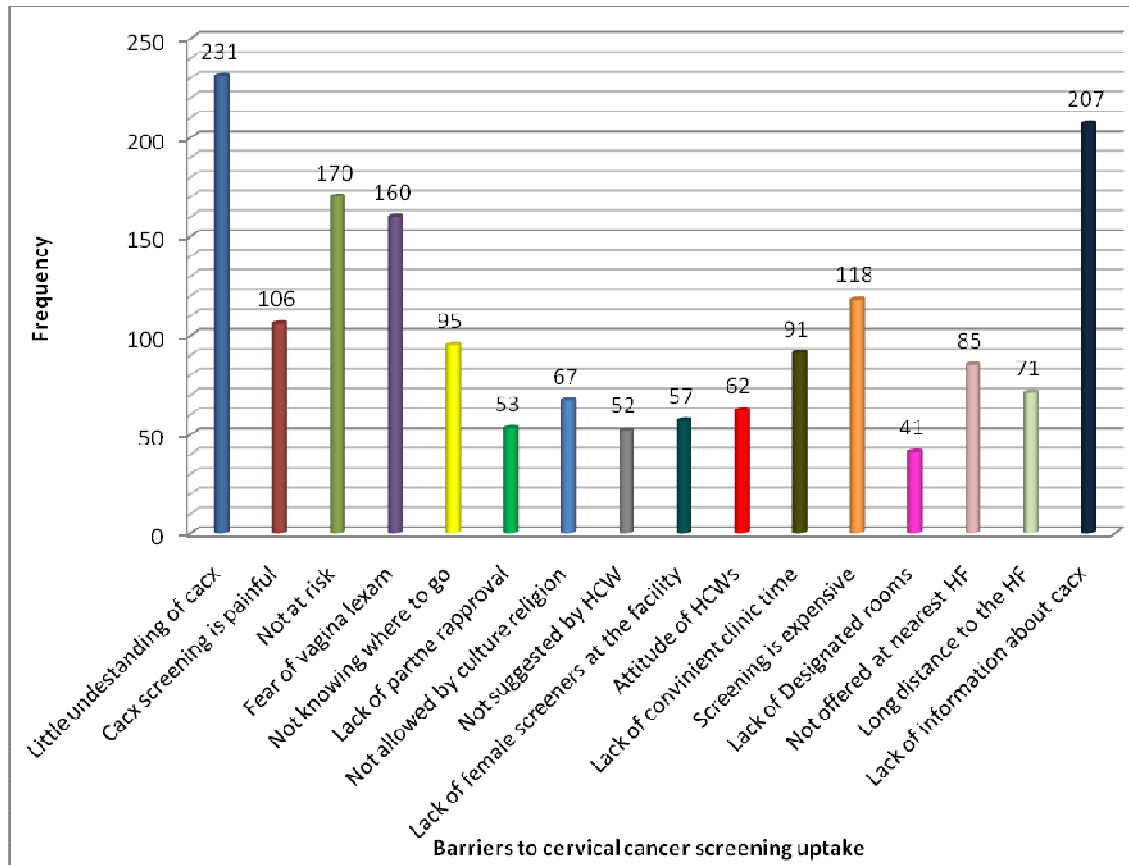
Figure10: Barriers to cervical cancer screening

Of all the responses, the most mentioned barriers to uptake of cervical cancer screening were little understanding of cervical cancer at 85.9% (n=231); lack of information about cervical cancer (77.0% (n=207)); the fact that they thought that they were not at risk (63.2% (n=170)) and fear of vaginal examination at 59.5% (n=160).

4.5.1: Preferred places for dissemination of information on cervical cancer
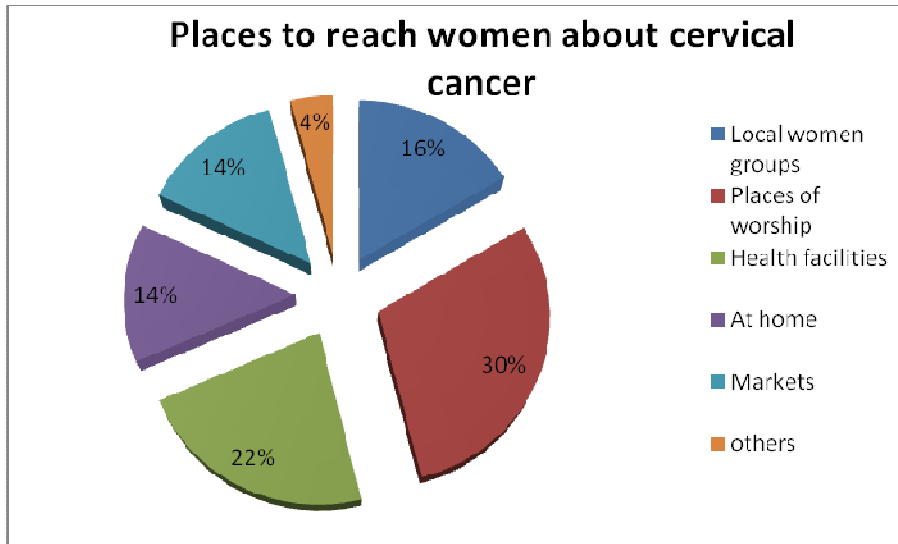
Figure 11: Preferred places to learn about cervical cancer

Thirty percent (n=173)) of the respondents reported that they would prefer to be learn about cervical cancer at the place of worship (church) especially after the church service. Others, 22% (n=130) preferred health facilities; 16% (n= 96) local women groups and an almost similar proportion 14% (n=81) preferred markets and at home (n=79). The other areas that would be convenient for them to learn about cervical cancer were schools and campaign/awareness meetings.

4.6: Bivariate analysis

Cross-tabulation was done to determine association between the uptake of cervical cancer screening and the predictor variables. Pearson's Chi-square statistics was used to determine the association. The predictor variables included socio-demographic characteristics, awareness of cervical cancer, knowledge of cervical signs and symptoms, ever heard of cervical cancer screening, knowledge of cervical cancer prevention and ability to identify cervical cancer symptoms.

4.6.1: Association between socio-demographic characteristics and uptake of cervical cancer screening

A statistically significant association was observed between employment status and uptake of cervical cancer screening; p= 0.05. There was no statistically significant association between socio-demographic characteristics of the respondents and uptake of cervical cancer screening.

Table 6 below summarizes the results.

Table 4: Association between demographic characteristics and cervical cancer screening uptake

Characteristics	Classification	Frequency	Percent	p-value
Age in years	<25	51	19.0	0.535
	25-34	102	37.9	
	35-44	64	23.8	
	45-54	33	12.3	
	55-64	12	4.5	
	>64	7	2.6	
	Total	269	100	
Marital Status	single (never married)	58	21.6	0.829
	Married	177	65.8	
	Separated	20	7.4	
	Divorced	1	0.4	
	Widowed	13	4.8	
	Total	269	100	
Education Level	Primary	123	45.7	0.247
	Secondary	104	38.7	
	Technical College	30	11.2	
	University	2	0.7	
	None	10	3.7	
	Total	269	100	
Religion	Catholic	64	23.8	0.610
	Protestant	202	75.1	
	Other	3	1.1	
	Total	269	100	
Employment status	Employed Fulltime	34	12.6	0.05
	Employed part time	7	2.6	
	Unemployed	46	17.1	
	Self-employed	163	60.6	
	Full time home maker(house wife)	15	5.6	
	Retired	3	1.1	
	Others	1	0.4	
	Total	269	100	
Monthly income	Less than 1000	82	30.7	0.389
	1000-5000	114	42.7	
	5000-10000	48	18	
	10000-20000	17	6.4	
	more than 20000	5	1.9	
	Total	269	100	

4.6.2: Association between cervical cancer awareness and screening uptake

Table 5: Association between cervical cancer awareness and screening uptake

Variables		Ever been screened		Total	P-Value
		Yes	No		
Ever heard of	Yes	66	155	**221**	
cervical cancer	No	0	48	**48**	
Total		**66**	**203**	**269**	**0.000**

There was a statistically significant association between respondent's awareness of cervical cancer and screening uptake; p=0.000

4.6.3: Association between awareness of cervical cancer screening and uptake

Table 6: Association between awareness of cervical cancer screening and uptake

Variables		Ever been screened		Total	P-value
		Yes	No		
Ever heard of	Yes	65	129	**194**	
cervical cancer	No	0	71	**71**	
screening					
Total		**65**	**200**	**265**	**0.000**

A statistically significant association was observed between awareness of cervical cancer screening and uptake of the same; p=0.000.

4.6.4: Association between knowledge of prevention of cervical cancer and screening uptake

Table 7: Association between knowledge of prevention of cervical cancer and screening uptake

Variables		Ever been screened		Total	P-value
		Yes	No		
Can cervical cancer be prevented	Yes	52	106	**158**	
	No	2	20	**22**	
	Don't know	12	77	**89**	
Total		**66**	**203**	**269**	**0.001**

Association between knowledge of prevention of cervical cancer and screening uptake by the respondents was found to be statistically significant; p=0.001.

CHAPTER 5: DISCUSSION

5.1: Cervical cancer screening uptake

Findings from this study indicate that, whereas 82.2 % of the women had heard about cervical cancer, and 73.2% had heard about cervical cancer screening, only 24.5% (n=65) of the respondents had ever been screened. Among those who had been screened, the majority were aged between 25-44 years. Other studies done among women reveal similar low uptake of screening among women. A study done in Kisumu county, Kenya whose objective was to assess the perceived risk of cervical cancer and risk factors influencing cervical cancer screening uptake, revealed that only 6% of the 388 women surveyed had been screened (Sudenga et al, 2013) In another cross-sectional study in Eldoret Kenya, whose objective was to find out the perceptions on cervical cancer risk, barriers to screening and previous screening status, only 12.3% of 219 participants had screened before(Were et al, 2011). Similarly, a Knowledge, Attitude and Practices (KAP) survey done in Kenyatta National Hospital revealed a past Pap smear screening rate of 22% (Gichangi et al, 2003).Another study performed in Voluntary Testing and Counseling (VCT) centers in Nairobi, Kenya (Rositch et al 2012)described an uptake rate of 14%. This therefore calls for a more organized multi stakeholder approach with the aim of increasing uptake of cervical cancer screening.

5.2: Socio- Demographic characteristics

Socio-demographic characteristics of the respondents have been found to affect uptake of cervical cancer screening among women. In this study, the mean age of the age of the respondents was 35 years with majority of the respondents 37.9% (n=102) aged between 25-34 years. There was no significant association between age and uptake of cervical cancer screening. However, screening was high among respondents aged 25-34 (36.4%) and 35-44 (34.8%).

This is in contrast with other studies that have found lower rates of screening among women aged 20-29 years (Liao et al 2006, Cyril et al 2009). Another study done in Kenya on risks and barriers to cervical cancer screening among 219 women attending MNCH-FP clinic at the Moi teaching and referral hospital (MTRH) found that women over 30 years were more likely to have screened for cervical cancer than younger women (Were et al., 2012).

Majority of the respondents, 66% (n=177) were married; about twenty two percent (22%) (n=58) single and the rest of the respondents 12.6% (34) were separated, widowed or divorced. Majority of those who had been screened 69.7% (n=46) were married but there was no significant association between marital status and uptake of screening. Other studies also found that unmarried and widowed women are less likely than married to obtain screening (Liao et al 2006). These findings are in contrast with other two studies that found that single women are more likely than married women to have been screened (Cyril CD et al 2009, Singh KK et al 1998).

Of all the women interviewed, 45.7% (n=123) had primary level education, 38.7% (n=104) had secondary level education, 11.9% had tertiary level education and 3.7% of the respondents had never been to school for any formal education. In this study, there was no significant association observed between level of education and cervical cancer screening.

This is in contrast with studies done by Liao et al 2006 and Fernandez et al 2009, who found that women with high screening rates have a higher level of education. The study done in Taiwan by Liao et al 2006 was among a randomly selected sample of women 20years and over and the interviews was done through telephone.

The employment status of the respondents was also established and 60% (n=163) of the respondents were self employed, 15.2% (n=41) were employed either full time or part-time, while 24.2% (n=65) were not employed. Most of the participants 42.7% (n=114) earned between 1000 and 5000 Kenya shillings per month, 30.7% (n=82) earned less than a 1000 and the remaining 26.6% earned between 5000 and 20,000 Kenya shillings. A statistically significant association was observed between employment status and uptake of cervical cancer screening. These findings are consistent with those in studies carried out in India (Nene et al, 2007) and at Kenyatta National Hospital (KNH), Kenya (Gichangi et al,2003) Increased socio-economic status place the women population in a better position economically increasing the likelihood of them seeking for cervical screening. This is because they are able to finance their health care needs.

5.3: Cervical cancer Awareness

5.3.1: Awareness of cervical cancer
This study determined the awareness of cervical cancer by respondents. Majority; 82.2% (n=221) had heard of cervical cancer. This level of awareness is in keeping with a study done in Kenya which found cervical cancer awareness to be 87.1 % (Ombech et al, 2012). The respondents in the Ombech et al study were primary school teachers and thus had tertiary level of education as compared to this study which was a household based study and had only 11.9% of the respondents with tertiary level of education. Other studies have found low levels of awareness among women on cervical cancer screening. A study done in Kenya looking at knowledge and practice of cervical cancer and cervical cancer screening among patients at Kenyatta National Hospital found that only 51% of the respondents knew about cervical cancer (Gichangi et al, 2003).

Another study among women seeking reproductive health services in Kisumu Kenya also revealed that only 29% of the respondents had heard about cervical cancer (Sudenga et al, 2013). The findings from this study indicated a significant association between respondent's awareness of cervical cancer and screening uptake.

5.3.2: Awareness of cervical cancer screening
Level of awareness of cervical cancer screening in this study was found to be 73%. The source of information on cervical cancer screening among most of the respondents was from a doctor (28% (n=65)). Other sources of information on cervical cancer screening were nurse (21.6% (n=50)); friends (17% (n=39)); community health workers (4.8% (n=11)) and family members (3% ((n=7)).Other respondents (25% (n=59)) reported their sources of information on cervical cancer screening to be awareness campaigns, church and school gatherings as well as media. On the contrary, a qualitative study in Nigeria found out that the respondents did not know what cervical cancer screening entailed nor did they know the screening methods though they still believed that it is important since like for other diseases it helped in early detection and treatment (Ndikom and Ofi, 2012).

Findings from my study indicated that women's knowledge and awareness of cervical cancer screening was significantly associated with uptake of screening or screening status. This means that women who are aware of cervical cancer and screening are more likely to undergo screening of the disease. In a qualitative study carried out in Malaysia, lack of knowledge on cervical cancer and the Pap smear test was found among the respondents. Many women did not have a clear understanding of the meaning of an abnormal cervical smear and the need for the early detection of cervical cancer.

Many believed the purpose of the Pap smear test is to detect existing cervical cancer, leading to the belief that Pap smear screening is not required because the respondents had no symptoms (Wong et al, 2009). The study in Malaysia was among a population of women who had never had a Pap smear.

5.4: Knowledge of signs and symptoms of cervical cancer

Knowledge of the signs and symptoms of cervical cancer was found to be poor. Only 34% (n=93) of the respondents identified postmenopausal bleeding as a symptom of cervical cancer. Only 31.6% (n=85) of the respondents identified bleeding between menstrual periods as a symptom of cervical cancer. A slightly higher proportion 32.7% (n=88) identified presence of vaginal discharge that is smelly as a sign of cervical cancer. In addition, only 25.7% (n=69) and 29% (n=78) identified pain during sex and bleeding during or after intercourse respectively as symptoms associated with cervical cancer. Similarly 26% (n=70) reported that having menstrual periods that are heavier than usual as symptoms of cervical cancer. This was in keeping with a study conducted among primary school teachers in Kenya. The study sought to find out to know if the women knew of the signs and symptoms of cervical cancer. The majority of the women were not aware of the common signs and symptoms of cervical cancer. Those who reported knowledge of the signs and symptoms were as follows: bleeding between periods/menses (31.6%), lower back pain (24.2%), smelly vaginal discharge (32.7%), pain and discomfort during sex (25.7%), heavy menstrual period (26%), vaginal bleeding after menopause (34.6%), and bleeding during or after sexual intercourse (29%) and unexplained weight loss (15.2%) (Ombech et al, 2012). Similar low levels of knowledge on cervical cancer signs and symptoms and its prevention have been reported in other studies.

A study in Tanzania reported that more than half of the respondents 59.6% of 354 women were not aware of cervical cancer signs and symptoms (Lyimo and Beran 2012). In Zimbabwe, a study among 356 women in Shurungwi and Mutoko districts found that 95.8% of the women had little knowledge about various aspects of cervical cancer including causes, prevention and treatment (Mangoma et al, 2007).

The low level of knowledge was also reflected in the respondents' confidence in identifying signs and symptoms of cervical cancer if they were affected by the disease. Only 4% (n=11) reported that they were very confident they would be able to recognize the signs and symptoms. Twenty eight percent (n=75) were fairly confident while 10% (n=26) and 58% (n=156) were not very confident and not confident at all respectively.

5.4.1: Knowledge of cervical cancer risk factors
The knowledge of cervical cancer risk factors was also found to be low. Only 23.5% (n=63) were aware that infection with Human Papillomavirus (HPV) is a risk factor for the development of cervical cancer. This is despite the fact that nearly all cases of cervical cancer can be attributed HPV infection and that cervical cancer is by far the most common HPV related disease (WHO, 2013). In a study done in Ghana looking at knowledge and beliefs on cervical cancer screening among 140 college students only 7.9% (n=11) identified HPV as a risk factor for development of cervical cancer (Abotchie & Shokar 2009). Tobacco and cigarette smoking has been listed as one of the risk factors for development of nearly all cancers including cervical cancer. In regards to this, only 32.4% (n=92) of the respondents identified cigarette smoking as a risk factor to the development of cervical cancer.

These findings compare to another study done in Estonia on women's knowledge about cervical cancer risk factors, screening and reasons for non participation in cervical cancer screening programmes. Of the 1054 women responded to the questionnaire, only 49.2% reported smoking as a risk factor (Kivistik et al, 2011). The study by Abotchie also found that only 1% (n=4) recognized smoking as a risk factor. It is important to note that the study by Abotchie was among college students. This means therefore as much as women are educated, it does not mean that they know the risk factors for cervical cancer.

Other risk factors identified by the respondents were; Immune-suppression of the immune systems due to infection with HIV and other conditions 28.1% (n=75); long-term use of the oral contraceptive pill 40% (n=109); presence or history of sexually transmitted infections 37.3% (n=100), having an uncircumcised partner 12.7% (n=34), early sexual debut 24.3% (n=65), and having many sexual partners 37% (n=101). Ten percent (10%) (n=27) identified having many children as a risk factor while 32.7% (n=88) and 35.3% (n=95) thought having a sex partner with many other sexual partners and lack of regular screening respectively could put woman at risk of developing cervical cancer.

Knowledge on prevention of cervical cancer was also sought and 58.7% (n=158) were aware that cervical cancer can be prevented, 8.2 percent (n=22) said that it cannot be prevented and 33.1% (n=89) did not know that cervical cancer is preventable. Early detection of pre-cancerous lesions is universally recognized as the most effective method of preventing cervical cancer. In this study, the respondents who reported routine screening as way of preventing cervical cancer were 31.6% (n=143). The rest of the modes of prevention identified included: following up on abnormal screening result 23.7% limiting the number of sexual partners 16.2% (n=73), not smoking 11.1% (n=50), vaccination with HPV vaccine 9.3% (n=42), and using condoms consistently and correctly during intercourse 8.2 %(n=37).

Knowledge of cervical cancer prevention was also found to be known by respondents in a study done in Kisumu, Kenya whereby 86% of the respondents believed that cervical cancer was curable if detected early and that screening should be conducted annually (Sudenga et al 2013).

There was a statistically significant association between respondent's knowledge of prevention of cervical cancer and screening uptake. In other words, when women are knowledgeable about the disease, its symptoms and how to prevent it, they are more likely to seek screening and also treatment from a health facility. In a study done in Kisumu among women seeking services at the Jaramogi Odinga Odinga hospital, knowledge level on the signs and symptoms of cervical cancer was an important determinant for being screened for cervical cancer (Morema et al, 2014). Of note is that the study in Kisumu was hospital based while my study was done among women in the households.

5.5: Barriers to cervical cancer screening
A Majority of all the women interviewed reported little understanding of cervical cancer (85.9%) and lack of information (77%) as barriers to cervical cancer screening respectively. Other barriers reported were, not thinking that one is at risk, fear of vaginal examination inconvenient clinic time, and others thought that the screening is expensive. Others reported that women were not using the services as they did not know where to obtain such services. These findings are supported by various studies. In a study in Nigeria, the major factors identified by the women that influence screening utilization were ignorance, illiteracy, belief that one is not at risk, having many contending issues, nonchalant attitude to their health, financial constraints and fear of having a positive result (Ndikom and Ofi, 2012).

In Brazil, a study on barriers to cervical cancer screening in women attending the Family Medical Program found that embarrassment was the greatest barrier to seeking professional services by women regardless of level of educational attainment. In this study other important barriers to seeking care and/or screening included time constraints, due to work or childcare (Augusto et al, 2013). Other studies have found that fear of abnormal results, illiteracy, lack of partner's approval, lack of finances (Lyimo & Beran; Were et al, 2011; Sudenga et al, 2013; Augusto et al, 2013).

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1: Conclusion

The study revealed that awareness of cervical cancer screening among the respondents was high but their knowledge of the signs and symptoms and risk factors associated with cervical cancer was low. This indicates that the women have a high level of the general knowledge about the disease but no knowledge of the disease itself or its progression.

Screening uptake was very low despite the high levels of awareness of cervical cancer and cervical cancer screening. This therefore indicates that there is disconnect between the respondents awareness and their health seeking behavior with regards to cervical cancer and screening.

A major barrier to screening was little or no understanding of the disease as well as lack of information about cervical cancer and screening itself. Many women also reported that they did not feel at risk and others were afraid of the vaginal exam during screening.

At the same time awareness of cervical cancer, awareness of cervical cancer screening and knowledge of modes of prevention of cervical cancer were found critical in determining cervical cancer screening uptake among the women.

6.2: Recommendations

- Awareness campaigns and education programmes to enlighten the public about cervical cancer screening should be broad to encompass signs and symptoms, risk factors and modes of prevention of the disease.

- Studies to explore the disparity between high awareness and low uptake should be conducted. For the disparity, a longitudinal cohort would be recommended to explore the factors better rather than a cross-sectional survey.

- Ministry of Health and the County Health teams should work with the schools, churches, institutions of higher learning and the community itself with the aim of increasing the uptake of screening.

- Explore new avenues of disseminating information like health talks to young women and men in schools and colleges; outreaches in market places and health briefs at the health facilities when the women are waiting to be seen by a doctor.

- Research is recommended that will look at the socio-cultural factors and service related factors affecting uptake of screening.

REFERENCES

1. Abdullahi A, Copping J, Kessel A, Luck M, Bonell C: Cervical screening: Perceptions and barriers to uptake among Somali women in Camden. *Public Health* 2009, 123:680-685

2. Abotchie PN, Shokar NK: Cervical cancer screening among college students in Ghana: knowledge and health beliefs. *International Journal of Gynecological Cancer* 2009, 19:412-416.

3. ACCP & World Health Organization. Cervical cancer prevention in developing countries: A review of screening and programmatic strategies, November 2003.

4. Amarin ZO, Badria LF, and Obeidat BR. Attitudes and beliefs about cervical smear testing in ever-married Jordanian women. *Eastern Mediterranean Health Journal.* 2008**;** 14**,** (2):389-397.

5. Ansink AC, Tolhurst R, Haque R, Saha S, Datta S. "Cervical cancer in Bangladesh: community perceptions of cervical cancer and cervical cancer screening." *Transactions of the Royal Society of Tropical Medicine and Hygiene* 102.5 (2008): 499-505.

6. Arrossi S, Paolino M, Sankaranarayanan R. Challenges faced by cervical cancer prevention programs in developing countries: a situational analysis of program organization in Argentina. Pan American Journal of Public Health. 2010 Oct; 28(4):249-57

7. Augusto EF, Rosa ML,Cavalcanti SM, Oliveira LH. Barriers to cervical cancer screening in women attending the Family Medical Program in Niterói, Rio de Janeiro. Arch Gynecol Obstet.2013 Jan; 287(1):53-8.

8. Ayayi IO and Adewole IF. Knowledge and attitude of general outpatient attendants in Nigeria to cervical cancer. *Central Africa Journal of Medicine*, 1998**;** 44**:**41–3.

9. Basu P, Chowdhury D. Cervical cancer screening &HPV vaccination: a comprehensive approach to cervical cancer control. Indian J Med Res,2009; 130: 241-246.

10. Bener A, Denic S, Alwash R: Screening for cervical cancer among Arab women. *International Journal of Gynecology & Obstetrics* 2001, 74:305-307.

11. Cancer incidence and mortality worldwide: Lyon, International Agency for Research on Cancer, 2011 (IARC Cancer Base No.10).

12. Chumnan K, Yupin P, Kriangsak J, Usanee S, Jatupol S: Knowledge, awareness and attitudes of female sex workers toward HPV infection, cervical cancer, and cervical smears in Thailand.*International Journal of Gynecology and Obstetrics* 2009, 107:216-219.

13. Cyril CD, Esther E, Madubuko T, Ngozi R, Ezegwui HU: Improved awareness of Pap smear may not affect its use in Nigeria: a case study of female medical practitioners in Enugu, southeastern Nigeria. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 2009, 103:852-854.

14. Denny L, Quinn M & Sankaranarayanan R (2006) Chapter 8: Screening for cervical cancer in developing countries. Vaccine 24 (Suppl 3), S71–S77.

15. Ezem, B. U. Awareness and uptake of cervical cancer screening in Owerri, South-Eastern Nigeria. *Annals of African Medicine*, 2007,*6*(3), 94.

16. Ferlay J, Shin H, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. International Journal of Cancer, 2010, 127:2893–2917.

17. Fernández JV, Rodrigues SH, Silva da Costa YG, Moura da Silva LC, Lima de Brito AM, Veríssimo de Azevedo JW, Duarte do Nascimento E, Medeiros de Azevedo PR, Thales AA:Knowledge, attitudes, and practices related to Pap test in Northeastern Brazil. *Rev Saúde Pública* 2009, 43(5):851-858.

18. Gichangi P, Estambale B, Bwayo J, Rogo K, Ojwang S, Opiyo A, Temmerman M: Knowledge and practice about cervical cancer and Pap smear testing among patients at Kenyatta National Hospital, Nairobi. *Kenya Int J Gynecol Cancer* 2003, **13**(6)**:**827-833.

19. Gillet E, Meys JFA, Verstraelen H, Verhelst R, De Sutter P, et al. (2012) Association between Bacterial Vaginosis and Cervical Intraepithelial Neoplasia: Systematic Review and Meta-Analysis. PLoS ONE, 2012 7(10): e45201. doi:10.1371/journal.pone.0045201

20. Grulich AE, van Leeuwen MT, Falster MO, Vajdic CM. Incidence of cancers in people with HIV/AIDS compared with immunosuppressed transplant recipients: a meta-analysis. *Lancet* 2007; 370(9581):59–67

21. Hummeida M, Elrasheed T, Burhan A: Cervical cancer prevention in Sudan. Barriers and missed opportunities. *Free communication (oral) presentations/International Journal of Gynecology & Obstetrics* 2009, 107(2):93-396.

22. Jo W, Bartosze M, Marlow L, Wardel J: *Barriers to cervical cancer screening attendance in England: a population-based survey Journal of Medical Screening.* 2009, 16:199-204.

23. Kenya cancer registry. (2006);Cancer incidence report, Nairobi, 2006

24. Kenya National Bureau of Statistics (KNBS) and ICF Macro (2010) Kenya Demographic survey 2008-09. Calverton, Maryland: KNBS and ICF Macro.

25. Kenya National Cancer Control strategy 2011-2016 (http://www.ipcrc.net/pdfs/Kenya-National-Cancer-Control-strategy.pdf)

26. Kidanto HL, Kilewo CD and Moshiro C. Cancer of the cervix: knowledge and attitudes of female patients admitted at Muhimbili National Hospital, Dar-es-Salaam. *East African medical journal*, 2002**;** 79(9):467 75.

27. Kivistik A, Lang Katrin, Baili Paolo, Anttila Ahti, Veerus Piret. Women's knowledge about cervical cancer risk factors, screening, and reasons for non- participation in cervical cancer screening programme in Estonia. BMC Women's Health 2011, 11:43 (http://www.biomedcentral.com/1472-6874/11/43)

28. Liao CC, Wang HY, Lin RS, Hsieh CY, Sunga FC: Addressing Taiwan's high incidence of cervical cancer: Factors associated with the Nation's low compliance with Papanicolaou screening in Taiwan.*Public Health* 2006, 120:1170-1176.

29. Louie KS, de Sanjose S, Mayaud P. Epidemiology and prevention of human papillomavirus and cervical cancer in sub-Saharan Africa. Trop Med & Int Health 2009; 14: 1287–1302.

30. Lyimo FS, Beran TN. Demographic, knowledge, attitudinal, and accessibility factors associated with uptake of cervical cancer screening among women in a rural district of Tanzania: three public policy implications. BMC Public Health 2012, 12: 22. doi: 10.1186/1471-2458-12-22

31. Mangoma JF, Chirenje MZ, Chimbari MJ, Chandiwana SK."Assessment of Rural Women's Knowledge, Constraints and Perceptions on Cervical Cancer Screening: The Case of Two Districts in Zimbabwe." *African journal of reproductive health* 10.1 2007: 91-103.

32. Morema EN, Atieli HE, Onyango RO, Omondi JH, Ouma C. Determinants of Cervical screening services uptake among 18–49 year old women seeking services at the Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu, Kenya. BMC Health Services Research *2014, 14:335*

33. Mugenda, O. M., & Mugenda, G. A. (2003). Research Methods: Quantitative and Qualitative Approaches. African Center for Technology Studies (ACTS)-Press, Nairobi Kenya.

34. Mutyaba, T., Faxelid, E., Mirembe, F., & Weiderpass, E. Influences on uptake of reproductive health services in Nsangi community of Uganda and their implications for cervical cancer screening. *Reproductive Health*, 2007, *4*(4), 1186.

35. National AIDS and STI Control Programme, Ministry of Public Health and Sanitation, Kenya. Guidelines for HIV Testing and Counseling in Kenya. Nairobi: NASCOP; 2008.

36. Ndikom and Ofi. Awareness, perception and factors affecting utilization of cervical cancer screening services among women in Ibadan, Nigeria: a qualitative study. Reproductive Health Journal, 2012, 9:11.

37. Nene B, Jayant K, Arrossi S, Shastri S, Budukh A, Hingmire S, Muwonge R, Malvi S, Dinshaw K, Sankaranarayanan R: Determinants of womens participation in cervical cancer screening trial, Maharashtra, India. *Bull World Health Organ* 2007, 85(4)**:**264-272.

38. Ngugi, C. W., Boga, H., Muigai, A. W., Wanzala, P., & Mbithi, J. N. Factors Affecting Uptake of Cervical Cancer Early Detection Measures Among Women in Thika, Kenya. *Health Care for Women International*, 2012, *33*(7), 595-613.

39. Ombech, E. A. & Mugai Anne W.T, Wanzala P. Awareness of cervical cancer risk factors and practice of Pap smear testing among female primary school teachers in Kasarani division , Nairobi Kenya. African Journal of Health Sciences 2012;21:121-132

40. Rositch AF, Gatuguta A, Choi RY, Guthrie BL, Mackelprang RD, Bosire R, Manyara L, Kiarie JN, Smith JS, Farquhar C: Knowledge and acceptability of pap smears, self-sampling and HPV vaccination among adult women in Kenya. *PLoS One* 2012, **7**(7)**:**e40766.

41. Singh KK, Bloom SS, Tsui AO: Husbands' reproductive health knowledge, attitudes, and behaviour in Uttar Pradesh, India. *Studies in Family Planning* 1998, 29:388-399.

42. Singh S, Badaya S. Factors Influencing uptake of Cervical Cancer Screening among Women in India: A Hospital based Pilot Study. J Community Med Health Educ 2012, 2:157. doi:10.4172/2161-0711.1000157

43. Sudenga SL, Rositch AF, Otieno WA, Smith JS. Knowledge, attitudes, practices, and perceived risk of cervical cancer among Kenyan women. International Journal of Gynecological Cancer.2013 Jun; 23(5):895-9.

44. Were, E., Nyaberi, Z., & Buziba, N. Perceptions of risk and barriers to cervical cancer screening at Moi Teaching and Referral Hospital (MTRH), Eldoret, Kenya. *African health sciences*,2011, *11*(1).

45. WHO Fact sheet N° 380 September 2013
46. WHO Fact sheet N°297 February 2006
47. WHO Fact sheet N°297 February 2011
48. WHO Press Release N°223, 12 December 2013
49. WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). Human Papillomavirus and Related cancers in Kenya - Summary Report - 2010).
50. Wong LP, Wong YL, Low WY, Khoo EM, Shuib R. Knowledge and awareness of cervical cancer and screening among Malaysian women who have never had a Pap smear: a qualitative study. Singapore Med J 2009, 50: 49–53. doi: 10.1080/10705500802365490

51. World Health Organization, Cervical cancer [http:/ / www.afro.who.int 2008.

APPENDICES

Appendix 1: Sampling Frame

EMBU COUNTY				
SUB COUNTY	**POPULATION**	**COUNTY ASSEMBLY WARD NAME(LOCATION)**	**COUNTY ASSEMBLY WARD POPULATION (APPROX)**	**COUNTY ASSEMBLY WARD DESCRIPTION(SUB LOCATIONS)**
MANYATTA	**154,632**			
		Ruguru-Ngandori	27,925	Kithunguriri; Kiriari; Kiamwinja; Mukuria; Kairuri; Mukangu; Manyatta; Kirigi; Rianjagi; Kamviu
		Kithimu	18,999	Ena West; Kithimu; Kithegi
		Nginda	28,511	Nguviu; Rugumu; Mbuvore; Gicherori; Kibugu; Ngerwe
		Mbeti North	33,468	Itabua; Gatituri; Kamiu; Kiangima
		Kirimari	32,185	Njukiri; Dallas; Nthambo; Kathangari; Kithungururu
		Gaturi South	13,544	Ena East; Nembure; Gatunduri
RUNYENJES	**142,360**			
		Gaturi North	24,398	Itoguri; Kavutiri; Kevote; Makengi; Kianjuki
		Kagaari South	20,426	Gichera; Nthagaiya; Kiringa; Kawanjara; Maranga
		Central	23,600	Gichiche; Kigaa; Gikuuri; Mbiruri; Gitare
		Kagaari North	24,952	Kianjokoma; Mbui-Njeru; Nduuri Kanja North; Kanja South; Mukuuri; Mugui; Kamugere
		Kyeni North	21,546	Mufu; Rukuriri; Njeruri; Kiangungi; Kathari; Iriari
		Kyeni South	27,438	Kathanjuri; Karurumo; Nyagari; Kigumo; Kathunguri; Kasafari; Mukuria; Kariru

Mbeere South	**130,185**			
		Mwea	30,117	Karaba; Wachoro; Riakanau; Gategi
		Makima	21,291	Makima; Mwea; Mbondoni; Mwea National reserve
		Mbeti south	29,579	Kiamuringa; Gachoka; Gachuriri; Mbita; Kirima
		Mavuria	34,139	Mavuria; Kombomunyiri; Kithunthiri; Gacegethiuri; Gichiche; Njigo; Nyangwa; Gikiiro
		Kiambere	15,059	Kiambere; Ntharawe; Kindaruma; Gacabari
Mbeere North	**89,035**			
		Nthawa	26,725	Siakago; Riandu; Gituburi; Thura
		Muminji	16,728	Gangara; Karambari; Mutitu; Nguthi; Kirie
		Evurore	45,582	Evurore; Kamarandi; Nthambu; Iriaitune; Ngura; Kathera; Kariri

Appendix 2: Consent

CONSENT EXPLANATION

Research Title: **Determinants of Cervical Cancer screening knowledge and uptake among women in Embu County, Kenya**

Principal Investigator: Anne Murugi Nthiga

Organization: University of Nairobi, School of Public Health.

Supervisors: Dr. Richard Ayah. Lecturer, School of public health
                   University of Nairobi

                   Prof. Joyce Olenja. Lecturer, School of public health
                   University of Nairobi

Introduction

I am Anne Murugi, a Masters student at the Nairobi University School of Public Health. I am doing a research on determinants of cervical cancer screening knowledge and uptake among women in Embu County. I am going to give you information related to the survey and invite you to be part of this research. You do not have to confirm your participation today whether or not you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research.

There are words that you may not understand. Please let me know by asking me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask me.

Purpose of the research

The purpose of this study is to determine the factors that influence knowledge and uptake of cervical cancer screening among women. The findings will be used by the policy makers to make decisions regarding cervical cancer prevention and treatment among women in Kenya.

Type of Research Intervention

This is a cross-sectional survey and will involve use of a questionnaire which will be administered by the investigator and the research assistants.

Participant selection

You were selected at random to participate in the study. Other participants were also selected randomly and they are women who reside in Embu County.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. You may change your mind later and stop participating even if you agreed earlier.

Confidentiality

We will protect information that you provide about you and your decision to take part in the research to the best of our ability. A code will be used on the questionnaire and your name will not appear anywhere in the reports. After data collection all questionnaires will be securely stored and access will be to the research team only.

Sharing the Results

The results of this research will be shared with you through feedback meetings before it is made available to other people. Confidential information will not be shared.

Possible Risk and Benefits

There are no known risks that you will be exposed to by participating in this study. There will be no direct benefits to the participants. However, the findings will be communicated to key stakeholders in the county to be able to make key decisions in regards to cervical cancer prevention and early detection.

Right to Withdraw

You do not have to take part in this research if you do not wish to do so. You may also stop the interview at any point if you so wish to. It is your choice and all of your rights will still be respected.

Who to contact

This research has been reviewed and approved by Kenyatta Hospital – University of Nairobi Ethics Review Committee (ERC), which is a committee mandated to make sure that research participants are protected from harm. In case of any questions you can contact them: P.O BOX 20723-002002, Nairobi. Tel: (020) 726300-9, Email uonknh_erc@uonbi.ac.ke.

You can ask me any more questions about any part of the research study, if you wish to or contact principal investigator Anne Murugi on mobile number: 0721922914. Do you have any questions?

INFORMED CONSENT FORM

I confirm that the information above was read and explained to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I hereby consent to participate as a participant in this research.

Name of Participant_____

Signature of Participant/Thumb print _____

Date _____

Day/month/year

Statement by the researcher

I confirm that the participant was given an opportunity to ask questions concerning the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of researcher----------------------------------   **Signature-------------------------**

Date --------/-------/-------Day/month/year

Appendix 3: Questionnaire

Questionnaire ID: _____   Date: ___/___/_____ Sub-Location:_____

A. DEMOGRAPHIC INFORMATION

1. **What is your age? _____**

2. **Date of birth_____**

3. **Parity (Number of previous deliveries)_____**

4. **What is your marital status?**

    a) Single (never married)

    b) Married (Living with partner)

    c) Married (separated)

    d) Divorced

    e) Widowed

5. **What is the highest level of education you have obtained?**

    a) Primary

    b) Secondary

    c) Technical college

    d) University

    e) Other (specify)

6. **What is your religion?**

    a) Catholic

    b) Muslim

    c) Protestant

    d) Other (specify)

7. **How long have you lived in this area?**

    a) Less than 3 months

    b) 3-6 months

    c) 6-9months

    d) 9-12months

    e) >1year

8. **Are you currently?**

    a) Employed full time

    b) Employed part-time

    c) Unemployed

    d) Self employed

    e) Full time home maker (house wife)

    f) Retired

    g) Others (specify)

9. **How much do you earn in a month?**

    a) Less than Ksh 1000

    b) Ksh1000-5000

    c) Ksh 5000-10,000

    d) Ksh 10,000-20000

    e) More than Ksh 20,000

10. **How many people do you currently reside with excluding yourself?**

    _____

B. CERVICAL CANCER AWARENESS/KNOWLEDGE

11. **Have you ever heard of cervical cancer?**

    a) Yes

    b) No

12. The following may be warning signs for cervical cancer. I am interested in your opinion

	Yes	No	Don't Know
a) Do you think vaginal bleeding between periods could be a sign of cervical cancer?			
b) Do you think persistent lower back pain could be a sign of cervical cancer?			
c) Do you think a persistent vaginal discharge that smells unpleasant could be a sign of cervical cancer?			
d) Do you think discomfort or pain during sex could be a sign of cervical cancer?			
e) Do you think menstrual periods that are heavier or longer than usual could be a sign of cervical cancer?			
f) Do you think persistent diarrhoea could be a sign of cervical cancer?			
g) Do you think vaginal bleeding after the menopause could be a sign of cervical cancer?			
h) Do you think vaginal bleeding during or after sex could be a sign of cervical cancer?			
i) Do you think blood in the stool or urine could be a sign of cervical cancer?			
j) Do you think unexplained weight loss could be a sign of cervical cancer?			

13. If you had a symptom that you thought might be a sign of cervical cancer, would you visit a health centre?

    a) Yes

    b) No

    c) Don't Know

14. The following may increase a woman's chance of developing cervical cancer. How much do you agree?

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
a) Infection with Human Papillomavirus (HPV)					
b) Smoking cigarettes					
c) Having a weakened immune system (e.g. Having HIV, Transplant)					
d) Long-term use of contraceptive pill					
e) Infection with sexually transmitted infections					
f) Having a sexual partner who is not circumcised					
g) Starting to have sex at young age (before 17years)					
h) Having many sexual partners					
i) Having many children (>5)					
j) Having a sexual partner with many previous sexual partners					
k) Not going for regular smears (Pap tests)					

15. How confident are you that you would notice a cervical cancer symptom?

    a) Not confident at all

    b) Not very confident

    c) Fairy confident

    d) Very confident

C. CERVICAL CANCER PREVENTION KNOWLEDGE AND SCREENING UPTAKE

16. Have you ever heard of cervical cancer screening? If yes go to 17, if no skip to 18.

    a) Yes

    b) No

17. If yes, how did you know about the screening? Tick all that apply

    a) Family members

b) Friends

c) Nurse

d) Doctor

e) Community health worker

f) Others (specify)…………………………………

18. Can cervical cancer be prevented? If yes go to question 19. If no skip to question 20.

a) Yes

b) No

c) Don't Know

19. Cervical cancer can be prevented through the following methods. Please tick all that apply

a) Vaccination with HPV vaccine

b) Routine Screening

c) Limiting the number of sexual partners

d) Not smoking and avoiding secondhand smoke.

e) using a condom if one is sexually active

f) Following up on abnormal screening results

20. Have you ever been screened for cervical cancer? if yes go to 21, if no skip to 22

a) Yes

b) No

21. If you answered yes to question 20, when was the last time screening was done?

a) Less than 1 month ago

b) 3 months ago

c) Six months ago

d) 1 year ago-

e) 3 years ago

f) Over 5 years ago

22. Below are some of the reasons women do not go for screening. Select all that apply?

a) Little understanding of cervical cancer

b) Cervical cancer screening is painful

c) Not thinking that one is at risk

d) Fear of a vaginal exam

e) Not knowing where to go for screening

f) Lack of husband/partner approval

g) Not allowed by religion/culture

h) Not suggested by the health care workers

i) Lack of female screeners at the health facility

j) Attitude of health care workers

k) Lack of convenient clinic time

l) The screening is expensive

m) Lack of designated rooms for screening at health facility (privacy)

n) Not offered at the nearest health facility

o) Long distances to a health facility

p) Lack of information about cervical cancer

23. **What would be the best place to reach women with cervical cancer screening messages? Tick all appropriate.**

a) Local women's groups

b) Places of worship (church/mosque)

c) Health facilities

d) At home

e) Markets

f) Others
(Specify)……………………………………………………………………

24. What is your opinion on the statements below

|	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
a) Good health practices can help prevent cancer.					
b) Cervical cancer develops slowly and is preventable.					
c) Screening can detect treatable, precancerous lesions before they progress to cancer.					
d) Women aged 30 and older are more likely to develop cervical cancer than younger women.					
e) Women in their 30s and 40s should be screened at least once.					
f) The screening procedure is relatively simple, quick, and is not painful.					
g) A screening test that is positive is not a death sentence!					

25. Is there any other information you would be willing to share about cervical cancer screening in your community?

_____
_____
_____
_____
_____
_____

END. Thank you for your time

Appendix 4: Schematic presentation of variables

Objective	Variables	Instrument	Questionnaire No.
To determine the socio-demographic factors associated with uptake of cervical cancer screening among women in Embu County	Age Marital status Level of education Employment status Monthly income Parity	Questionnaire	Qn. 1,2,3,4,5,,7,8,9,10
To determine the level of cervical cancer awareness among women in the community	Awareness of cervical cancer, awareness of cervical cancer screening, source of information on screening,	Questionnaire	Qn. 11, 16, 17
To assess knowledge of cervical cancer screening among women in Embu County	Knowledge of signs and symptoms of cervical cancer, ability to notice signs and symptoms, knowledge of prevention of cervical cancer, modes of prevention of cervical cancer	Questionnaire	Qn. 12, 13, 14, 15, 18,19
To determine the uptake of cervical cancer screening among women in Embu County	Ever been screened for cervical cancer, last time screening was done	Questionnaire	Qn. 20, 21
To determine barriers to cervical cancer screening uptake among women in Embu County	Reasons for not been screened; Little understanding of cervical cancer, lack of information, not feeling at risk, lack of convenient clinic time, fear of vaginal exams, not knowing where to go	Questionnaire	Qn. 22, 23

Appendix 5: KNH-ERC Approval Letter
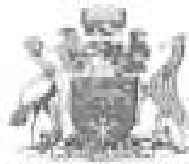
UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telephone: 2726300 Ext 44355

KNH/UON-ERC
Email: uonknh_erc@uonbi.ac.ke
Website: www.uonbi.ac.ke

KENYATTA NATIONAL HOSPITAL
P.O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/330

Link:www.uonbi.ac.ke/activities/KNHUoN

22nd October 2013

KENYATTA NATIONAL HOSPITAL
APPROVED
22 OCT 2013
ETHICS & RESEARCH COMMITTEE

Nthiga Anne Muraji
School of Public Health
College of Health Sciences
University of Nairobi
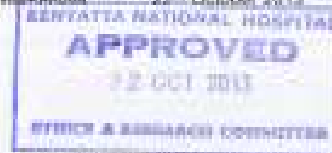
Dear Anne

RESEARCH PROPOSAL: DETERMINANTS OF CERVICAL CANCER SCREENING KNOWLEDGE AND UPTAKE AMONG WOMEN IN EMBU COUNTY, KENYA (P165/04/2013)

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above proposal. The approval periods are: 22nd October 2013 to 21st October 2014.

This approval is subject to compliance with the following requirements:

a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (Attach a comprehensive progress report to support the renewal).
f) Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
g) Submission of an executive summary report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website www.uonbi.ac.ke/activities/KNHUoN.

"Protect to Discover"

Yours sincerely

PROF. M. L. CHINDIA
SECRETARY, KNH/UON-ERC

c.c.   Prof. A.N.Guantai, Chairperson, KNH/UoN-ERC
The Deputy Director CS, KNH
The Principal, College of Health Sciences, UoN
The Director, School of Public Health, UoN
Assistant Director/Health Information, KNH
Supervisors: Prof. Olenja Joyce, Dr.Richard Ayah

"Protect to Discover"

Appendix 6: Declaration of Originality Form

UNIVERSITY OF NAIROBI
Declaration of Originality Form

Name of Student_____

Registration Number_____

College_____

Faculty/School/Institute_____

Department_____

Course Name_____

Title of work_____

_____

DECLARATION

1. I understand what Plagiarism is and I am aware of the University's policy in this regard

2. I declare that this _____ (Thesis, project, essay, assignment, paper, report, etc) is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other people's work or my own work has been used, this has properly been acknowledged and referenced in accordance with the University of Nairobi's requirements.

3. I have not sought or used the services of any professional agencies to produce this work.

4. I have not allowed, and shall not allow anyone to copy my work with the intention of passing it off as his/her own work.

5. I understand that any false claim in respect of this work shall result in disciplinary action, in accordance with University Plagiarism Policy.

Signature of student

_____

Date

_____

Signature of supervisor(s)

_____

Date

_____