FACTORS ASSOCIATED WITH UTILIZATION OF PAP TEST FOR CERVICAL CANCER SCREENING AMONG PREGNANT WOMEN IN EMBU COUNTY

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Factors Associated with Utilization of Pap test for Cervical Cancer Screening among Pregnant Women in Embu County

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DECLARATION

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

Signature…… Date…….....

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This thesis has been submitted for examination with our approval as University Supervisors.

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DEDICATION

I dedicate this thesis with much love and appreciation to my family and friends. I owe gratitude to God.

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ABBREVIATIONS AND ACRONYMS

AIDS: - Acquired Immunodeficiency Syndrome

AOR: - Adjusted Odds ratio

CDC: - Centre for Disease Control.

CI: - Confidence Interval

CIN: - Cervical intraepithelial neoplasia

DES: - Diethylstilbestrol

Df: - Degrees of freedom

DNA: - Deoxyribo-Nucleic Acids

EDDP: - Embu District Development Plan

FGD: - Focus Group Discussion

IARC: - International Agency for Research on Cancer

ICC: - Invasive Cervical Cancer

HIV: - Human Immunodeficiency Virus

HSIL: - High-grade squamous intraepithelial lesion

HPV: - Human Papilloma Virus

LSIL: - Low-grade squamous intraepithelial lesions

MOH: - Ministry of Health

NCCPPSP: - National Cervical Cancer Prevention Program Strategic Plan

OR: - Odds ratio

PAP: - Papanicolau

SD: - Standard deviation

WHO: - World Health Organization

WRA: - Women of Reproductive Age

OPERATIONAL DEFINITIONS

Awareness- For this study awareness meant "being familiar and knowledgeable about cervical cancer and cervical cancer risk factors." It also relates to the experience and perceptions influencing the uptake of cervical screening services.

Risk factors- These are factors that make a person to be susceptible to cervical cancer. Risk factors increase the odds of developing cervical cancer, and this factors include; HPV, smoking, Immunosuppression, poverty, etc.

Knowledge- For this study knowledge meant having facts, information and understanding of the term cervical cancer or cervical cancer screening (Pap test).

Perception- This is the ability to positively identifying self as at risk for developing cervical cancer.

Precancerous Cervical Lesion- This is an abnormality in the cells of your cervix that could eventually develop into cervical cancer.

Cervical screening- For the purpose of this cervical study, screening relates to early detection of pre-cancer lesions through a Papanicolaou smear (PAP).

A Papanicolaou test is a screening tool used to detect cervical abnormalities. Mucus and cells are collected from the ectocervix and endocervix, by scraping and then fixed onto a glass slide and sent to the Cytopathology Laboratory for Assessment (American Cancer Society, 2009:10).

Practice- This is the action taken by individual respondent to go for Pap test screening. For this study practice meant utilization or uptake of cervical cancer screening using Pap test.

ABSTRACT

Cervical cancer is the second most common cancer and the leading cause of cancer-related death among women in developing countries. In Kenya, women's knowledge of cervical cancer and Pap smears screening is very limited and this is a major challenge in efforts aimed at reducing the incidence, morbidity, and mortality associated with cervical cancer. Although the success of the Pap smear in the reduction of cervical cancer has been reported in several parts of the world especially in the developed countries, uptake of cervical cancer screening services have remained low among women in Kenya. The objective of this study was to determine the knowledge about Cervical Cancer, awareness of risk factors and utilization of cervical cancer screening among pregnant women attending ANC in Embu County. Also, the study determined the prevalence of precancerous cervical lesions among the women in the study group. A descriptive cross-sectional study that adopted a quantitative approach through interviewer-administered questionnaires and laboratory procedure using Pap smear test was used. The study population was pregnant women attending the antenatal clinic at Embu Level Five Hospital. Systematic random sampling was used to obtain the required sample size of 346 participants. Data analysis was conducted using SPSS and ACCESS programs. Of the 346 women interviewed only 30% (106) had ever had a Pap test done. Knowledge about cervical cancer was high 84% (292) among the women; however, the knowledge of Pap smear test and cervical cancer risk factors were low (42% and 23%) respectively. More than half of the women 58.7% (203) considered themselves at risk for cervical cancer and a majority showed a willingness to screen in the future 71.4% (247). There was a strong correlation between awareness of cervical cancer and practice of Pap smear test with 3.44 increasing odds. This association was statistically significant (P=0.001). This study also identified that there was a correlation between awareness of cervical cancer risk factors and practice of Pap test screening. The factors associated with uptake of the Pap test were age, the level of education, health insurance. Others included,

aware of HPV, Immunosuppression, smoking, STDs and Multiple sexual partners risk factors. Barriers identified for not screening included, not knowing about the test (41%), thinks it's too expensive (24%) and other didn't know where to go for the test (23%). A majority of the women obtained information about cervical cancer and Pap test from health care personnel 43.3% (125). Among the women, 6.0% (21) had precancerous cervical lesions. The women were advised to undertake a Colposcopy test. The uptake of Pap smear is abysmally poor according to the findings suggesting that majority of the women had never screened for cervical cancer among the target population. The result established a low correlation between the awareness of risk factors that cause cervical cancer and the practice of Pap smear screening. The implication of the results demonstrates the importance of instituting strategies that involves, aggressive awareness campaigns and education programs that focus on increasing women knowledge on risk factors, to inform them on the link between screening and early detection and the mode of prevention, and this will ensure a decline in incidence and mortality from cervical cancer.

CHAPTER ONE

INTRODUCTION

1.1 Background information

Cervical cancer forms in the tissues of the cervix (the organ connecting the uterus and vagina) also called the transformation zone. Cervical cancer, which is preventable and treatable, is caused by the sexually transmitted human papillomavirus (HPV). HPV is very common, and it is estimated that up to 80% of sexually active women would be infected with HPV at least once during their lifetime. This is usually between late teenage years and the early thirties. There are more than 100 strains of the virus, two of these strains 16 and 18 cause about 70 percent of cervical cancers worldwide (PATH, 2011).

Cervical cancer is usually slow-growing cancer that may not have symptoms but can be found with regular Pap test (a procedure in which cells are scraped from the cervix and examined under a microscope) (ICO, 2013). Cervical cancer is a malignant neoplasm of the cervix uteri or cervical area commonly detected in women in the 20s with a peak incidence of carcinoma in situ at 25-35 years. It may present with vaginal bleeding, but symptoms may be absent until the cancer is in its advanced stages**.** Primary preventive measures involves prioritizing HPV vaccination with Gardasil with treatment consisting of surgery (including local excision) in early stages, chemotherapy, and radiotherapy in advanced stages of the disease (ICO, 2013).

The major risk factor for cervical cancer is infection with human papillomavirus (HPV). The most common HPV types in patient were 16 and 18. A vast majority of women infected with HPV do not develop CIN or Cervical cancer. This suggests that infection with HPV alone is insufficient in development of cervical cancer and this underscores the importance of other co-factors. These factors include multiple sexual partners, early onset of sexual activity, history of STDs, smoking. Others were HIV/AIDs infection,

Immunosuppression multiparity and long-term use of oral and hormonal contraceptives (WHO, 2006).

Cervical cancer can be detected early and treated. The Papanicolaou test (also called Pap smear, Pap test, cervical smear or smear test) is a screening test used in gynecology to detect premalignant processes in the endocervical canal (Ombechi *et al*., 2012). Detected changes in the cervix can be treated, thus preventing cervical cancer. Pap smear test was invented by and named after prominent Greek doctor Georgiou ٠ s Papanicolaou. In developed countries, the widespread use of cervical screening programs has reduced the incidence of invasive cervical cancer by 50% or more (Smith *et al*., 2009)**.** A newly formed American Cancer Society endorsed the use of the vaginal smear as an effective cancer prevention test for carcinoma of the uterine cervix in the year 1945 (Kimani *et al*., 2012)**.**

Cancer of the cervix is the second most common cancer among women worldwide. It is an important global health problem, with an estimated 529,409 new cases occurring each year worldwide, with 274,883 of the women (52% of cases) dying (Kimani *et al*., 2012). Of the total new cases each year, about 86% occur in developing countries, with nearly 80% of the deaths occurring in developing countries. Worldwide, Eastern Africa is the region that is most affected by cervical cancer with age-standardized incidence rate and mortality rate of 25.3 and 34.5 per 100,000 women per year respectively (ICO 2013). Cervical cancer leads as the number one killer of women in the developing world and is also the second most common malignancy in women worldwide; this is after breast cancer (Kimani *et al*., 2012). This increased incidence of cervical cancer is attributed to unawareness of the disease and inadequacy of screening programs in developing countries. Cervical cancer is a critical reproductive health problem for women particularly in the developing countries where screening services are lacking or inaccessible for the majority (Ombech *et al*., 2012).

An estimated number of new cases that is 12.7 million of cervical cancer in 2012 (Farley *et al*., 2012) will rise to 21.4 million by the year 2030, with nearly two- thirds of this cancer diagnoses occurring in developing countries. This if the estimated change in population demographics in the next two decades remains unchanged (IARC, 2013).

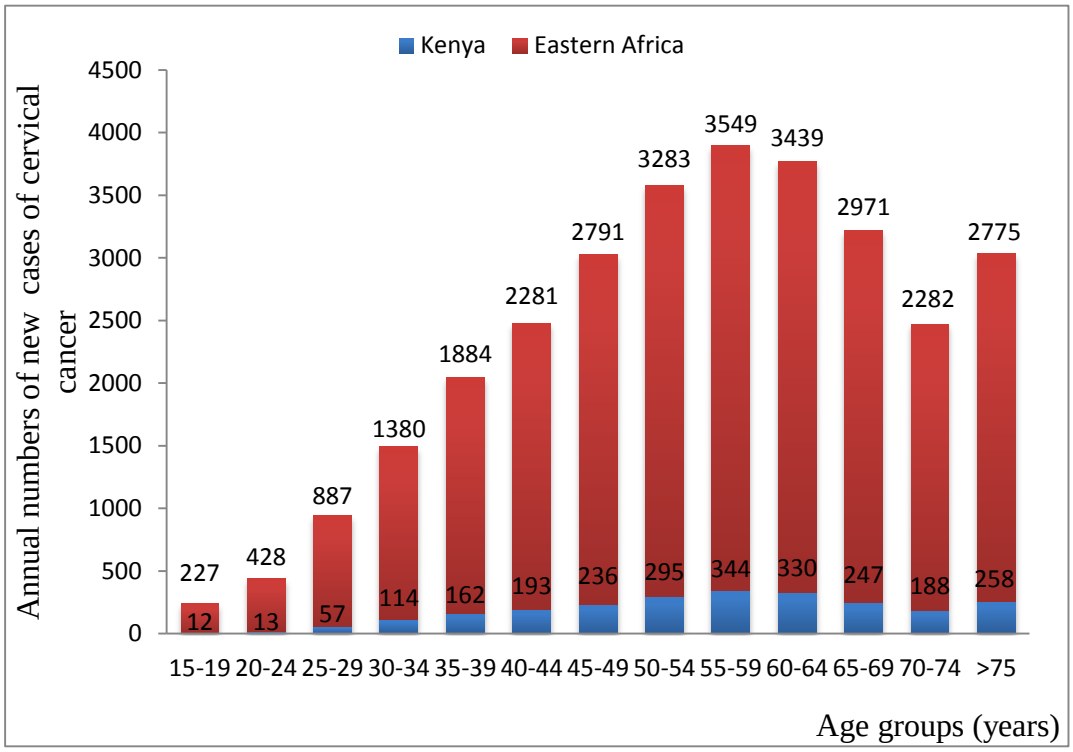

Figure1.1: Annual number of deaths from cervical cancer by age group in Kenya and Eastern Africa (estimations for 2012)

Data sources: Ferlay *et al*., 2013

An estimated population of 12.92 million women of ages 15 years and above in Kenya is at risk of developing cervical cancer (ICO 2015). Cervical cancer is the second most frequent cancer among women in Kenya and the leading cause of cancer deaths in women of reproductive age (WRA) (Kimani *et al*., 2012). 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 with projections that the number of new cervical cancer cases annually reaching 4802 (Kimani *et al*., 2012). In Kenya, cervical cancer accounts for 70 - 80% of all documented genital cancers (ICO HPV, 2015). Like most developing countries, Kenya lacks the financial and human resources to implement a nationwide cytology-based screening program (Gatune *et al*., 2005). A study carried out in Central Provincial General Hospital, Nyeri; Kenya findings were that utilization of cervical cancer screening services was low at 24.7% despite the fact that the study group consisted of well-educated women who had autonomy in decision making and proper family support. Among the participating women, only 20% of them knew the importance of cervical cancer screening while a majority (80%) of the women could just mention one to two risk factors for cervical cancer (Gichogo *et al*., 2012).

Cervical cancer screening methods available in Kenya, and which are part of the Ministry of Health's National Cervical Cancer Prevention Strategic Plan from 2012 to 2015, include the Papanicolaou (Pap) test, visual inspection with acetic acid, visual inspection with Lugol iodine and Colposcopy. However, the uptake of these methods remains very low in the country (Kimani *et al*., 2012). Papanikolaou and Traut first described the concept of cervical smears in 1941; and ever since the incidence and mortality of cervical cancer have markedly decreased in most developed countries, mainly due to effective screening programs' (Ombech *et al*., 2012). In most developing countries, knowledge of cervical cancer and Pap test among women is very shortcoming. A survey conducted in Embu, where women were randomly assessed and asked about knowledge of cervical cancer, it was identified that majority 77% had ever heard of cervical cancer; however the knowledge of cervical cancer screening and cervical cancer risk factors were low (41% and 22%) respectively despite high literacy rates among the women (Kibicho et al., 2014).

Cancer of the cervix is easily detectable and curable in its early stages. There is overwhelming evidence that cervical cancer today is almost entirely preventable to a large extent through screening and treatment of premalignant lesions (ICO, 2010), the service is unfortunately not

readily available to the general population in most developing countries, including Kenya. It is unfortunate that 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 a marked reduction in incidence and prevalence of cervical cancer (Kimani *et al*., 2012). In Kenya, it was estimated that only 3.2% of women in Kenya aged 18-69 years had been screened (Kimani *et al*., 2012). Sudenga, Rositch, Otieno, and Smith concur with the situation in Kenya that women in developing countries don't undertake screening services. They identified that few women (6%) had been screened for cervical cancer according to a recent study conducted among Kenyan women to determine knowledge, attitudes, practices, and perceived risk of cervical cancer (Sudenga *et al*., 2013).

Knowledge about the disease and risk factors are therefore important in determining appropriate health-seeking behaviours with the aim to prevent invasive cancer and reduce mortality rates. This research study will provide insight into the knowledge level and experiences of semi-rural women to screening and cancer, and also explore the factors influencing access to screening services.

1.2 Statement of the problem

Cervical cancer is a preventable disease, yet it is the leading cause of cancer-related morbidity and mortality among women in Kenya with 4802 cases and 2451 deaths occurring annually (ICO, 2013). If there is no intervention carried out, cervical cancer cases and deaths are expected to rise by 55% and 36% respectively by the year 2025 (ICO, 2013). The screening coverage of urban women is higher than that of rural women 4% vs. 2.6% (ICO, 2013). This is attributed to the fact that rural women are more impoverished and less educated hence are likely to lack the financial means to seek screening services and to be unaware of cervical cancer and method of preventing it (Mutuma, 2006). In Kenya, women's knowledge of cervical cancer and Pap smears screening is very limited, and this is a major challenge in efforts aimed at reducing the incidence, morbidity, and mortality associated with cervical cancer (Gatune *et al*, 2005). A majority of women of reproductive age (WRA) including pregnant women are at risk

of acquiring cervical cancer if they are not screened early. Pregnant women are exposed to a majority of the risk factors for cervical cancer; therefore, it's essential for them to have Pap tests to detect cervical cancer early. Concentration on the prevention and control of communicable diseases has resulted in bias in addressing Pap smear testing and risk factors associated with cervical cancer. Social – economic characteristics including poverty and low health literacy have been observed to increase the risk of developing cervical cancer in women as is the situation in Embu County. Women of reproductive age seeking services in Embu Hospital are increasingly being diagnosed with cervical cancer in its late stages. Deaths due to cervical cancer in Embu Hospital were as follows; 2012- 28, 2011- 26, 2010-21, 2009- 15 fatalities (Embu PGH records). The low health literacy in the county adversely impacts cervical cancer incidence, mortality, and quality of life. The vast majority of women in the county may have limited knowledge of risk factors for cervical cancer thus negative influence in the utilization of cervical cancer screening services.

1.3 Justification of the Study

Cervical cancer is an important public health concern in Kenya. It is the second most common cancer in women but the most common cause of cancer deaths (ICO 2015), yet little attention has been set in addressing public awareness on risk factors and uptake of Pap smear testing. The overall cervical cancer screening coverage is unacceptably low in Kenya. It is estimated that only 3.2% of women aged 18-69 years are screened every three years. Information concerning knowledge on risk factors for cervical cancer and the practice of utilization of Pap smear testing in areas of low social – economic status and low health literacy will be relevant in policy decision in the allocation of medical care resources. Women attendance rate for the antenatal clinic is high 89% (EDDP) within the Embu County and this period can be used to inform women on the awareness of cervical cancer prevention and risk factors. Knowledge about the disease and risk factors will therefore be crucial in determining appropriate health-seeking behaviours with the aim to prevent invasive cancer and reduce mortality rates. The main study

assumption was that people's knowledge about cervical cancer and the risk factors directly influence their health-seeking behaviour towards prevention or treatment of the disease. The study will help in sensitizing the policymakers and recommend public education as the first step in ensuring knowledge of cervical cancer existence, risk factors and methods of prevention and this will help see declining death rates from cervical cancer during the next decade among women of reproductive age in Embu County. Therefore, the Ministry of Health will benefit by using the policy that will be implemented as a result of the findings to improve medical care to cancer patients hence consumer benefits.

1.4 Research Questions

1. What is the knowledge and perceptions about cervical cancer and Pap test screening among pregnant women in Embu County?
2. What is the level of awareness of risk factors for cervical cancer among pregnant women in Embu County?
3. What are the social-economic / cultural factors associated with the uptake of Pap test screening among pregnant women in Embu County?
4. What is the proportion of precancerous cervical lesions among pregnant women in Embu County?

1.5 Objectives

1.5.1 General Objective

To determine factors associated with the practice of Pap test screening and determine the proportion of pregnant women in Embu County with precancerous cervical lesions.

1.5.2 Specific Objectives

1. To determine knowledge and perceptions about cervical cancer and Pap test screening among pregnant women in Embu County.
2. To determine the awareness of risk factors for cervical cancer among pregnant women in Embu County.
3. To determine social-economic / cultural factors associated with uptake of Pap test screening among pregnant women in Embu County.
4. To determine the proportion of pregnant women in Embu County with precancerous cervical lesions.

1.6 Variables

1.6.1 Dependent Variable

1. The uptake of Pap test screening.
2. Abnormal cervical cancer lesions

1.6.2 Independent Variable

1. Knowledge of cervical cancer risk factors.
2. The awareness about cervical cancer and Pap smear test.
3. Sociodemographic characteristics.
4. Economic background.
5. Cultural beliefs

1.7 Limitations and assumption of the study

The main study assumption was that people's knowledge about cervical cancer and the risk factors directly influences their health seeking behaviour towards prevention or treatment of the disease. The findings had limited generalizability as the study was restricted to only women who attended antenatal care at Embu Level Five Hospital. Due

to resources and time that was available, not a large sample was involved in the study as would be desired. Also, most women were not ready to undertake the Pap test and this resulted in reduced participants in the Pap smears screening among the women and this was a limitation of the study. It was assumed that the participants answered the questions in the questionnaire truthfully and honestly to the best of their knowledge. It was also assumed that the sample selected represented the view of the larger population.

CHAPTER TWO

LITERATURE REVIEW

2.1 Epidemiology

Cancer is a class of diseases in which a group of cells displays uncontrolled growth, with an intrusion on and destruction of adjacent tissues hence may spread to other locations in the body via blood or lymph. Cancer may be the result of DNA (Deoxyribo-Nucleic Acids) mutations; (gene defects) that activate cells promoting cell division (oncogenes). This may be a result of inactivation of tumour suppressor genes, causing abnormal proliferation of cervical cells. Cervical cancer is a result of abnormal cell changes in the tissue layers of the cervix (figure 2.1). It appears as a cauliflower-like growth that bleeds easily on contact (Smertzer *et al*., 2004)**.**

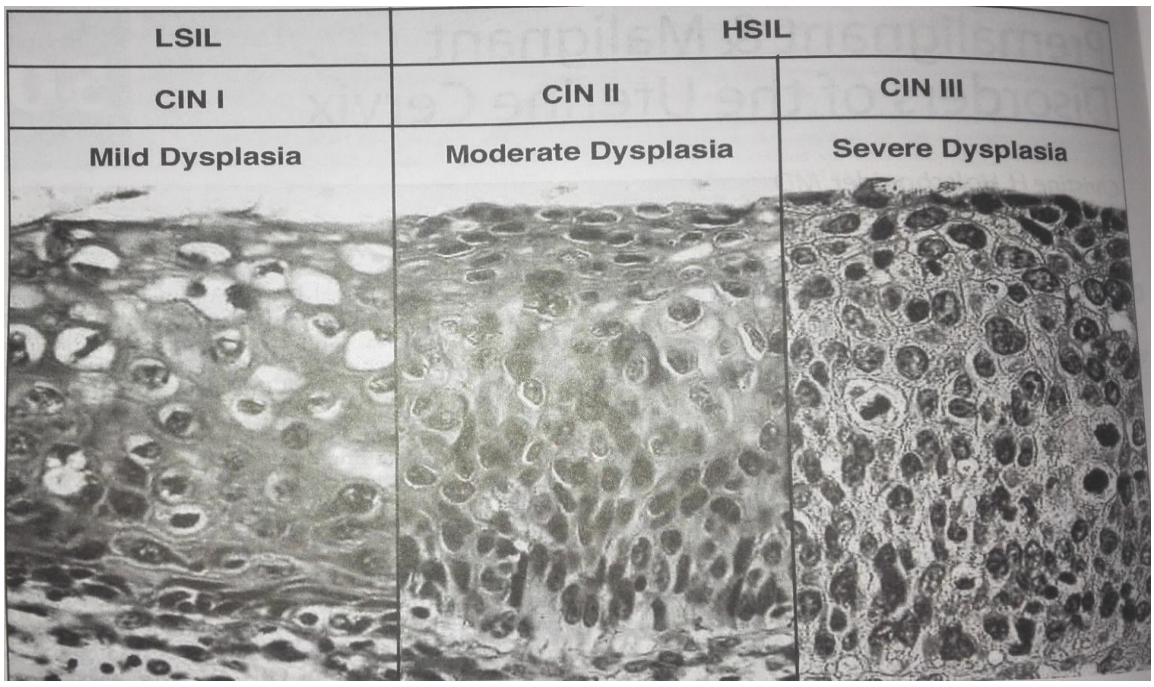

Figure 2.1: Changes in the terminology for cervical intraepithelial neoplasia

Cervical cancer is a virus-induced disease that is caused by persistent or chronic infection with one or more of the high-risk (cancer-causing or oncogenic) types of human papillomavirus (HPV) (Butel, 2000). After entering cervical epithelial cells, high-risk HPV infection interferes with their normal functions, leading to changes characteristic of pre-cancer (also called dysplasia). The conditions (co-factors) that may lead HPV infection to persist and progress to cancer are not well understood, but the following risk factors probably play a role: HPV type, immune status, co-infection with other sexually transmitted agents, tobacco smoking and parity (number of babies born) and young age at first birth. However; most women infected with high-risk HPV do not develop cancer because most infections, regardless of HPV type, are short-lived; the body eliminates them spontaneously in less than two years (Strugnell *et al.,* 2011). Infection with high-risk HPV only persists (becomes chronic) in a small percentage of women, and only a small percentage of these chronic infections can progress to pre-cancer; of these, even fewer will progress to invasive cancer (Berman, 2011).

Seven out of 10 (70%) of all cervical cancer cases reported throughout the world are caused by only two types of HPV: 16 and 18. Another four high-risk HPV types – 31, 33, 45 and 58 – are less commonly found to be associated with cervical cancer, with particular types being more prevalent than others in certain geographical areas. Two low-risk types of HPV (6 and 11) do not cause cervical cancer but are the cause of most genital warts or condylomas (Khan *et al*., (2005).

Invasive squamous cell carcinoma of the cervix is the end stage of a process beginning with the atypical transformation of cervical epithelium at the squamocolumnar junction, leading to cervical intraepithelial neoplasm (CIN) of advancing grades and eventual invasive disease. Factors associated with atypical transformation largely relate to sexual practices that increase the opportunity for human Papillomavirus (HPV) infection (Hawes *et al*., 2002). Early age at first intercourse may be important because adolescence is a period of heightened squamous metaplasia, and intercourse at this time may increase the likelihood of atypical transformation. Women with multiple sexual

partners increase the likelihood of exposure to HPV. Prevalence is highest among women ages 20 to 24 at 45% (WHO, 2007).

Smoking also has been associated with increased risk for cervical cancer, even after adjustment for a number of confounding factor. This association has biologic credibility because potentially mutagenic substances are secreted in the cervical mucus of smokers (Jonathan et al., 2010). Other factors that relate to disease progression include oral contraceptive use and diet. Long-term use of oral contraceptive has been reported to increase the risk of high-grade intraepithelial lesions and invasive cervical cancer. Finally, the progression of CIN is likely to be greater in immunosuppressed women, such as those with human immunodeficiency virus infection (Jonathan et al., 2010).

Cervical cancer starts in the cells on the surface of the cervix, involving columnar or squamous cells. The cells most affected are squamous cells. Progression of pre-cancer lesions (dysplasia) is usually slow, and detection of early pre-cancer lesions can easily be achieved through Pap smear testing and is 100% treatable (WHO, 2007). Pap smear is taken from the squamo-columnar junction of the cervix also known as transformation zone where abnormal changes occur. If undetected, pre-cancer lesions can develop into cervical cancer and eventually infect organs such as the uterus and ovaries, bladder, intestines, and liver.

The recent development of HPV vaccines that is, Gardasil and Cervarix offers an approach to true primary prevention of cervical cancer worldwide. Unfortunately, vaccination does not accelerate clearance of prevalent HPV infections, which means that the vaccine is not effective for women who have already been affected (WHO 2015). Screening for cervical cancer is important so as to ensure early detection of pre-cancer lesions to reduce the incidence of deaths due to cervical cancer in the population (Adanu *et al*., 2002). Screening with Papanicolaou (Pap) smear continues to be an important cervical cancer preventive strategy. Population studies have demonstrated a correction between cytological screening and declining mortality from cervical cancer (Khan *et al*.,

2005). Case-control studies demonstrate that women who have had Pap smears at least every three years have one-tenth the risk of developing invasive disease compared with women who have never had a Pap test (Jonathan et al., 2010).

2.2 Cervical Cancer Prevalence and Burden

Cervical cancer is the second leading cause of cancer in females in developing countries and first in developed countries. The global prevalence of cervical cancer is estimated to be 2.3 million and the incidence to be 529,409 with 274,883 of the women (52% of cases) dying with nearly 80% of the deaths occurring in developing countries (ICO, 2103). WHO further projects that deaths from cervical cancer will rise to 320,000 in 2015 and 435,000 in 2030. The Human Papilloma Virus (HPV) contributes to over 70% of all cervical cancer cases, of which 41-67% is high-grade lesions, and 16-32% are low-grade cervical lesions. Cervical cancer screening is important to diagnose pre-cancer lesions early. The crude incidence rate and standardized incidence ratio are estimated to be 16 and 100 per 100000 women respectively. The mortality rate of cervical cancer is estimated to be 8.9 per 100000 females globally and the cumulative risk of being 0.7%.The risk of cervical cancer tends to increase with age, reaching the peak point in 35 per 100000 women from 55-64 years age groups **(**WHO/ICO, 2007) as is the situation in Kenya.

2.3 Prevalence and Burden of Disease in Kenya

Cervical cancer is the fourth most common cancer in women worldwide, and the seventh overall, with an estimated 528,000 new cases in 2012 and more than 85% of the cases in developing countries (Ferlay *et al*., 2013). Kenya has a population of 12.92 million women aged between 15 years and above who are at risk of developing cervical cancer (ICO, 2015). Cervical cancer ranks as the 1st most common female cancer in women aged 15 to 44 years in Kenya with about 4,802 new cervical cancer cases diagnosed annually (estimations for 2012) (Bruni *et al.,* 2015). Cervical cancer is largely a preventable disease using vaccines for preventive care and early screen for proper

management. However the cervical cancer screening coverage in Kenya for all women 18 to 69 years of age is only 3.2% (MOMS & MOPHS, 2012). In contrast to the developed nations, 80% of cases are very advanced at presentation thus prognosis is usually poor (Matheka *et al.,* 2013). Two types of Human Papillomavirus (HPV)-vaccines are approved and allowed for use in Kenya. However, HPV vaccination is not part of the national immunization scheme and the cost implication makes the uptake of the vaccine to be low (ICH, 2013). In addition, these vaccines don't protect against all HPV types that can cause cervical cancer, neither do they treat pre-existing HPV infection nor HPV-associated disease (WHO, 2014).This low coverage for the screening of cervical cancer is attributed to the vast majority of women in the country having limited knowledge on risk factors for cervical cancer thus negative influence in the utilization of cervical cancer screening services (Ombech *et al*., 2012).

2.4 Knowledge, Awareness, and Experiences Regarding Cervical Cancer and Pap test screening

Various studies have been conducted globally to evaluate women's awareness of cervical cancer and screening practices. In a qualitative study carried out in West Virginia to assess awareness and knowledge of cervical and breast cancer among women, it was found that women were more knowledgeable about breast cancer than cervical cancer. Some of the common misconceptions were on the frequent use of tampons during menstruation as the cause of the disease. Some also believed that women who had a hysterectomy performed, regardless of the indication, do not require cervical screening in the future (Lyttle *et al*., 2006). These misconceptions could negatively impact on the future uptake of cervical screening services. Barriers to screening were mostly cost-related as women in developed countries are expected to pay so as to access such services. The other barriers were fear of the unknown, embarrassment, denial, lack of time and lack of transportation. Paucity of motivational factors was cited, and therefore there is a need for further interventions such as increased educational campaigns by health care professionals, the buddy system where the relative

or friend could accompany each other to the health care service and motivation by health care providers to encourage women to go for testing. Women also advised that educational campaigns should be varied, that is television programs, the radio, mail and contact sessions be utilized and they also emphasized the importance of varying educational techniques by various educators to cater for different age groups (Lyttle *et al*., 2006).In a quantitative study conducted to assess knowledge and acceptability of Pap smears self-sampling and HPV vaccination among adult women in Kenya, findings were that majority of women knew that Pap smears are used to detect cervical cancer (69%). Very few knew that routine Pap screening is the main way to prevent cervical cancer (18%). Most women did not know the cause of cervical cancer (78%) and only 18% had ever heard of HPV. Previous Pap smear screening was low in the cohort, with most women (86%) never reporting having had a Pap smear before joining the study. The findings highlights the need to educate and reinforce to women that routine Pap smear screening is a crucial part of preventing invasive cervical cancer so that the fear of being diagnosed with cancer is not a barrier to screening (Rositch *et al*., 2012).

Most studies conducted globally have indicated the lack of knowledge and awareness of women regarding cervical smear testing and cervical cancer. This has resulted in a low uptake of screening services. In a qualitative study conducted among women aged between 21 and 56, most women had inadequate knowledge of cervical cancer (Wong *et al*., 2009). Most of them had heard of cervical cancer previously but were not aware that it could be prevented. Only a few older, married women were aware that if cervical cancer is detected early, it could be managed. The role of the Pap smear in early detection was also poorly understood. Only less than half of women recognized the risk factors. Most surprisingly, most of these women thought the Pap smear is performed to diagnose sexually transmitted infections, and the procedure itself was not well understood (Wong *et al*., 2009). These findings indicate that a lot needs to be done to increase public awareness, knowledge, and insight of women regarding the importance of early screening for cervical cancer. Educational messages should reach all women regardless of educational level, race or socio-economic status. Most of the women who

participated in the above study had secondary education. This shows that the educational level would not contribute much to the assimilation of health education messages.

In a study conducted at Moi Teaching and Referral Hospital (MTRH), Eldoret, Kenya which assessed perceptions of risk and barriers to cervical cancer screening, found a low level of self-reported previous cervical cancer screening even among this very highly selected population, consisting women already seeking reproductive health services. Only 12.3% of the participants reported having screened at least once before the study. The participants reported critical barriers to access as including fear of positive screening (or abnormal Pap smear) results, lack of knowledge about the screening services and lack of finances to buy the services. Lack of awareness and low priority accorded women's health have been cited as some of the factors contributing to the observed reluctance of women to access screening services (Were *et al*., 2011).

In a study conducted in Nigeria amongst professionals, other public servants and students, the level of awareness of cervical screening were average (52.8%). However, only 7.1% had ever done a Pap smear test. The most common reasons given for not doing a Pap smear test included the lack of awareness (46%), fear of a bad result and some felt there was no need for it (Ezem *et al*., 2007). One would expect the level of awareness to be higher in this sample. However, this result attests to findings from other countries. Women do not access screening services despite knowledge about such services. In most cases, the proportion of women who had ever had a Pap smear is far less than half of the women who reported an awareness of the Pap smear. Almost half of the women in a study conducted in Ghana reported doing a Pap smear because the doctor asked for it as part of patient management. Results also showed that although 93% of women have heard of cervical cancer, only 37% of those had adequate knowledge about this disease. Of those with adequate knowledge, only 8.5% had a Papanicolaou (Pap) smear done (Adanu *et al*., 2002). A study that sought to assess knowledge and practice about cervical cancer and Pap smear testing among patients at Kenyatta National Hospital; Nairobi Kenya identified that about half of the participants

(51%) were aware of cervical cancer. However, only 6% had a Pap smear test done. Previous Pap smear testing was significantly more likely if the patient had cervical cancer (AOR 1.5) or was aware of cervical cancer (AOR 2.1). Patients with some education (AOR1.9) or those who had used family planning (AOR 2.4) and condoms (AOR 1.9) were also significantly more likely to have had a Pap smear in the past. However, the perception of risk of cervical cancer was not associated with the history of previous Pap smear testing (OR 1.3, P=0.334) (Gichangi *et al*., 2003).

A study conducted to assess knowledge, attitude, practices, and perceived risk of cervical cancer among women in Kisumu, Kenya also revealed a lack of awareness about cervical cancer and Pap smears. Whereas 91% of the surveyed women had heard of cancer, only 29% of the 388 surveyed women had previously heard of cervical cancer. Most had received their information from health care workers. Few women (6%) had ever been screened for cervical cancer and cited barriers such as fear, time, and lack of knowledge about cervical cancer (Sudenga *et al*., 2013). This was considerably lower than other previous studies in sub-Saharan Africa (12%Y27%), yet consistent with the Kenyan Ministry of Health's estimate of 3.2% for women 18 to 69 years old (Kimani *et al*., 2012). The study found that women who have a perceived risk of cervical cancer were significantly more likely to accept cervical cancer screening in the future compared to women who did perceive themselves at risk. Other studies also found similar results that perceived a low risk of cervical cancer to be associated with a low uptake of screening (Ndlovu *et al*., 2011).

Women in developing countries like Kenya seem to utilize reproductive health services more during pregnancy. They also use reproductive health services for a postnatal check-up and family planning or when faced with various gynecological problems. It is important to ensure that these women are screened in order to reduce the incidence of cervical cancer. Their visit to the clinics provides an opportunity to give them information on the importance of the screening and where to get the services. A study to explore the factors influencing utilization of cervical screening services among women

in selected Health facilities in Ibadan, Oyo State observed that many women attending various health facilities have not been screened. The study concluded that there is an urgent need for more enlightenment about cervical cancer, especially by health workers. Also, cervical cancer services should be made available at very affordable cost so that women can easily access the services to reduce the incidence of invasive cancer (Chizoma *et al*., 2012).

2.5 Cervical Cancer Screening In Kenya

According to the World Health Organization (WHO), any successful cervical cancer screening and treatment programs must have a high coverage of the at-risk population (WHO, 2006)**.** Cervical cancer accounted for 20% of all cancers among women based on 2002 data from the Nairobi Cancer Registry (Mutuma, 2006). The percentage may be higher since population-based data are not available for all of Kenya.

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). However, access to screening services is still limited and only about 3% of women in Kenya between 18 and 69 years have been screened for cervical cancer. According to a recent study conducted among Kenyan women to determine knowledge, attitudes, practices, and perceived risk of cervical cancer identified that few women (6%) had been screened for cervical cancer (Sedunga *et al*., 2013).This suggests that understanding factors associated with women's perceived risk of cervical cancer could guide future educational and clinical interventions to increase cervical cancer screening.

In many developing countries, women knowledge of cervical cancer is very limited. Many studies have shown that cervical cancer and Pap testing awareness positively influences the utilization of cervical cancer screening services (Idestrom *et al*., 2002). A study conducted in Embu County on determinants of cervical cancer screening uptake among women reported little understanding of cervical cancer and lack of information as

barriers to cervical cancer screening respectively although 25% of the women had ever been screened for cervical cancer (Nthiga *et al*., 2014). A study was done in Thika among 498 women suggested that factors affecting uptake of cervical cancer include, lack of awareness of cervical cancer and the benefits of early detections measures. In this study, only about 17.3% of the women had ever gone for cervical cancer screening (Ngugi *et al*., 2012).

Papanicolaou (Pap) test, visual inspection with acetic acid, visual inspection with Lugol iodine and Colposcopy are cervical cancer screening methods available in Kenya. Cytology screening has been effective in reducing the incidence of and mortality from cervical cancer in developed countries, particularly in organized programmes. The major advantages of cytology screening are the considerable experience accumulated worldwide in its use, and that it is so far the only established screening test for cervical cancer precursors that has been shown to reduce the incidence and mortality of the disease. However, cytology has limitations; the test is embarrassing and is difficult to comprehend in many cultures, and it is impossible to abolish the disease with screening (WHO, 2006)**.**

As part of the Ministry of Health's National Cervical Cancer Prevention Strategic Plan from 2012 to 2015, uptake of these screening methods remained very low in the country (Rositch *et al*., 2012). The aim 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 risks factors associated with cancer, investment in cancer control workforce, equipment and through cancer research. Several factors may contribute to the underutilization of screening, including lack of awareness, lack of funds, women's worry about examination discomfort, fear of finding cancer, and inability to establish effective follow-up treatment (Were *et al*., 2011)**.**

The burden of disease due to cervical cancer is high and also poses a challenge to the overburdened healthcare systems in Kenya (Mulemi, 2010). Knowledge of the disease is

essential as a health promotion strategy, and this formed the basis for the questionnaires and the research design that was utilized in this study. Few studies have been conducted in Embu County to determine awareness of cervical cancer risk factors and practice of Pap test; hence, the study will provide a basis for exploration of key issues through a qualitative approach in the future.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Design

A cross-sectional descriptive study that adopted a quantitative approach through interviewer-administered questionnaires to determine awareness of cervical cancer risks factors and practice of Pap test screening and laboratory procedure to determine the proportion of abnormal cervical cancer lesions among pregnant women in Embu County. The study was carried out over a period of five months (from February 2015 to June 2015) following approval from the ethics committee and County health department.

This aimed at quantifying the distribution of individual variables in the study population at one point in time or over a period of time that would help to determine awareness of cervical cancer risks factors and practice of Pap test screening among pregnant women in Embu County.

3.2 Study Site

The study was conducted in Embu Level 5 Hospital located in Embu County. It is a relatively large teaching hospital in the outskirts of Embu town. It is the main hospital in Embu County, providing both inpatient and outpatient services for a large population. Embu County comprises a population of 516,212. The population of women aged 15-49 is estimated to be 108,436. According to Embu District Development Plan (Kenya National Bureau of Statistics, 2008), the County is characterized by a rural settlement pattern with only two major urban centers namely Embu and Runyenjes. With the introduction of free maternal care in the public hospital, it is expected that majority of pregnant women within the county will seek care at the Embu General Referral Hospital. The antenatal period presents important opportunities for reaching pregnant women with

interventions aimed at sensitizing awareness of cervical cancer and risk factors, and this will help see declining death rates from cervical cancer.

3.3 Study Population

The study targeted all pregnant women over 18 years attending antenatal care within Embu Level 5 Hospital who had lived in Embu County. The point of recruitment of the study population was within the health facility. The facility has a high women attendance rate for the antenatal care 89% (EDDP) and routine cervical cytology at the first prenatal visit is essential to pregnant women.

3.3.1 Inclusion Criteria

Pregnant women above 18 years old living in Embu County for more than three months

Pregnant women attending antenatal care in Embu general referral hospital

Pregnant women above 18 years who willingly consented to participate in the study

3.3.2 Exclusion Criteria

Women who were selected but did not sign the consnt form were being excluded.

Women who had a history of the disease (cervical cancer)/ cervical incompetence

3.4 Sample Size Determination

The sample size was calculated using the formula (Cochran, 1977) for the exact probability test. It was a statistical significance test used to analyse categorical data to determine the significance of association between knowledge and uptake. The sample used for the study was calculated at 95% confidence interval.

$$n=\frac{Z^2Pq}{d^2}$$

Where: n = Sample size

Z = 1.96 (confidence interval at 95%)

P = Variance of population- Prevalence of cervical cancer screening being 29% according to Kibicho J. 2014.

q = (0.71) 1-P

d = Acceptable margin of error of (0.05)

n = 315

This sample size was adjusted for refusal at the rate of 10% bringing the sample population to **346**.

3.5 Sampling Procedure

A list of all pregnant women was obtained from the MCH/FP clinic. Systematic random sampling was then done, whereby the names of the pregnant women attending the hospital was listed and numbered. This was done first by calculating the sampling interval (k) for women participants attending antenatal clinic. The skip interval was calculated as: ***K = N/n =***

(Total population/sample size).

Total population of women attending antenatal clinic was estimated to be 1000 and calculated sample size was 346.

Therefore, ***K= N/n*= 1000/346 = 2.89**, hence random start was established where every 3rd pregnant woman was recruited.

The first participant was randomly sampled and thereafter every third pregnant woman was approached; the next one was approached if the previous one decline to participate in the study. This was repeated until the required sample size of 346 was obtained. The selected participants were requested to participate in the study, and upon giving written informed consent.

3.5.1 Quality Assurance

Participants were explained of the procedure to be performed carefully and were reassured with utmost confidentiality. All the Pap smear slides were clearly labeled with the medical record number to identify the participant. A completed requisition form with the participant's clinical history accompanied each specimen. Pap smear was obtained from each participating woman performed by opening the vaginal canal with a speculum, then collecting cells from the outer opening of the cervix and the endocervix using an endocervical brush and the sample smeared directly onto a microscope slide. Taking of Pap smear was done by a qualified doctor/cytologist to ensure high reproducibility of results. Sample slides were fixed immediately with ethanol for 30 minutes before transportation to the laboratory with a slide holder. The samples were then stained using the Papanicolaou staining technique and sent to cytologist to detect potentially precancerous changes.

3.5.2 Ethical Considerations

Ethical approval to carry out the study was obtained from the Scientific Steering Committee (SSC) and Ethical Review Committee (ERC) committees of Kenyatta National Hospital. Only those participants who gave their personal and written consent were allowed to participate in the study. All the information obtained was strictly used for purposes of the research and was held as confidential. Relevant permission was sought from the relevant hospital authorities and the local County administration before carrying out the research.

Data collection emphasized on issues of confidentiality and privacy by restricting access to the information collected and coding of questionnaires. This was done by administering the questionnaire in private with the respondent. The informed consent document was read to the participants informing them of what the study entails. After voluntary and informed consent had been explained, only the women, who meet study requirements, verbally consented and voluntarily signed the consent forms were enrolled into the study.

Documentation of consent was by signing the informed consent document. Each study subjects were informed of their right to decline or withdraw any time from participating in the study without feeling constrained. Participants were informed that the information will not be made available to persons outside the study team. Participants were further assured that no person-identifiers would be used for publication. All information about the participants would be handled with utmost confidentiality and only used for intended purposes.

Apart from the inconveniences caused by taking part of the participants' time, the procedure was safe, and there are no risks involved. Some questions in the questionnaire would appear uncomfortable, but it was necessary for the participants to answer them with honesty. There was no further anticipated potential risks or harm.

3.6 Data Collection

3.6.1. Interviewer-administered questionnaires.

Data was collected using an interviewer-administered semi-structured questionnaire. The questionnaire was divided into three sections, namely section 1: Socio-demographics, section 2: knowledge/awareness, section 3: perceptions and experiences. The questionnaire contained questions on sociodemographic characteristics, individual level, and health seeking characteristics which included; knowledge about cervical cancer, Pap smear testing, previous screening history, and knowledge of the risk factors associated

with cervical cancer. Others were a personal perception of risk of developing cervical cancer, willingness to screen for cervical cancer in the future and the source of information about the Pap test.

The interviewer then read out questions systematically to ensure the woman answered all questions as required. I did quality control of completed questionnaires. I also checked questionnaires for completeness, consistency and legibility and where necessary meetings were held with the interviewers to clarify inconsistencies.

3.6.2 Clinical and Laboratory Procedure

After the interviewer had administered the questionnaire, the participants were requested to undertake a Pap test. Sample collection was within the facility. Participants not ready at the time were requested to come at a specific period of their convenience. Fare was reimbursed for those participants.

Pap smear was obtained from each participating woman performed by opening the vagina canal with a speculum, then collecting cells from the outer opening of the cervix of the uterus and the endocervix (transformation zone) and the sample smeared directly onto a microscope slide. Sample slides were fixed with ethanol (95% alcohol) for 30 minutes before transportation to the laboratory. I performed the Papanicolaou staining technique on the samples slides following a Standard operating procedure and sent to a cytologist to detect potentially precancerous changes.

3.6.3 Principle of Papanicolaou stain

Papanicolaou stain includes both acidic and basic dyes. Acidic dye stains the basic components of the cell and basic dye stain the acidic components of the cell. The polychromatic PAP stain involves five dyes in three solutions.

Hematoxylin: Natural dye hematoxylin is the nuclear stain which stains cell nuclei blue. It has affinity for chromatin, attaching to sulphate groups on the D.N.A. molecule.

Harris' hematoxylin is the commonest cytologically although Gills' hematoxylin and Hematoxylin S can be used.

Orange Green 6: This is the first acidic counter stain (cytoplasmic stain) which stains matured and keratinized cells. The target structures are stained orange in different intensities.

Eosin Azure: This is the second counter stain which is a polychrome mixture of eosin Y and light green SF

Eosin Y gives a pink colour to cytoplasm of mature squamous cells, nucleoli, cilia and red blood cells. Staining solutions commonly used in cytology are EA 31 and EA 50, while EA 65

Light green SF stains blue to cytoplasm of metabolically active cells like parabasal squamous cells, intermediate squamous cells and columnar cells.

3.7 Data Management

After the interview had been done, there was systematic organization of raw data. Collected data from the study was thoroughly checked and validated for accuracy and completeness. Pre- coding was done in some cases. Coding of the questionnaire and cleaned data was filed a waiting for data entry.

3.7.1 Data Storage

Data on the questionnaire was electronically stored. Data was saved on the computer and backup devices for example, flash discs, DVDs, and compact disk which were password protected and accessible only to the research personnel. Sharing of the data was only made when necessary between the Principal Investigator and the Supervisors.

Pap sample slides were well labeled and stored in slide carriers for transport safely to the cytologist for observation. Sample slides were handled with utmost confidentiality and only used for intended purposes.

3.7.2 Data Analysis

Data was entered in Ms. Access and data cleaning using EPI – Info. Data was analyzed using statistical packages for social sciences (SPSS) version 20. Descriptive statistics was used to analyze quantitative data to determine frequencies and proportions that influence level of awareness and uptake of Pap screening test. The results would be interpreted and presented in frequency distribution tables, percentages, graphs and summary statistics. Assessment of awareness of risk factors for cervical cancer was determined by a mean percentage of 50% and above. Bivariate analysis with 95% confidence interval (CI) was calculated to establish the relationship between awareness of cervical cancer risk factor and practice of Pap testing and used the Chi-Square test ($\chi 2$) and *t*-test to analyze data. Mantel – Haenzel method was used to test for confounding and effect modification for all risk factors. Multivariate analysis used multinomial logistical regression to analyze dependent variable against several sociodemographic variables and the awareness of cervical cancer risks factors independent variables. Test of significance was based on 95% confidence interval, and a *P* value of 0.05 was considered significant.

3.8 Expected Application Of Results.

The study determined the extent to which awareness of cervical cancer risk factors and utilization of Pap test was among women in Embu County. Thus, the findings of the study are expected to help in decision making on how to improve uptake of cervical cancer screening services in Embu County. The results of the study should contribute to the development of programs informing women of reproductive age on the importance and benefits of cervical examination done via screening tests. The study results will assist in the development of programs designed to dispelling any myths or factors present among women that hinder them from undergoing the cervical cancer screening tests. Findings from this study will inform the National Cervical Cancer Prevention Strategic Plan (2012 -2015) aimed at reducing the incidence, prevalence, morbidity and

mortality from cervical cancer and the improve quality of life of cervical cancer patients to achieve these goals. Therefore, the Ministry of Health will benefit by using the policy that will be implemented as a result of the findings to improve medical care for cancer patients hence consumer benefits.

The results obtained were published in a peer-reviewed journal where a wide audience can access them. The results were also used in writing my thesis as part of requirements for the University for the Award of a degree and results were disseminated to the participants through workshops.

CHAPTER FOUR

RESULTS

4.1 Response rate

The study targeted sample size of 346 respondents from which all questionnaires were filled making a response rate of 100%. The response rate for Pap test screening was excellent as 91.9% (318) of the participants screened for cervical cancer.

4.2 Socio-demographic and Social-economic characteristics of the study participants

This study enrolled pregnant women from age 18 and above who had attended ANC. A total of 43% (149) of the women were in age groups 18-29 years, 43.3% (150) were aged between 30–39 years while those in the age groups 40 years and above were 13.6% (47).

Most of the participants 38% had secondary school education, 30% had a college education, 22% had primary education, and 7% were university graduates. 3% had no formal education.

The employment status of the participants was also established and 15.9% (55) of the participants were housewife's and 6.9% (24) others category. 43% (149) were employed either full-time or part-time while 34.1% (118) were not employed.

A majority of the women (55% of the participants) earned less than 5,000 shillings per month. These were the majority of participants earning between 5001 and 10000 consisting of 17.9% (63), 12.9% (44) earned between 10001 and 20001 while 8.2% (28) earned 20000 and above.

A total of 92% (320) of the participants were Christians while 8% (26) consisting of Muslims.

A total of 69% (238) of women were married, 26% (89) were single, 4% (14) were divorced while five participants reported as cohabiting.

The majority of the participants (60.7%) resided in rural while 39.3% of the participants resided in urban areas.

A majority of the participants, 54 % (184 participants) lacked insurance cover. However, 46% of the participants had insurance cover.

A majority of the women (88.2%) had been pregnant before. Only 44 participants (11.8%) did not have a history of pregnancy.

A majority of the women 85.0% who participated in the study had between 1-3 children, 14.4% of the participants had between 4-5 children. Only two women had above five children. The mean age of the first child was 24yrs with a standard deviation of 4.785.

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

Table 4.1: Socio-demographic and economic characteristics (N=346)

Variables	Classifications	Frequency	%
Age(yrs)	18 – 29	149	43.1
	30 – 39	150	43.3
	>40	47	13.6
Education level	No formal education	10	2.9
	Primary	75	21.7
	Secondary	132	38.1
	College	104	30.1
	University	25	7.2
Religion	Christian	320	92.5
	Muslim	26	7.5
	Others	0	0
Marital status	Married	238	68.8
	Single	89	25.7
	Divorced/ Separated	14	4.0
	Cohabitating	5	1.5
	Widowed	0	0
Residency	Rural area	210	60.7
	Urban area	136	39.3
Employment status	Employed full time	80	23.1
	Employed part time	69	20
	Unemployed	118	34.1
	Other	24	6.9
	Housewife	55	15.9
Monthly income	No income	18	5.2
	Less or equal to 5000 shillings	190	55
	5,001-10,000	63	18.2
	10,001-20,000	45	13
	20,001-30,000	30	8.6
Health insurance	Yes	159	46
	No	187	54
Pregnant before	Yes	305	88.2
	No	41	11.8
Parity	1-3	259	85.0
	4-5	44	14.4
	Above 5	2	0.6

4.3 Prevalence of precancerous cervical lesions.

The overall prevalence of precancerous cervical lesions among the pregnant women who participated in Pap test screening was 6.0% (21). Results showed both atypical squamous cells of undetermined significance (ASC-US), 19 women and Low grade – squamous intraepithelial lesions (LSIL), 2 women. The women were advised to undertake Colposcopy as a determinant for cervical cancer.

Table 4.2: Result of the cytology (Pap smear) test of the participants

Cytology results		Frequency	%
Negative		297	94
Positive	Stage		
	ASC-US	19	5.4
	LSIL	2	0.6
INVASIVE CARCINOMA		0	0

When segmented into age groups, women aged 40-49 had increased abnormal cervical lesions accounting for 38.1% followed by age group 30-39 having 33.3% of the women figure 4.1 below.

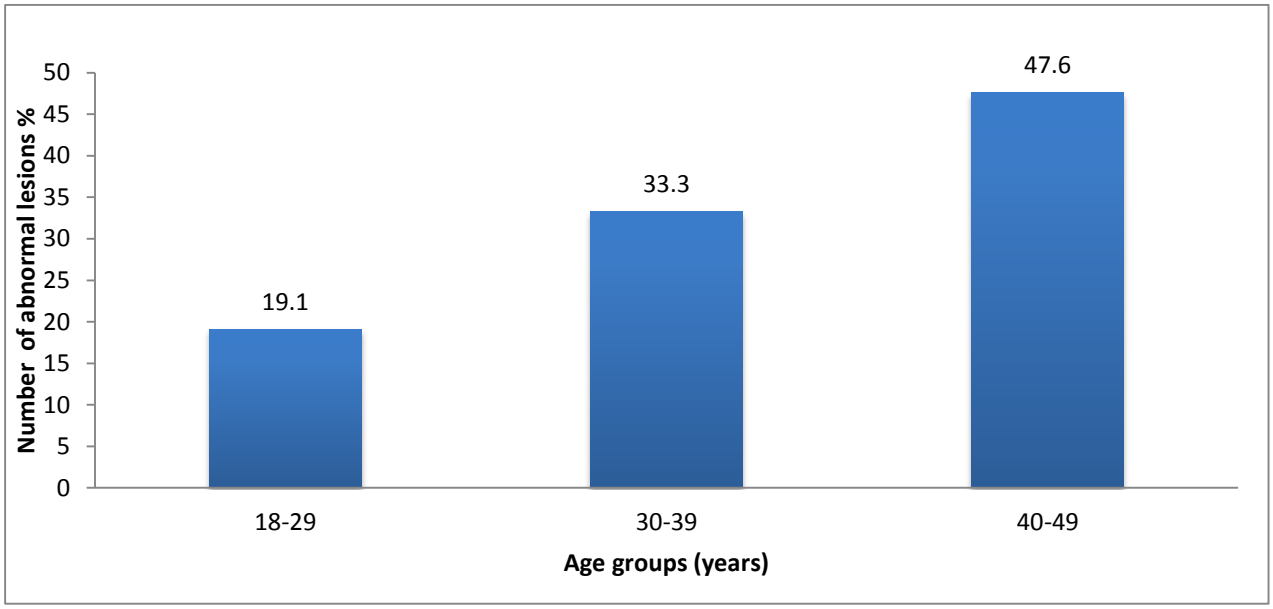

Figure 4.1: Prevalence of precancerous cervical lesions by age groups

4.4 Knowledge of cervical cancer and Pap smear test

The study findings indicate that majority of the participants 84.4% (292) were aware of cervical cancer, while 15.6% (54) of the participants were not aware of cervical cancer. When asked about a cervical cancer screening test only 42.8% (148) of the participants knew a Pap smear screening test. A proportion of the participants mentioned blood as a screening test 22.8% (79) for cervical cancer, 4.9% (17) mentioned urine test while the rest 29.5% indicated not knowing any screening tests.

When asked if cervical cancer can be prevented, most of the participants 43.1% (149) knew that cervical cancer can be prevented. About 30.9% (107) indicated that cervical cancer cannot be prevented while other participants 26.0% (90) did not know that cervical cancer can be prevented.

Table 4.3: Knowledge of cervical cancer and Pap smear test

Variables	**N=346**	**%**
Ever heard of cervical cancer		
Yes	292	84.4
No	54	15.6
Basic test conducted to screen for cervical cancer		
Blood test	79	22.8
Urine test	17	4.9
Pap smear test	148	42.8
Do not know	102	29.5
Can cervical cancer be prevented		
Yes	149	43.1
No	107	30.9
Don’t know	90	26.0

4.5 Knowledge of risk factors associated with cervical cancer

Most women 47.7% (165) identified inheritance as a risk factor that could lead to the development of cervical cancer, 40.2% (139) of them identified having STDs as a risk factor to cervical cancer, 39.3% (136) identified multiple sexual partners as a risk factor, 34.4% (119) identified smoking as a risk factor for cervical cancer while only 29.8% (103) participants identified HPV as a risk factor. Other risk factors that were identified by the participants included: use of hormonal contraceptives 12.1% (42) and oral contraceptives 10.4% (36), Immunosuppression 26% (90), early sexual debut 28% (97) and early pregnancy 13% (44). In addition 12.4% (43), 7.8% (27) and 5.5% (19) of the participants thought that old age, diet, and poverty respectively could put one at risk of developing the disease. These findings indicate that most 76.6% (265) of the respondent were not aware of the most common risk factors for cervical cancer. The mean percentage was 23.4% for women who were knowledgeable about risk factors associated with cervical cancer.

Table 4.4: Knowledge on risk factors associated with cervical cancer (N=346)

	TRUE (yes)	%	FALSE (no)	%	DON'T KNOW	%
Multiple sexual partners	136	39.3	47	13.6	163	47.1
Use of oral contraceptives	36	10.4	191	55.2	123	35.6
Use of hormonal contraceptives	42	12.1	122	35.3	182	52.6
STDS	139	40.2	46	13.3	161	46.5
Inherited	165	47.7	83	24	98	28.3
Human Papillomavirus	103	29.8	60	17.3	183	52.9
Immunosuppressant	90	26	72	20.8	184	53.2
Smoking	119	34.4	57	16.5	170	49.1
Early sexual debut	97	28	44	12.7	205	59.3
Early pregnancy	44	12.7	96	27.8	206	59.5
Old age	43	12.4	210	62.5	93	25.1
Diet	27	7.8	171	49.4	148	42.8
Poverty	19	5.5	198	57.3	129	37.2
Mean percentage		**23.5**		**31.2**		**45.3**

4.6 Uptake of cervical cancer screening

Among the participants, 69.4% (240) had never been screened for cervical cancer while 30.6% (106) had screened for cervical cancer before (Figure 4.2).

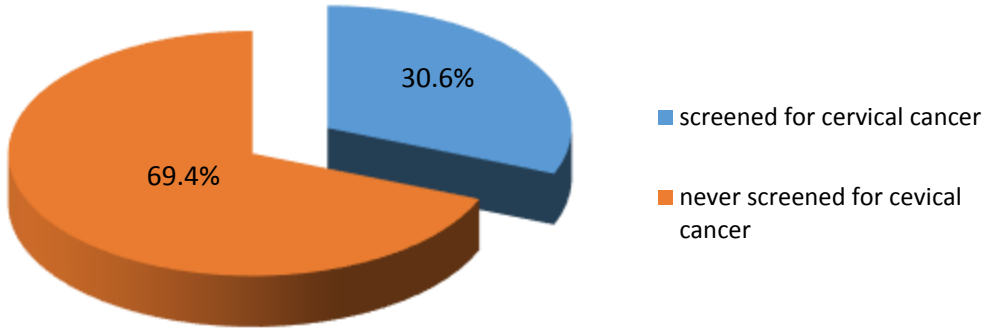

Figure 4.2: Practice of Pap smear testing

The uptake of Pap test screening was low with only 31% had ever screened before for cervical cancer.

4.6.1 Cervical cancer screening perceptions and experiences

The results shows that more than half of the participants 58.7% (203) considered themselves to be at risk of cervical cancer, however, 41.3% (143) of the participants did not. Despite a greater percentage perceiving themselves at risk only 30.6% (106) of the sample had ever been screened in their lifetime and 69.4% (240) had never been screened. Majority (80 participants) representing 57% of the women who had ever been screened for cervical cancer said that they lastly got screened two years ago. About 24% of the participants (33) had been screened more than five years ago, 18% of participants

(25) had been screened three years ago while only one respondent got screened for cervical cancer a year ago.

The reasons given for not screening previously was that they did not have information about the test and where to go for the test 41.3% (97) and 23.4% (55) respectively. Other felt the test was expensive 24.3% (57), didn't have time to go for the test 22.5% (53) while others stated that they didn't feel necessary to go for screening 11.9% (28). A small percentage stated that they did not feel sick 1.7%.

Of those who screened previously majority stated that the procedure was painful 37.7% (40), procedure embarrassing 32.1% (34), negative attitudes or experiences 7.5% (8), results not received 7 (6.6%) while 17 (16.1%) were satisfied with the screening. Intentions for future screening were established, and most of the women were willing to test 72% (242) while other did not have the intention to screen in the future 28% (99). Among those who would screen for cervical cancer, a majority would go for the test as a preventive measure 45.8% (111) while 30.6% (74) heard about the test and decided to go for the test. To 16.5% (40) of the sample studied, the test would be done for diagnostic purposes while 7.1% (7) did go for Pap smear test because their doctor recommended they do the test.

Table 4.5: Cervical cancer screening perceptions in the group under study in Embu county N=346

Variable	Response	N	%
Perceives self at risk	No	143	41.3
	Yes	203	58.7
Ever been screened for cervical cancer	Yes	106	30.6
	No	240	69.4
Frequency of cervical cancer screening	More than 5 years ago	8	7.5
	3 years ago	13	12.3
	2 years ago	25	23.6
	1 year ago	60	56.6
Screen for cervical cancer in future	Yes	247	71.4
	No	99	28.6
Reasons for screening	Preventive measure	69	65.1
	Diagnostic measure	3	2.8
	Heard about it	27	25.5
	Doctors recommendation	7	6.6
Experiences after screening.	Attitude of care provider negative and non-caring	8	7.5
	Procedure painful	40	37.7
	Procedure embarrassing	34	32.1
	Results not received/ explained	7	6.6
	Satisfied	17	16.1
Reason for not screening for cervical cancer	Don't know about the test	97	41.3
	Don't know where to go for the test	55	23.4
	Thinks it's not necessary	28	11.9
	Feel embarrassed	32	13.6
	It's too expensive	57	24.3
	I don't feel sick	4	1.7
	I don't have time to go	53	22.5

4.6.2 Frequency of testing among the study participants

Among the participants who had screened for cervical cancer 76.4% (81) of the participants who had screened for cervical cancer had done it once. 13.2% (14) of the participants had been screened twice while 10.4% (11) had been screened for three or more times.

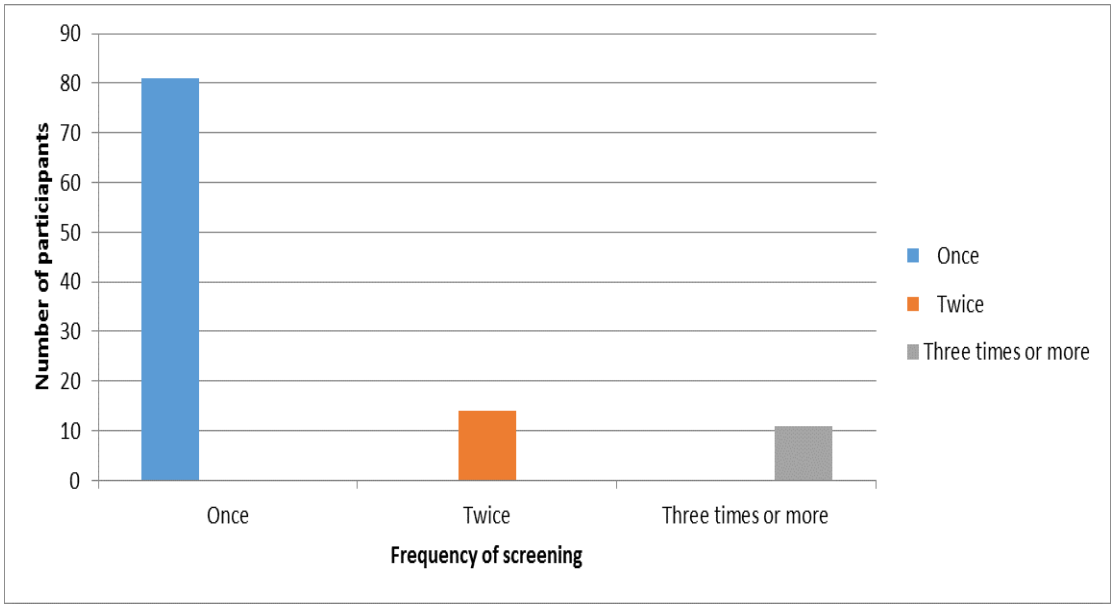

Figure 4.3: Frequency of Pap smear testing

4.6.3 Main source of information about cervical cancer and Pap test screening

The main source of information was obtained at the clinics healthcare personnel 43.3% (125), some got information from friends/relations 25.6% (74), mass media 12.1% (35) and internet 10% (29). 9% (26) of the respondent mentioned print media/books as the source of cervical cancer information (Figure 5). An open- ended question from the questionnaire sought to get any other information the participant were willing to share about cervical cancer and most suggested preferred places where they would learn about cervical cancer and cervical cancer screening.

Preferred places for the dissemination of information on cervical cancer and Pap test screening, a majority of the participants reported that they would prefer learning about cervical cancer at the health facilities. Others preferred a place of worship (church) especially after the church service; markets and at home. The other areas suggested that would be convenient for them to learn about cervical cancer and Pap test screening were schools and campaign/awareness meetings.

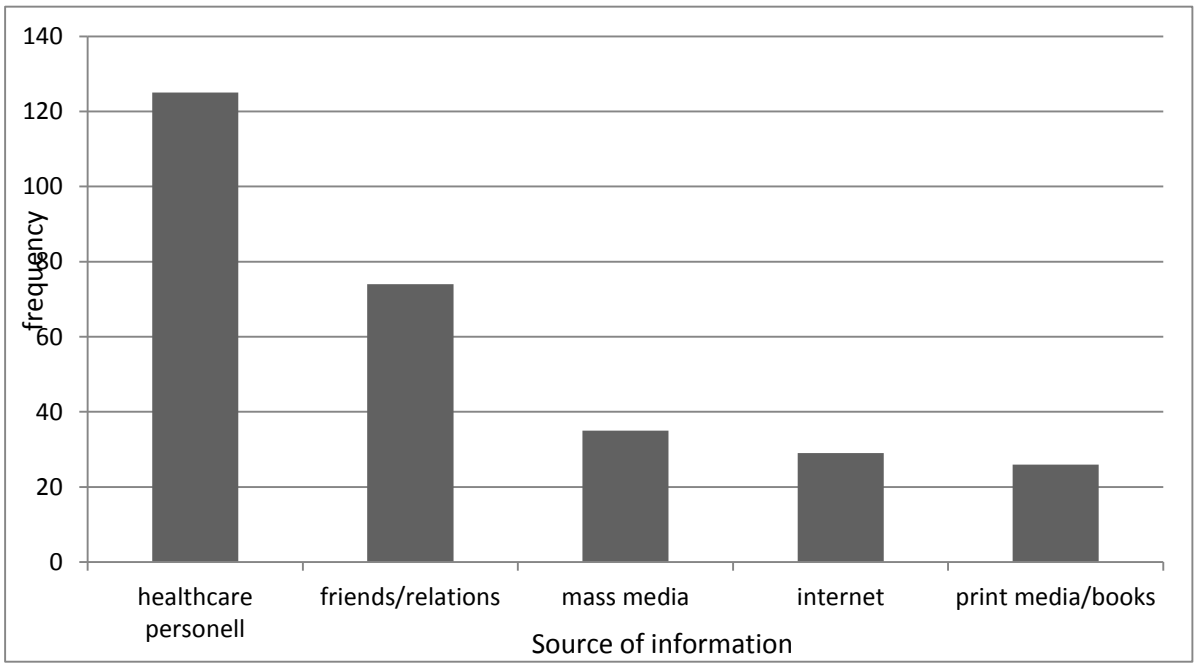

Figure 4.4: Main source of information about cervical cancer and Pap test screening

4.7 Social-economic / cultural factors associated with uptake of Pap test screening

4.7.1 Bivariate analysis

Bivariate analysis with 95% confidence interval was calculated to establish social-demographic determinant associated with previous Pap test screening.

Of women previously screened for cervical cancer, 30.6% had screened for cervical cancer compared to about 69.4% of women who had never screened. The sample was comprised of women from age 18 and above, about 44.4% (16) of women aged 40-49 years had been screened for cervical cancer with a similar proportion 45.5% (5) of women aged >50 years screened. Only 32.0% (48) of women aged 30-39 had screened for cervical cancer with, however only 24.8% (37) of women aged 18-29 had ever screened for cervical cancer. There was statistically significant association, with a p-value of 0.03. There was also no significant relationship between the marital status of women in the study and previous screening for cervical cancer (p=0.154).Half of women with college education 51.9% (54) had been screened with a greater proportion of women with university education 68.0% (17) having screened. However, just 25.8% (34) with secondary education reported ever been screened with only 1.3% (1) with primary education ever screened. 100% (10) women with no education reported not ever been screened for cervical cancer. These differences were statistically significant (p=0.001).

A statistically significant association was observed between employment status and uptake of cervical cancer screening; p= 0.000. There was also statistically significant association observed between women with health insurance and uptake of cervical cancer screening with a p-value of 0.000. The proportion of ever being screened for cervical cancer was 30.0% (90) in women who reported 1-3 parity. There was a slight increase in screening in women with 3-5 parity with 36.4% (16). These differences were not statistically significant (p=0.468).

Table 4.6: Correlates of previous cervical cancer screening (N=346)

Correlates		Previous screening	Total	P-Value
Age(yrs)	No [N (%)]	Yes [N (%)]		
18-29	112(73.8)	37(26.2)	149	p=0.032
30-39	107(66.7)	43(33.3)	150	(2 df)
>40	21(46.8)	26(53.2)	47	
Marital status				
Married	156(65.5)	82(34.5)	238	p=0.154
Single	69(77.5)	20(22.5)	89	(3 df)
Divorced	11(78.6)	3(21.4)	14	
Cohabitating	4(80.0)	1(20.0)	5	
Residency				
Urban	102(75.0)	34(25.0)	136	p=0.067
Rural	138(65.7)	72(34.3)	210	(1df)
Education				
No education	10(100)	0(0)	10	
Primary	74(98.7)	1(1.3)	75	p=0.001
Secondary	98(74.2)	34(25.8)	132	(4 df)
College	50(48.1)	54(51.9)	104	
University	8(32.0)	17(68.0)	25	
Employment status	36(45.0)	44(55.0)	80	
Employed full time	44(63.8)	25(36.2)	69	P=0.001
Employed part time	103(87.3)	15(12.7)	118	(4 df)
Unemployed	19(79.2)	5(20.8)	24	
Others	38(69.1)	17(30.9)	55	
Housewife				
Health insurance				
Yes	86(54.1)	73(45.9)	159	P=0.001
No	154(82.4)	33(17.6)	187	(1 df)
Parity				
1-3	210(70.0)	90(30.0)	300	
3-5	28(63.6)	16(36.4)	44	P=0.445
>5	2(100)	0(0)	2	(2df)

Test statistic; Chi-square(X^2), C.l: 95%, $P < 0.05$

4.7.2 Relationship between awareness of cervical cancer and Pap test screening.

In (Table 4.7), women who were aware of cervical cancer had an increased uptake of screening 34% (99) compared with women not aware 13% (7). This show a positive association between awareness of cervical cancer and having a pap test (OR=3.44, Cl=1.5-7.9), and this association was statistically significant P= 0.004. There was also a positive association between women who perceived themselves at risk of cervical cancer and screening with 4.51 increased odds and this was significant at P= 0.001.

Table 4.7: Relationship between knowledge, perception and screening

		Ever been screened		**Odds Ratio [95% CI]**	**p-value**
Aware of cervical cancer					
		Yes (%)	**No (%)**		
	Yes	99(34)	193(66)	3.44 (1.5-7.9)	0.004
	No	7(13)	47(87)		
Perception					
At risk	**Yes**	86(42)	117(58)	4.51 (2.61-7.82)	0.001
Not at risk	**No**	20(14)	123(86)		

Test statistic; Chi-square(X^2), C.l: 95%, $P > 0.05$

4.7.3 Bivariate analysis to determine the relationship between awareness of risk factors and practice of Pap test screening

A stratified analysis using Mantel-Hansel methods was carried out to determine the relationship between awareness of risk factors and practice of Pap test screening and control for any confounding. Crude stratum-specific and adjusted odds ratios with their corresponding 95% confidence intervals and significance levels were identified among women aware of cervical cancer. The results (Table 4.8) identified that none of the risk factors had a confounding or effect modification on the crude association as the adjusted odds ratio was homogenous across all the strata. This shows that there was no confounding or effect modification on the crude association; hence results show a positive correlation between awareness of cervical cancer risk factors and practice of Pap test screening.

Table 4.8: Mantel-Haenzel test for confounding and effect modification

Variable	**Ever been screened**		**AOR**	**Lower (**95 %CI**)**	**Upper (**95 %CI**)**	**p-value**
Aware of cervical cancer						
	Yes (%)	**No (%)**				
Multiple sexual partners						
Yes	67(49)	69(51)	3.64	2.23	5.93	0.002
No	39(19)	171(81)				
Oral contraceptives						
Yes	21(58)	15(42)	3.52	1.71	7.22	0.002
No	85(27)	225(73)				
Hormonal contraceptives						
Yes	24(57)	18(43)	3.44	1.77	6.67	0.001
No	82927)	222(73)				
STDs						
Yes	66(48)	73(52)	3.37	2.08	5.47	0.001
No	40(19)	167(81)				

Variable		Ever been screened		AOR	Lower (95 %CI)	Upper (95 %CI)	p-value
Heredity							
	Yes	75(45)	90(55)	3.41	2.06	5.63	0.001
	No	31(17)	150(83)				
HPV							
	Yes	54(52)	49(48)	3.46	2.12	5.64	0.001
	No	52(21)	191(79)				
Immunosuppression							
	Yes	48(53)	42(47)	3.36	2.00	5.64	0.002
	No	58(23)	198(77)				
Smoking							
	Yes	59(49)	60(51)	3.49	2.14	5.68	0.001
	No	47(21)	180(79)				
Early Sexual debut							
	Yes	50(51)	47(49)	3.47	2.10	5.72	0.001
	No	56(23)	193(77)				
Early Pregnancy							
	Yes	25(57)	19(43)	3.33	1.73	6.42	0.001
	No	81(27)	221(73)				
Old Age							
	Yes	24(56)	19(44)	3.42	1.77	6.59	0.001
	No	82(27)	221(73)				
Diet							
	Yes	16(59)	11(41)	3.43	1.52	7.72	0.003
	No	90(28)	229(72)				
Poverty							
	Yes	11(58)	8(42)	3.39	1.34	8.53	0.009
	No	95(29)	232(71)				

4.7.4 Multivariate Analysis

Multivariate analysis was used to carry out statistical adjustments when analyzing data that arises from more than one variable with multiple relations. The dependent variable was previously screened for cervical cancer regressed against the independent variables such as social demographic characteristics and awareness of risk factors among women who were aware of cervical cancer to determine likelihood of screening.

Multinomial logistic regression analysis was used to determine predictor variables for having been screened amongst women who were aware of cervical cancer. Variables whose p values were <0.05 were taken into the multivariate model that was built incrementally by adding one explanatory variable at a time, and likelihood ratio test (LRT) was used to determine the most stable model. An LRT of <0.05 was used as the cut-off for determining factors that predicted the likelihood of having a pap smear amongst women who were aware of cervical cancer.

After successful interactions, education level of women, having health insurance and age were the main socio-demographic predicting factors for Pap smear testing when comparing women who had reported having been screened for cervical cancer, to women who had never been screened, (Table 4.8). Women who reported having health insurance were more likely to screen with an LRT of 0.01 and an increased odds of 2.03 (CL; 1.15-3.57). The level of education achieved seemed to increase the likelihood to screen with women with tertiary education and above with an LRT of 0.001 and increased odds of 0.57 (CL; 0.21-1.51). The association was significant at p-value 0.004. Level of screening increased with age with an LRT of 0.03 and odds of 0.37 (0.16-0.86). This was however significant at p-value 0.004.

HPV, Immunosuppression, Smoking, STDs and Multiple sexual partners were risk factors that predicts Pap smear testing with LRT of 0.004 and odds of 2.42 (CL; 1.32-4.44). This association was significant at p-value 0.004. Women who were aware of

these risk factors were more likely to screen for cervical cancer. The result of risk factors associated with previous screening for cervical cancer is presented in Table 4.9.

Table 4.9: Logistic regression for predictor variables that determines Pap screening

Variables N-346	**Odds ratio**	**Lower 95%CL**	**Upper 95%CL**	**P value**
Multivariate model for social-demographic factors that predict screening				
Health insurance				
Yes	2.03	1.15	3.57	0.01
No	(base)			
Education level				
No formal education	-	-	-	
Primary	0.01	0.01	0.07	
Secondary	0.19	0.06	0.49	0.001
Tertiary	0.57	0.21	1.50	
University	(base)			
Age				
18-29	0.37	0.16	0.86	0.03
30-39	0.66	0.29	1.47	
>40	(base)			
Multivariate model for knowledge of risk factors that determine screening				
HPV				
Yes	2.42	1.32	4.44	0.004
No	(base)			
Immunosuppression				
Yes	2.18	1.16	4.11	0.02
No	(base)			
STDs				
Yes	3.57	1.94	6.95	0.001
No	(base)			
Multiple sexual partners				
Yes	2.74	1.52	4.93	0.001
No	(base)			
Smoking				
Yes	1.86	1.02	3.38	0.04
No	(base)			

CHAPTER FIVE

DISCUSSION CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

Cervical cancer, which is preventable and treatable, is the leading cause of cancer-related morbidity and mortality among women in Kenya. Despite this worrying statistics, this study indicates low awareness of cervical cancer risk factors and the practice of Pap smear testing was considerably low among pregnant women in Embu County. This appears to be a problem of developing and underdeveloped worlds as studies done in South Africa by Ndlovu, 2011 and in Ethiopia by Terefe *et al*., 2008 and in Kenya by Ombech, 2012 have shown a similar pattern of lack of awareness.

The prevalence of precancerous cervical lesions among the pregnant women was 6.0%, that is in contrast to a conducted at Nazareth hospital study that showed high prevalence of precancerous cervical cancer but among HIV infected women was found to be 26.7% (Peter et al., 2012). Cervical cancer has a long latent period of about 10-20 years (ICO, 2013) and this could be a possible determinant of the high trend of abnormal cervical lesions among women over 30 years but less than 50. When segmented into age groups, women aged 40-49 had increased abnormal cervical lesions accounting for 38.1% followed by age group 30-39 having 33.3% of the women. The overall findings indicate that Pap test is useful and should be the primary screening test for cervical cancer and pre-cancerous changes among women of reproductive age. The big challenge lying in wait is achieving positive results generated by Colposcopy as a determinant for cervical cancer.

A study by Gatune *et al*. in 2005 demonstrated inadequate knowledge of women on cervical cancer as well as on screening for premalignant cervical lesions in Africa and especially Sub-Saharan Africa. Women's knowledge of cervical cancer and even more

about cervical screening tests is very limited in many developing countries (Amarin *et al*., 2008; Wong *et al*., 2009). Conversely, findings indicated that a significant number representing 84% of women were aware of cervical cancer in general. This high awareness level could be attributed to the study population being literate as a majority of them (75%) had a secondary level of education and above.

This study further sought to find out if the Women knew of Pap smear screening and only 42% of the participant had heard about the screening test. This in contrast with the high score of Pap test screening awareness in Kasarani, Kenya reported by Ombech *et al*. in 2012, which found out that 80% of study participants knew of Pap smear as a screening test. This could be attributed by the high literacy level of the women from the study group. The Pap smear test is one of the most effective cancer screening tests, and its ability to detect premalignant conditions has contributed to the decline in cervical cancer morbidity and mortality. According to American Cancer Society 2009, the introduction of the Pap test as a screening method, contributed to the decrease in the cervical cancer death rates in the United States, citing a 74% declines in the mortality rates over the past five decades.

Cervical cancer is an important public health concern for women in sub-Saharan Africa in yet the current study found a low level previous cervical cancer screening even among the selected population, consisting women already seeking reproductive health services. Only 30% of the participants reported having screened with a majority (81%) having done the test only once. This cervical cancer screening rate is far too small and does not reach the Ministry of Health goal of screening at least 75% or more of eligible women for cervical cancer. Many studies have shown that knowledge and awareness of cervical cancer and Pap testing positively influence the utilization of screening services (Idestrom *et al*., 2002, Wong *et al*., 2009, Aboyeji *et al*., 2004). This study indicated that women's knowledge and awareness of cervical cancer screening was significantly associated with uptake of screening or screening status (OR 3.44; p= 0.004). This means that women who are aware of cervical cancer and screening were more likely to undergo

screening for the disease. In a qualitative study carried out in Malaysia, lack of knowledge about cervical cancer and the Pap smear test was reported among the respondents (Wong *et al*., 2009). This gap in knowledge was one of the most important determinants of low screening status.

Knowledge of risk factors for cervical cancer development has also been observed to be associated with better uptake of screening services (Gatune *et al*. 2005).In this study, women that were aware of HPV infection, smoking, Immunosuppression and history of sexually transmitted diseases as risk factors were more likely to go for a Pap smear test with the association being significant. In a study conducted among female primary school teachers in Kasarani division, Nairobi Kenya the multivariate analysis revealed that previous Pap smear testing was significantly more likely if the patient was aware of cervical cancer (OR 1.04) although the association was not significant (Ombechi *et al*. 2012). Results showed that age and age of the woman at the birth of the first child were the main predictor socio-demographic factors for Pap smear testing with an LRT of 0.03 and increased odds of 1.2. HPV, diet, and sexually transmitted infections were the predictor factors for the risk factors for the Pap smear testing with an LRT of 0.02 and odds of 1. This was although not significant (p-value 0.9). However, from the current data show that knowledge of cervical cancer risk factor was extremely low (23%). The fact that most women did not know of the risk factors for cervical cancer could be associated with low uptake of screening as most women may not consider themselves susceptible to cervical cancer.

There are a number challenges in the findings relating to the awareness and perceptions of cervical cancer and Pap test screening. The women enrolled in this study showed that only 30% of them had ever had a Pap test done, with only 10% of them had done the test more than three times. Moreover, only a significant 56% had done a test within a years' time, In fact, 7.5% had their last test more than five years ago. This trend can be attributed to the assumption that a single test is enough; however Pap tests should be done at least yearly. The findings suggest the need to emphasize regular testing in

addition to early diagnosis and treatment. The American Cancer Society set benchmark advice's that women should begin annual screening for cervical cancer with the Pap test at the age of 18, or after the onset of sexual activity, whichever comes first. After three consecutive negative Pap tests, screening can be performed less frequently at the discretion of the physician (Smith *et al*., 2002).

Women's perceptions of the screening services, awareness of the risk factors for the disease, having financial resources and support from the spouse are other significant factors in determining the use of available facilities (Ezem 2007, Winkler *et al*., 2008). The participants in this study reported critical barriers including inadequate knowledge of cervical cancer risk factors and benefits of Pap smear test. Others reported they did not know about the test or where to go for the test, it is expensive, felt embarrassed and a number had no time to go for screening. Factors reducing women's participation in cervical cancer screening programs include poor awareness of the indications and benefits of the cervical smear test. Others include, lack of knowledge of cervical cancer and its risk factors, fear of embarrassment, pain, or cancer; anxiety caused by receiving an abnormal cervical smear result; and poor understanding of cervical screening procedures (Augusto *et al*., 2013, Ngugi *et al*., 2012, Ombechi *et al*., 2012).

The current finding is similar to Miller study in 2002 suggesting that women of reproductive age, in our case pregnant women, are exposed to a majority of the risk factors; hence high coverage of these women at risk of cervical cancer is a key element in achieving a successful screening program. Factors that have continuously inhibited women participation include poor awareness of the indications and benefits of the cervical smear test; lack of knowledge of cervical cancer and its risk factors, fear of embarrassment, pain, or cancer; anxiety caused by receiving an abnormal cervical smear result; and poor understanding of cervical screening procedures (Kibicho *et a*l., 2014, Rositch *et al*., 2012, Were *et al*., 2011). Failure by women to face pelvic In lieu of this has been attributed to male opposition to women seeking medical attention out of ignorance and suspicion.

Cervical cancer incidence rates have been observed to vary between different socio-economic groups, and the importance of these factors may vary between different geographical regions (Parikh *et al*., 2003). The danger of not knowing risk factors is that chances of prevention of behavioral risk factors are almost non-existent. Lack of accurate knowledge of the risk factors for cervical cancer was demonstrated by a (77%) majority of the women in the study. This then results in a greater proportion of women at risk of cervical cancer. In this study, some of the participants (56%) thought that cervical cancer could not be prevented, and also 58% perceived themselves not at risk. This finding is consistent with a study done among women of reproductive age residing in Mombasa County, Kenya (Alusa *et al*., 2014), which reported a perceived risk of 58.6%. Such sentiments prevent women from going for screening since they have misconceptions about cancer in general. Perception of not being at risk is documented to be associated with low uptake of screening (Chizoma *et al*., 2012, Lartey *et al*., 2003, Winkler et al. 2008). The findings suggest, however, that knowledge alone is not the major factor determining whether a woman will go for cervical screening.

It is worthwhile to note that the interpretation of these study findings is limited in several ways. Firstly, the findings are only preferable to women who accepted to be interviewed and eventually to undergo screening using the Pap test approaches. It is likely that women refusing to participate in the testing were significantly different from those interviewed hence curtailing the generalizability of the study. Secondly, it has previously been shown that self-reports overestimate participation in cervical cancer screening. Moreover, some of the women may not have been able to distinguish between pap smears, pelvic examination, and vaginal swab, and this may also have led to overestimation. Nevertheless, the study still provides some insights into the barriers to cervical cancer screening in Embu County.

5.2 Conclusion

The prevalence of precancerous cervical cancer 6.0%.Although most cytological results from this study were mildly abnormal (ASC-US or LSIL), cervical dysplasia can serve as an indication that increased attention is needed. Greater access to routine Pap smears test is undeniably important to early detection and prevention of cervical cancer.

Knowledge about cervical cancer was high 84% (292) among the women; however, the knowledge of Pap smear test and cervical cancer risk factors were low (42% and 23%) respectively. There was a strong correlation between awareness of cervical cancer and practice of Pap smear test with 3.44 increasing odds. This study also identified that there was a correlation between awareness of cervical cancer risk factors and practice of Pap test screening.

The uptake of Pap smear is abysmally poor according to the findings, only 30% (106) had ever had a Pap test done suggesting that majority of the women had never screened for cervical cancer among the target population. The factors associated with uptake of the Pap test were age, the level of education, health insurance. Others included, aware of HPV, Immunosuppression, smoking, STDs and Multiple sexual partners risk factors.

More than half of the women 58.7% considered themselves at risk for cervical cancer and a majority showed a willingness to screen in the future 71.4%. Barriers identified for not screening included, not knowing about the test (41%), thinks it's too expensive (24%) and other didn't know where to go for the test (23%). A majority of the women obtained information about cervical cancer and Pap test from health care personnel 43.3%.

5.3 Recommendations

The commitment to prevent and treat cervical cancer deserves attention and support. Unnecessary suffering and death will only be prevented when all women and girls are provided access to information, services and tools to prevent cervical cancer. Based on the conclusion of this study, the following recommendations are suggested:

1. Increased awareness in the target population on the awareness of cervical cancer, risk factors and the importance of Pap test screening. This can be achieved considering that women attendance rate for the antenatal clinic is high 89% (EDDP) within the Embu County.
2. 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.
3. Aggressive awareness campaigns and education programs to enlighten the public about cervical cancer screening should be broad to encompass risk factors and modes of prevention of the disease
4. Cervical cancer screening and treatment should be incorporated into the Maternal Child Health program.
5. Development of population-based cervical cancer screening programme.
6. Increase health insurance coverage for poor population in rural areas.

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APPENDICES

Appendix 1: Role of investigators

Mugo Alex Gitonga is a Master of Science (Epidemiology) student at JKUAT/KEMRI here in referred to as the Principal Investigator for this work. He will conduct research based on the procedures in this protocol as part of his Degree requirement.

Dr. Peter Wanzala is an Epidemiologist at Kenya Medical Research Institute- CPHR and a co-investigator in this project. He will give technical advice to the PI.

Prof. Joseph Gikunju is a Lecturer at the Institute of Tropical Medicine and infectious Diseases (JKUAT) and a co-investigator. He will provide the research team with a key link between JKUAT and KEMRI administration. He will also provide technical assistance and advice.

Appendix 2: Informed Consent Form

Principal investigator: MUGO ALEX GITONGA

Title: FACTORS ASSOCIATED WITH UTILIZATION OF PAP TEST FOR CERVICAL CANCER SCREENING AMONG PREGNANT WOMEN IN EMBU COUNTY

Introduction:

Good morning /afternoon?

My name is Mugo Alex Gitonga and I am a student at the Jomo Kenyatta University of Agriculture and Technology (JKUAT), Institute of Tropical Medicine and Infectious Diseases (ITROMID) located in Kenya Medical Research Institute (KEMRI). I am here with my research team to conduct a study on awareness of cervical cancer risk factors and practice of Pap test screening among pregnant women in Embu County. I would like to seek your permission, please read the consent form below. This form will give you information you need, so that you can make a decision on whether to participate or not in the study. There are no wrong or right answers. You will be given time to consider if you will like to be in this study. Please read the form well and ask where you don't understand please be honest and truthful in answering the questions. I assure you that the information you will give will be totally confidential and will not be required to identify yourself by name. Your participation is voluntary and you may therefore refuse to answer any question or stop the interview at any time without suffering any consequences.

The purpose of the study

The aim of this study is to assess women's awareness and knowledge regarding cervical cancer risk factors and Pap smear testing and better understand factors influencing access to and utilization of cervical cancer screening services by women. The information you provide will therefore be of benefit to you and also aid in providing

insights into the factors associated utilization of cervical cancer screening services and help form a basis for formulating informative policies.

Procedure

If you agree to be a participant in this study, we will ask you to fill in the questionnaire regarding women's awareness and knowledge regarding cervical cancer risk factors and Pap smear testing and better understand factors influencing access to and utilization of cervical cancer screening services. After the question you will be screened for precancerous lesions. The screening process involves insertions of the speculum in your vagina to view the cervix and collect cells in a slide which will then be preserved and transported to the laboratory for examination. Any abnormal results will be communicated back for treatment and follow up. To ensure complete confidentiality your name will not be used but an identification number will be assigned to label the questionnaire. The information you give will recommend and design appropriate interventions to promote cervical cancer screening.

Benefits

During this procedure there will be no physical harm. Detecting cervical cancer early using a pap test gives you a greater chance at a cure. A pap test can also detect changes in your cervical cells that can suggest cancer may develop in the future. The study will also help you to understand the importance of utilization of cervical cancer screening services as we shall answer any questions you have. The study will also benefit the public as we will recommend and design appropriate interventions to promote cervical cancer screening. The results will also be used in writing my thesis as part of requirements by the university.

What are the risks of the study?

Apart from the inconveniences caused by taking part of your time, the process is safe and there are no risks involved. There will be monetary reimbursement for travelling cost incurred if you opt to undertake the screening on another day. Some questions may also appear uncomfortable but it is necessary for you to answer them with honesty. However, we will try as much as we can to make sure we save on your time.

What about confidentiality?

All the information obtained will be strictly confidential and data password protected only accessed by the Principal investigator, participants in the study will be kept anonymous, being identified only by specific numbers assigned by the principal investigator.

Instructions

When you sign below it shows that you have agreed to participate in the study. If you do not understand any part of the information that has been read to you or you have read, be sure to ask questions. Do not sign until you have understood all that is expected or required. I wish to take part in the study entitled: Awareness of cervical cancer risk factors and practice of Pap test screening among pregnant women in Embu County during which I can withdraw my consent without any consequences. I have understood the information given in this sheet and I give my consent to be interviewed.

VOLUNTARIES

Your participation is voluntary, and you may therefore refuse to answer any question or stop the interview at any time without suffering any consequences.

CONTACT INFORMATION

For any questions or concerns about the study or in the event of a study-related injury, the following person is available for contact

Principal Investigator- MUGO ALEX GITONGA

Telephone- 0727409692

Email: alexmugo01@yahoo.com

For any questions pertaining to rights as a research participant, the contact person is

The Secretary,

KEMRI Ethics Review Committee

P.O. BOX 54840-00200 Nairobi.

Tel: (254) (020) 2722541, 0722-205 901, 0733-400003

Email: erc@kemri.org

At this point, do you want to ask me anything about the study?

Subject permission:

I, the undersigned have understood the above information which has been fully explained to me by the investigator. I have agreed to voluntarily consent to participate. I was given the chance to ask questions and I received satisfactory responses.

Name of Participant or respondent.....

Signature.....Date.....

Signature of the person obtaining consent _____ Date _____

(Must be signed by the investigator or individual who has been designated to obtain consent)

Appendix 3: Questionnaire

TITLE: FACTORS ASSOCIATED WITH UTILIZATION OF PAP TEST FOR CERVICAL CANCER SCREENING AMONG PREGNANT WOMEN IN EMBU COUNTY

Cervical cancer questionnaires Date filled……. Code no……		
Section 1: Socio-demographics		
1. Age	18 – 29 30 – 39 40 – 49 +50	[1] [2] [3] [4]
2. Religion	Christian Muslim Others Specify ……	[1] [2]
3. What is your marital status?	Married Single Divorced/ Separated Cohabitating Widowed	[1] [2] [3] [4] [5]

4. Residency	Urban area Rural area	[1] [2]
5. How long have you lived in the county?	3 months 3- 9 months >1 year	[1] [2] [3]
6. What is the highest standard of education attained?	No formal education Primary Secondary College University	[1] [2] [3] [4] [5]
7. How can you describe your employment status at present?	Employed full-time Employed part-time Unemployed Student Other Specify_____	[1] [2] [3] [4] [5]
8. If answer to Q6 above is "yes". How much do you earn per month?	KShs 5000 and less KShs 5001- KShs 10000 KShs 10001- KShs 20000 KShs 20001-Ksh 30000 More than KShs 30000 Specify_____	[1] [2] [3] [4] [5]

9. Do you have a health insurance?		Yes No		[1] [2]
10. Have you ever been pregnant?		Yes No		[1] [2]
11. If answer to Q8 "Yes" explain your parity.		1-3 4-5 Above 5		[1] [2] [3]
12. How old were you when you first had your first child?		Age (specify)		……..
Section 2: Knowledge				
13. Ever heard of cervical cancer?		Yes No		[1] [2]
14. What basic test is conducted to screen for cervical cancer?		Blood test Urine test Pap smear test Don't know		[1] [2] [3] [4]
15. What are the risk factors associated with cervical cancer do you know?	Tick all that apply a) Multiple sexual partners b) Use of oral contraceptives c) Use of hormonal contraceptives	<u>True</u>	<u>False</u>	<u>Don't know</u>

	d) STDs e) Inherited f) Human Papilloma virus g) Immunosuppression h) Smoking i) Early sexual debut j) Early pregnancy k) Old Age l) Diet m) Poverty			
16. Can cervical cancer be prevented?	Yes No Don't Know			[1] [2] [3]
17. Have you ever screened for cervical cancer?	Yes No			[1] [2]
18. If answer to Q15 "Yes" how many times?	Once Twice >3			[1] [2] [3]
19. How often do you think women should screen for cervical cancer?	Once Twice >3			[1] [2] [3]

20. When was the last time you screened for cervical cancer?	>5 years ago 3 year ago 2 years ago 1 year ago	[1] [2] [3] [4]
Section 3: Perception and experiences		
21. Do you think you are at risk of cervical cancer?	Yes No	[1] [2]
22. Would you screen for cervical cancer in future?	Yes No Don't know	[1] [2] [3]
23. If answer to Q22 "Yes" give reasons	Preventive measure Diagnostic measure Heard about it Doctors recommendation	[1] [2] [3] [4]
24. If answer to Q17 "Yes" describe your experiences.	Attitude of care provider negative and non-caring Procedure painful Procedure embarrassing Results not received/ explained Other Specify ……. …….	[1] [2] [3] [4] [5]

25. If answer to Q17 is "No" give reasons.	Tick all that apply	
	Don't know about the test	[1]
	Don't know where to go the test	[2]
	Thinks it's not necessary	[3]
	Feel embarrassed	[4]
	It's too expensive	[5]
	I don't feel sick	[6]
	I don't have time to go	[7]
	Not allowed by religion/culture	[8]
	Lack of husband/partner approval	[9]
26. Source of information about cervical cancer and pap test	Health care personnel	[1]
	Friends / Relations	[2]
	Mass media	[3]
	Internet	[4]
	Print media/ Books	[5]

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

……

……

END. Thank you for your time

KIAMBATISHO **1: UTANGULIZI NA IDHINI**
FOMU YA RIDHAA

KICHWA: HATARI YA SARATANI YA NJIA YA UZAZI NA UTUMIZI WA KIPIMO CHA PAP KATI YA WAKE WAJA WAZITO KATIKA JIMBO LA EMBU**.**Mchunguzi mkuu: Mugo Alex Gitonga

Utangulizi:

Habari za asubuhi / mchana?

Jina langu ni Mugo Alex Gitonga na mimi ni mwanafunzi katika Chuo Kikuu cha Jomo Kenyatta cha Kilimo na Teknolojia (JKUAT. Niko hapa na timu yangu kufanya utafiti juu ya HATARI YA SARATANI YA NJIA YA UZAZI NA UTUMIZI WA KIPIMO CHA PAP KATI YA WAKE WAJA WAZITO KATIKA JIMBO LA EMBU**.** Fomu hii yakupa idhini unayohiyaji ili kushiliki au kutoshiriki kwenye utafiti huu. Elewa kuwa hakuna jibu lisilo sahihi. Utapewa muda wa kutosha ili kuithinisha kushiriki kwako kwenye utafiti huu. Soma fomu hii kwa utaratibu na unaruhusiwa kuuliza swali lolote usipoelewa. Tafadhali jibu maswali yote kwa uaminifu na ukweli. Habari zote zitakazopatikana zitakuwa za siri kwani hatutahitaji majina yako kwenye fomu.

Madhumuni ya utafiti

Lengo la utafiti huu ni kuelewa sababu yahatari ya saratani ya njia ya uzazi na utumizi wa kipimo cha pap kati ya wake waja wazito katika jimbo la embu . Habari utakayotoa itakuwa na manufaa kwa wewe na pia itasaidia katika kutoa utambuzi katika mambo yanayohusiana na saratani ya njia ya uzazi na kipimo cha pap na kusaidia msingi wa kutunga sera na taarifa.

Utaratibu

Madhumuni ya fomu hii ni kupata idhini yako ya kushiriki. Ukichagua kushiriki, dodoso itakuwa inasimamiwa na wewe na mahojiano itachukua muda wa dakika kati ya 10 na 20 kukamilisha.

baada ya maswali utapendekezwa kupimwa saratani kwa ihari yako ukitumia kipimo caha Pap. Kipimo hicho kitahusisha kuingiza kifaa speceli kwenye njia ya uzazi na kutoza seli ambazo zitahifadhiwa na kusafirishwa kwenye maabara kwa majaribio. Majibu yoyote itakayo inaonyesha dalili za saratani yataelezwa kwa wahusika kwa

matibabu. Ushiriki ni wa hiari na unaweza kuchagua kujibu swali lolote au maswali yote. Hata hivyo, tunatarajia kuwa utashiriki katika mahojiano haya kwa maana maoni yako ni muhimu.

Hakuna majibu sahihi au makosa kwa maswali, na sisi tunalenga juu ya mawazo yako binafsi na mitazamo. Kama hutaelewa swali, tafadhali niambie; na unaweza kuongeza taarifa zaidi katika hatua yoyote.

Faida

Hakuna faida kwako moja kwa moja kwa kuchagua kushiriki katika utafiti huu. Kugundua saratani katika njia ya uzazi ukitumia kipimo cha Pap yakuezesha kupata kinga mapema. Kipimo cha pap pia chaweza kugundua badiliko kwenye njia ya uzazi ambayo itapendekeza uwezekano wa kuugua saratani kwa miaka ijao. Hata hivyo, matokeo ya utafiti huu yatawasilishwa kwa KEMRI ambao pia itachukua hatua kulingana na matokeo. Matokeo yake pia itatumika katika kuandika ripoti yangu kama sehemu ya mahitaji na chuo kikuu.

Je, nini hatari ya utafiti?

Mbali na kuchukua sehemu ya muda wako, mchakato ni salama na hakuna hatari ya kushiriki. Lakini baadhi ya maswali yanaweza kuonekana wasiwasi lakini ni muhimu kwa ajili yenu kuyajibu kwa uaminifu. Hata hivyo, mimi nitajaribu kuhakikisha nimetumia mda mdogo.

Nini kuhusu siri?

Habari zote zitakazopatikana zitakuwa za siri, zitalindwa na kupatikana tu kwa mpelelezi Mkuu; washiriki katika utafiti hawatajulikana majina, watatambuliwa tu na nambari maalum ya kupewa na mpelelezi mkuu.

Kuwasiliana habari

Kwa maoni yoyote katika tukio la maswali ya utafiti kuhusiana, maoni au malalamiko, watu wafuatao watapatikana kuwasiliana nao:

Mpelelezi Mkuu- Mugo Alex Gitonga

Simu: 0727409692
Email: alexmugo01@yahoo.com

AU
Katibu Mkuu,
Taifa ya Maadili ya Kamati ya Uchunguzi
P.O. BOX 54840-00200 Nairobi
Tel: (254) (020) 2722541, 0722-205 901, 0733-400003
Email: erc@kemri.org

Katika hatua hii, unataka kuniuliza kitu chochote kuhusu utafiti?

Ruhusa na Muhusika

Mimi niliyetia kuelewa habari hapo juu ambayo imekuwa kikamilifu akanieleza kwa uchunguzi. Mimi nimekubaliana kwa hiari kukubali kushiriki. Nilipewa nafasi ykuuliza maswali nikapata majibu ya kuridhisha.

Jina la Mshiriki..... .....

Tarehe ....

Sahihi ya mtu kupata idhini _____ Tarehe _____

(Lazima saini na mpelelezi au mtu binafsi ambaye amekuwa mteule kupata kibali)

KIAMBATANISHI: DODOSO

Cervical cancer questionnaires Siku …… Codi ……		
1. Umri.	18 – 29 30 – 39 40 – 49 +50	[1] [2] [3] [4]
2. Dini.	Mkristo Islamu Ingine ……..	[1] [2] [3]
3. Hadhi yako ya ndoa	Sijaoa Ndoa Mjane Achana	[1] [2] [3] [4]

4. Aina gani ya eneo?	Mjini Kijijini	[1] [2]
5. Je, umeishi kwa muda gani kaika eneo hii?	< 3 Miezi 3- 9 Miezi >1 Mwaka	[1] [2] [3]
6. Je, ngazi ya juu zaidi ya elimu uliyohitimu ni ipi?	Hakuna Msingi Secondari College Chuo kikuu	[1] [2] [3] [4] [5]
7. Hadhi yako ya ujira.	Ajiriwa Ajiriwa kwa muda Bila ajira Mwanafunzi Ingine ……	[1] [2] [3] [4]
8. Kama jibu lako Q4 “ndio”. Unapata mshara wa pesa gapi kila mwezi?	Ksh 5000 and less Ksh 5001- Ksh 10000 Ksh 10001- Ksh 20000	[1] [2] [3]

	Ksh 20001-Ksh 30000 Zaidi ya Ksh 30000 Ingine ……..	[4] [5]
9. Je, umeekeza kinga ya afya.?	Ndio La	[1] [2]
10. Je, uko na watoto?	Ndio La	[1] [2]
11. Kama swali la Q8 "ndio" eleza uko na watoto wangapi?	1-3 4-5 Zaidi ya 5	[1] [2] [3]
12. Umri gani ulipata mtoto wa kwanza?	Umri (eleza)	…….
13. Je, wajua ugonjwa wa saratani katika njia ya uzazi?	Ndio La	[1] [2]
14. Je, mtu hupimwaje njia ya uzazi?	Kwenye damu Kwenye mkojo Pap smear Sijui	[1] [2] [3] [4]

15. Je, wajua kinachosababisha saratani katika njia ya uzazi?	Jibu zote zinazotumika a) Uvutaji sigara b) Umri c) HPV d) Kushiriki ngono mapema e) Kupata mimba ukiwa mchanga f) Umaskini g) Kizazi h) Kutumia njia za kuzuia uzazi i) Chakula duni j) Magonjwa k) Magonjwa ya ngono	Ndio	La	Sijui
16. Je, saratani katika njia ya uzazi yaeza kuzuiwa?	Ndio La Sijui			[1] [2] [3]
17. Je, umepimwa saratani katika njia ya uzazi?	Ndio La			[1] [2]

18. Kama jibu lako to Q17 ndio eleza mara ngapi?	Moja Mbili > Tatu	[1] [2] [3]
19. Je, mwanamke apaswa kupimwa mara ngapi?	Moja Mbili > Tatu	[1] [2] [3]
20. Mara ya mwisho kupimwa njia ya uzazi ilikua lini?	> Miaka 5 Miaka 3 Miaka 2 Mwaka 1	[1] [2] [3] [4]
21. Je, unafikiri uko kwenye hatari ya kuabukizwa saratani katika njia ya uzazi?	Ndio La	[1] [2]
22. Je, utapimwa saratani katika njia ya uzazi kwa siku zijazo?	Ndio La Sijui	[1] [2] [3]
23. Kama jibu lako Q22 “ndio” eleza kwa nini upimwe njia ya uzazi.	Kujikinga Matibabu Kuskia kuhusu ugonjwa Agizo la daktari	[1] [2] [3] [4]

24. Kama jibu lako Q17 “ndio”, eleza ulivyohisi.	Wahuduma hawakua wazoefu. Mtindo chungu Mtindo wenye aibu Majibu kutopata/kuelezewa Zingine Eleza ……. …….	[1] [2] [3] [4] [5] [6]
25. Kama jibu lako Q17 ni “la” eleza sababu.	Jibu zote zinazotumika Sijui kuhusu kipimo Sijui wapi kwa kwenda Kupimwa Sio muhimu kupimwa Aibu kupimwa Ni gali sana Sijihisi mgonjwa Sina wakati wa kwenda kupimwa	 [1] [2] [3] [4] [5] [6] [7] [8]

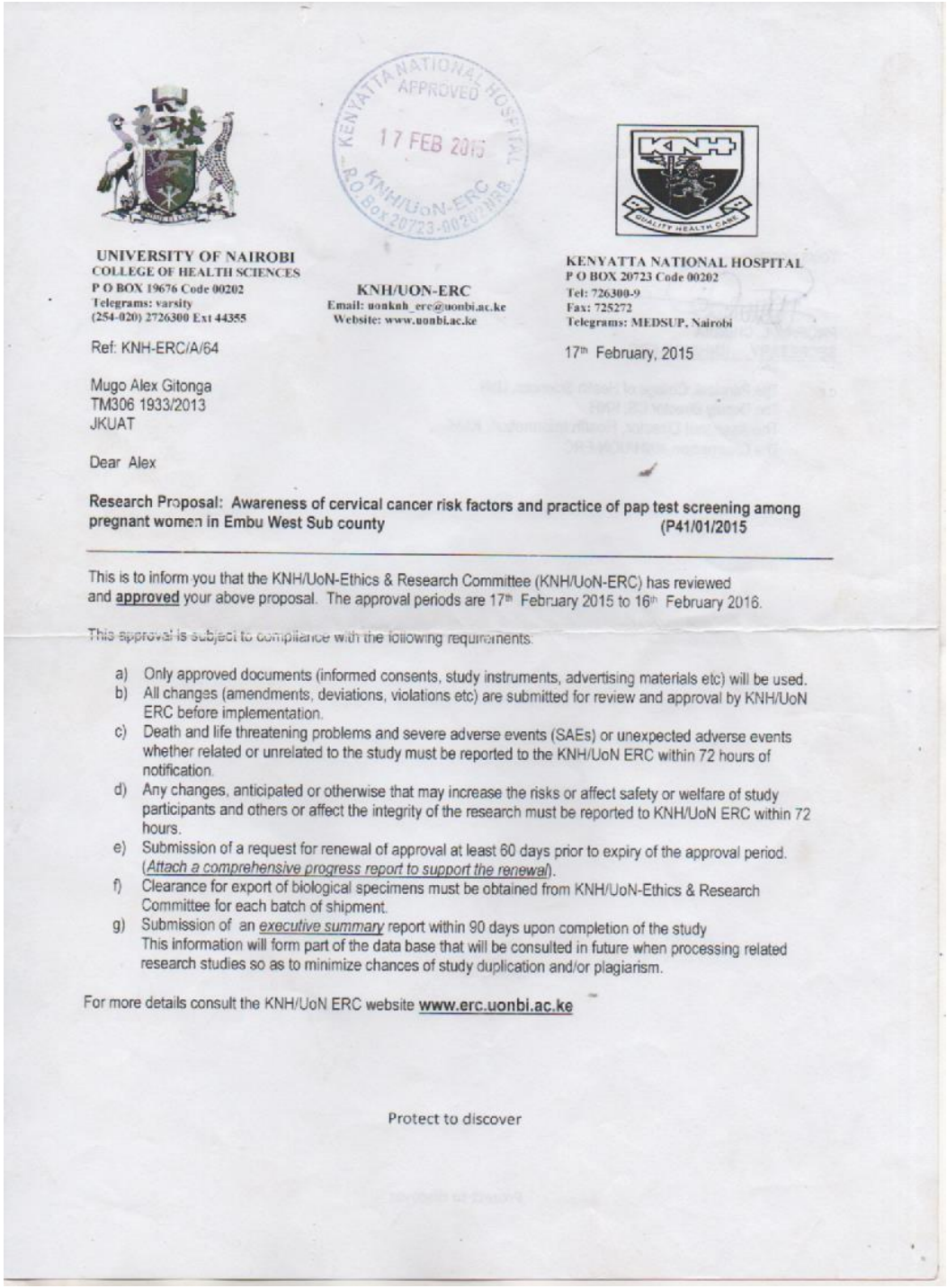
	Kukatazwa na dini/utamaduni Kutokubalishwa na mume/mshirika	[9] [10]
26. Ulipata maarifa kuhusu saratani katika njia ya uzazi na Pap test kutoka wapi?	Televisheni na redio Wafanyakazi wa afya Magazeti/vitabu Marafiki/ familia na jamii Mtandao	[1] [2] [3] [4] [5]

27. Je una habari ingine yeyote unaeza kuongeza kuhusu kupimwa saratani katika njia ya uzazi katika eneo hii?

……
……
……

MWISHO. Asanti kwa wakati wako

Appendix 4: Letter of Approval



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

Ref: KNH-ERC/A/64

17th February, 2015

Mugo Alex Gitonga
TM306 1933/2013
JKUAT

Dear Alex

Research Proposal: Awareness of cervical cancer risk factors and practice of pap test screening among pregnant women in Embu West Sub county (P41/01/2015

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 17th February 2015 to 16th February 2016.

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.erc.uonbi.ac.ke**

Protect to discover

Yours sincerely

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

c.c. The Principal, College of Health Sciences, UoN
The Deputy Director CS, KNH
The Assistant Director, Health Information, KNH
The Chairperson, KNH/UON-ERC

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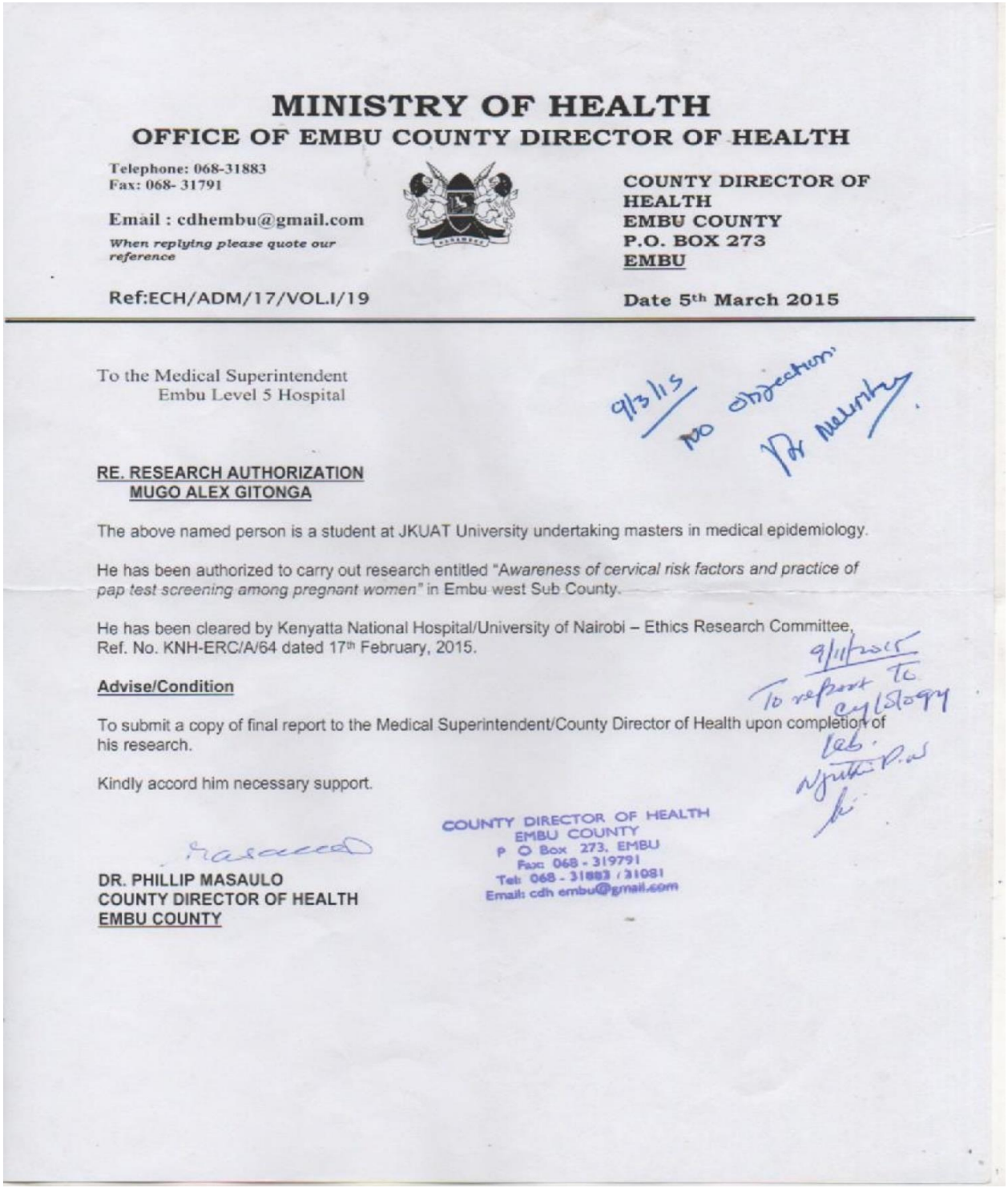
Appendix 5: Reseach Authorization



MINISTRY OF HEALTH
OFFICE OF EMBU COUNTY DIRECTOR OF HEALTH

Telephone: 068-31883
Fax: 068- 31791

Email : cdhembu@gmail.com
When replying please quote our reference

COUNTY DIRECTOR OF HEALTH
EMBU COUNTY
P.O. BOX 273
EMBU

Ref:ECH/ADM/17/VOL.I/19

Date 5th March 2015

To the Medical Superintendent
Embu Level 5 Hospital

9/3/15 no objection Dr Nduriry

RE. RESEARCH AUTHORIZATION
MUGO ALEX GITONGA

The above named person is a student at JKUAT University undertaking masters in medical epidemiology.

He has been authorized to carry out research entitled "*Awareness of cervical risk factors and practice of pap test screening among pregnant women*" in Embu west Sub County.

He has been cleared by Kenyatta National Hospital/University of Nairobi – Ethics Research Committee, Ref. No. KNH-ERC/A/64 dated 17th February, 2015.

9/11/2015 To report To cytology lab. Njuthi P.O

Advise/Condition

To submit a copy of final report to the Medical Superintendent/County Director of Health upon completion of his research.

Kindly accord him necessary support.

Masaulo

DR. PHILLIP MASAULO
COUNTY DIRECTOR OF HEALTH
EMBU COUNTY

COUNTY DIRECTOR OF HEALTH
EMBU COUNTY
P O Box 273, EMBU
Fax: 068 - 319791
Tel: 068 - 31883 / 31081
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E-mail: director@kemri.org, info@kemri.org, Website. www.kemri.org

KEMRI/AJHS/CORRESP/2016/VOL 1

26th November 2016

Alex Mugo,
JKUAT,
P.O BOX 62000-00200,
Nairobi

Dear Alex Mugo,

REF: AJHS/2016/485 'AWARENESS OF CERVICAL CANCER RISK FACTORS AND PRACTICE OF PAP TEST SCREENING AMONG PREGNANT WOMEN IN EMBU COUNTY' BY ALEX MUGO ET AL.

We are pleased to inform you that your manuscript has been approved for publication in the African Journal of Health Sciences (AJHS).

Thank you for taking interest in AJHS.

Kind Regards,

Jane M Rintari (Miss), B.A (Hons) Degree in Sociology & Gov't (UON), MPSM (AU), Zimbabwe,
Principal Administrative Officer/Head of Administration (AJHS),
For: Editor-in-Chief, AJHS,
KENYA MEDICAL RESEARCH INSTITUTE (KEMRI).