KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY KUMASI, GHANA COLLEGE OF HEALTH SCIENCES SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF POPULATION, FAMILY AND REPRODUCTIVE HEALTH

FACTORS INFLUENCING CERVICAL CANCER PREVENTION AMONG HEALTH TRAINEES IN KUMASI, GHANA

BY

BLESS HAYFORD ADDO

JUNE, 2019

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KUMASI, GHANA**

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A THESIS SUBMITTED TO THE DEPARTMENT OF POPULATION, FAMILY AND REPRODUCTIVE HEALTH, COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN POPULATION AND REPRODUCTIVE HEALTH.

JUNE, 2019

DECLARATION

I hereby do declare that except for references to other people's work which have been duly acknowledged, this piece of work is my own composition and neither in whole nor in part has this work been presented for the award of a degree in this university or elsewhere.

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DEDICATION

I dedicate this thesis to my dear wife, Bernice for her support throughout this programme. To

my lovely dauhgters; Sharon Narkie and Evangelyn Narkour, and to my highly energetic

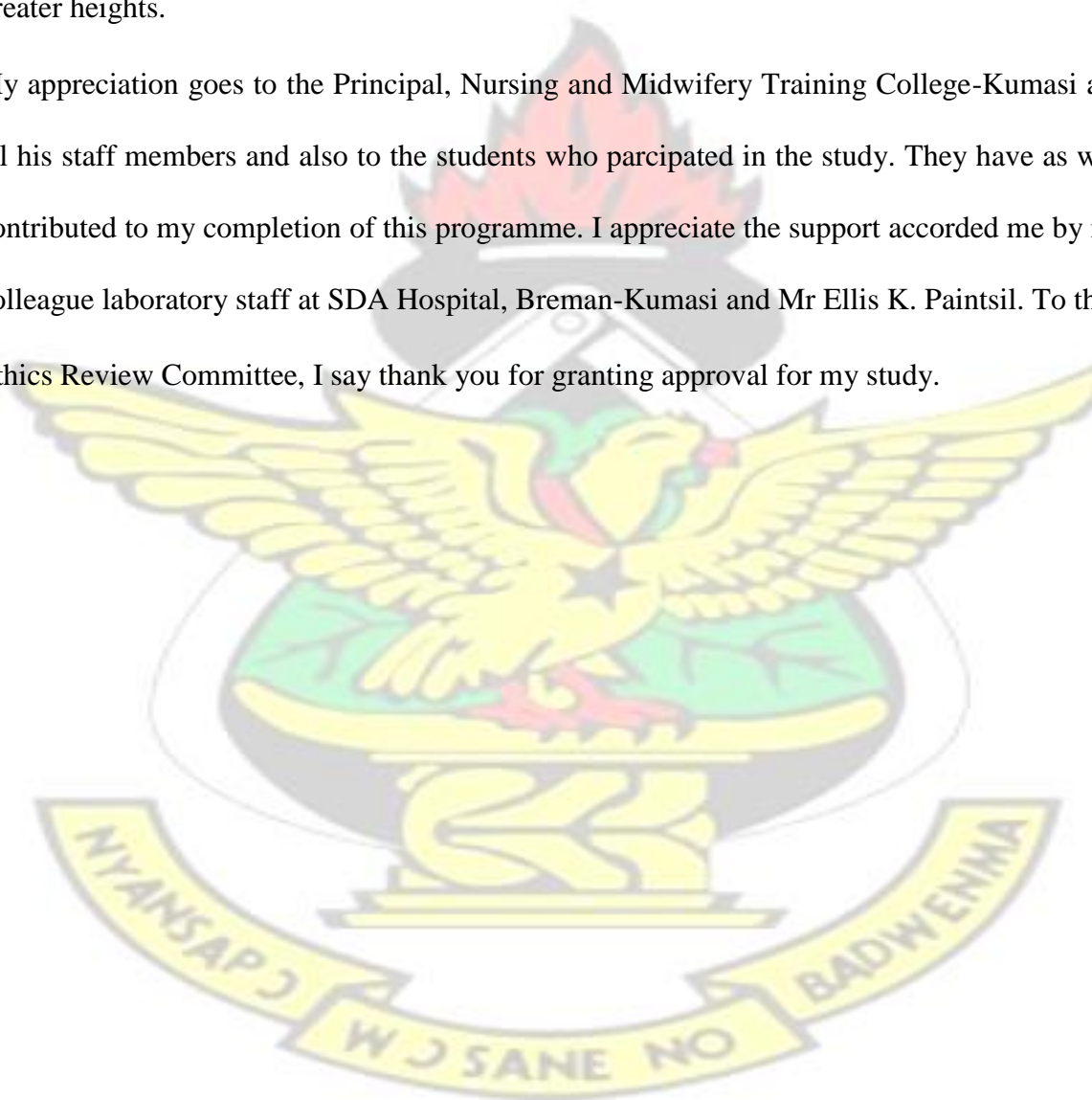son; Benedict, affectionately called Papa Kwesi.

ACKNOWLEDGEMENT

ABBREVIATIONS/ACRONYMS

ACOG	American College of Obstetrics and Gynaecology
AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
ASCO	American Society of Clinical Oncology
CC	Cervical Cancer
CDC	Centres for Disease Control and Prevention
COR	Crude Odds Ratio
DNA	Deoxyribonucleic acid
ENT	Ear, Nose and Throat
HIV	Human Immunodeficiency Virus
HPV	Human Papillomavirus
IARC	International Agency for Research on Cancer
ICO	*Institut Catalá d'Oncologia*
JHPIEGO	John Hopkins Programme for International Education in Gynaecology and Obstetrics
KATH	Komfo Anokye Teaching Hospital
KBTH	Korle-Bu Teaching Hospital
KNUST	Kwame Nkrumah University of Science and Technology
mRNA	Messenger Ribonucleic Acid
NCD	Non-communicable Disease
NHIS	Nation Health Insurance Scheme
Pap	Papanicolau

PDQ   Physician Data Query

SD   Standard Deviation

SDG   Sustainable Development Goal

SMS   School of Medical Sciences

TB   Tuberculosis

USA   United States of America

VIA   Visual Inspection with Acetic Acid

VILI   Visual Inspection with Lugol's Iodine

W H O   World Health Organization

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ABSTRACT Background

Cervical cancer is preventable by screening and vaccination, yet 740 women die daily from it. Globally, there are 569,847 new cases of cervical cancer with 311,365 deaths recorded annually. This study seeks to determine factors influencing cervical cancer prevention among trainee nurses and midwives in Kumasi.

Methods

A cross sectional study was conducted by administering a structured questionnaire to female trainee nurses and midwives of Kumasi Nursing and Midwifery Training College between August and November 2018. Descriptive and Inferential statistics were carried out using Stata Version 14.2 to determine if Knowledge about cervical cancer and HPV, sociodemographic factors had any influence on cervical cancer prevention. All statistical tests were performed using two-sided tests at 0.05 level of significance.

Result

Knowledge of cervical cancer was good as 87.3% scored ($\geq$13) on a 0-26 item scale but only 17.2% were able to state all the four listed symptoms of cervical cancer and fewer (4.2%) were able to select all the five listed risk factors of cervical cancer.

Out of the 341 students recruited, 13.2% had screened for cervical cancer and only 0.3 had vaccinated against HPV. Multivariable analysis found previous employment (P$\leq$0.04; AOR, 3.46, CI, 1.08-11.03) and area of residence (P$\leq$0.04; AOR, 2.25; CI, 1.03-4.94) were significant factors associated with screening for cervical cancer.

Conclusion

Good knowledge of cervical cancer did not translate to high proportion of screening and vaccination. Previous employment and area of residence were found to have influenced cervical cancer screening among students but none of the factors investigated was found to influence vaccination. Free national cervical cancer screening and vaccination programme should be a priority.

CHAPTER ONE

INTRODUCTION

1.0 **Introduction**

Cervical cancer is among the few preventable cancers known to man, yet globally, it remains a public health problem with high disease burden in developing nations including Ghana. Even though cervical cancer can be prevented, an estimated 527,600 new cases and 265,700 deaths occurred globally in 2012 (Torre *et al.*, 2015). The burden of cervical cancer deaths in developing countries was about 90% of the world cervical cancer situation in 2012, with a distribution as follows: 60,100 for Africa , 28,600 for Latin America and the Caribbean and 144,400 for Asia (Torre *et al.*, 2015). Research has shown that new cases of the disease could be reduced by about 80% when women undergo regular screening, treatment and follow up (Arbyn *et al.*, 2010).

1.1 Background information

The global incidence and mortality of cervical cancer as reported by the Global Cancer Incidence, Mortality and Prevalence (GLOBOCAN) are 569,847 and 311,365 (GLOBOCAN, 2018) respectively. West Africa, the region where Ghana belongs is third on the World Health Organization (WHO) regional league of cervical cancer incidence and mortality after Southern and Eastern Africa (WHO, 2018). The disease burden of cervical cancer poses public health concern especially in developing countries as it has emerged as the second most common cancer affecting women between ages 15 to 44 (Bailey *et al.*, 2016).

Globally, 740 women die daily from cervical cancer (Small *et al.*, 2017) and as such makes it the second most common cause of cancer death among women (Chabra, 2016). Cervical cancer was the fourth most common cancer among women globally, with an estimated incidence of 528,000 cases and 266,000 deaths in 2012 of which 85% occurred in less developed countries (GLOBOCAN, 2012). According to the American Cancer Society, 12,820 new cases of

cervical cancer were expected in 2017 with expected mortality of 4,210 in the United States of America (USA). In West Africa, new cases of cervical cancer estimate for 2012 were 27,326 and in Ghana new cases estimate for 2012 were 3,052 with 1,556 deaths (Bruni L *et al.*, 2017). Human papillomavirus is the most common viral infection of the reproductive tract which infect most sexually active women and men and is known to cause almost all cervical cancer with the type 16 and 18 causing about 70% of the disease (WHO, 2016).

There is a very strong evidence implicating certain types of Human Papillomavirus (HPV) as causative agent for almost all cases of cervical cancer (Bosch *et al.*, 2014) but HPV infection can be prevented through vaccination (Cervical Cancer Action, 2015). According to the WHO, primary prevention of cervical cancer starts with the HPV vaccination of girls age 9 – 13 years before they become sexually active. Though statistics about cervical cancer are striking, little has been done to promote prevention of the disease in Ghana as compared to diseases such as malaria, Tuberculosis (TB), Human Immunodeficiency Virus/Acquire Immunodeficiency Syndrome (HIV/AIDS) and even breast cancer in recent years. The Pap test and visual inspection with acetic acid (VIA) are the cervical cancer screening methods that are available in public and private hospitals throughout the country. Sometimes, public hospitals offer free cervical cancer screenings and occasionally, non-governmental organizations (NGOs) have conducted organized cervical cancer screening events in rural areas in Ghana (Williams and Amoateng, 2012). The World Health Survey data indicate that cervical cancer screening rates in urban and rural areas in Ghana are extremely low, 3.2% and 2.2% respectively. However, results of previous studies indicate that lack of knowledge about cervical cancer among Ghanaians may be a barrier to cervical cancer screening (Williams and

Amoateng, 2012). Several studies have shown that deficiency of knowledge about HPV might adversely affect vaccine uptake (Caskey *et al* 2009; Cates *et al*, 2012; Hilton and Smith, 2011). Many studies have focused on parental willingness to vaccinate their children

(Bair *et al*, 2008; Das *et at*, 2008; Lanselink *et al*, 2008; Ogilvie *et al*, 2007; Sperber *et al* 2008; Woodhall *et al*, 2007) whereas fewer studies have been carried out to evaluate the knowledge of HPV vaccine and attitude among young women (Crosby *et al*, 2007; D'Urso *et al*, 2007; Gerend *et al*, 2007; Gerend and Magloire, 2008). Some reviews (Bharadwaj *et al*, 2009; Brewer and Fazekas, 2007; Klug *et al*, 2008; Zimet *et al*, 2006) have established that acceptance of vaccine increases among people who are aware of the relationship between HPV and cervical cancer (Hussain *et al.*, 2014).

Many studies have suggested health care providers are pivotal to the control and management of cervical cancer (Balarabe *et al.*, 2014; Chabra, 2016 ; Dike and Ijeoma, 2017), but studies involving these health care providers show that increased level of awareness and knowledge among these people do not translate into increased utilization of screening (Ali *et al.*, 2010; Awodele *et al.*, 2011; Gebreegziabher, Asefa and Berhe, 2016). It is of note that female health care providers are core in awareness creation and the promotion of cervical cancer prevention through vaccination and screening (Anantharaman, 2013). According to Bailey *et al.*, (2016), health professionals are needed to ensure high increase in HPV vaccination uptake..

1.2 Problem statement

Cervical cancer is an important public health issue in Ghana (Nartey *et al.*, 2017) since WHO has predicted that by the year 2025 about 5,000 new cases of cervical cancer and 3,361 cervical cancer deaths will occur annually in Ghana (Williams and Amoateng, 2012). Data available indicates that cervical cancer is the most frequent cancer among women in Ghana and the leading cause of cancer mortality, especially those in their reproductive age.

Prevention of cervical cancer through screening and vaccination is key to minimizing the threat of the disease but these preventive services are underutilized, even among health workers (Ali *et al.*, 2010; Awodele *et al.*, 2011; Gebreegziabher, Asefa and Berhe, 2016).

In the Kumasi Metropolis, cervical cancer screening services are available at some public and private health facilities but yet screening is low among the various categories of women (Idowu *et al.*, 2016). Few studies have been conducted into cervical cancer screening, vaccination against HPV and the factors that influence cervical cancer prevention among health workers and very few or non among trainee nurses and midwives. It is for this reason that I aim to determine the factors that influence cervical cancer prevention among trainee nurses and midwives in Kumasi. In Ghana, available studies concerning cervical cancer have either discussed screening or vaccination but not both and this study intends to do so.

1.3 Rationale of study

Cervical cancer prevention is very crucial in the realization of the Sustainable Development Goal (SDG 3) of reducing pre-mature mortality from non-communicable diseases (NCDs) through prevention and treatment by one third by 2030. It has been suggested by Hill and Cox (2017) that improvement in preventive strategies could minimize the burden of cancer of the cervix in Ghana. It is hoped that this study will help to identify barriers to vaccination against HPV and screening for cervical cancer, propose recommendations to help overcome these barriers and help to promote the awareness and knowledge of cervical cancer prevention among trainee nurses and midwives. The findings of this study will provide valuable contribution to academia and opportunities for further study into the issue of

cervical cancer prevention among trainee nurses and midwives.

1.4 Conceptual framework
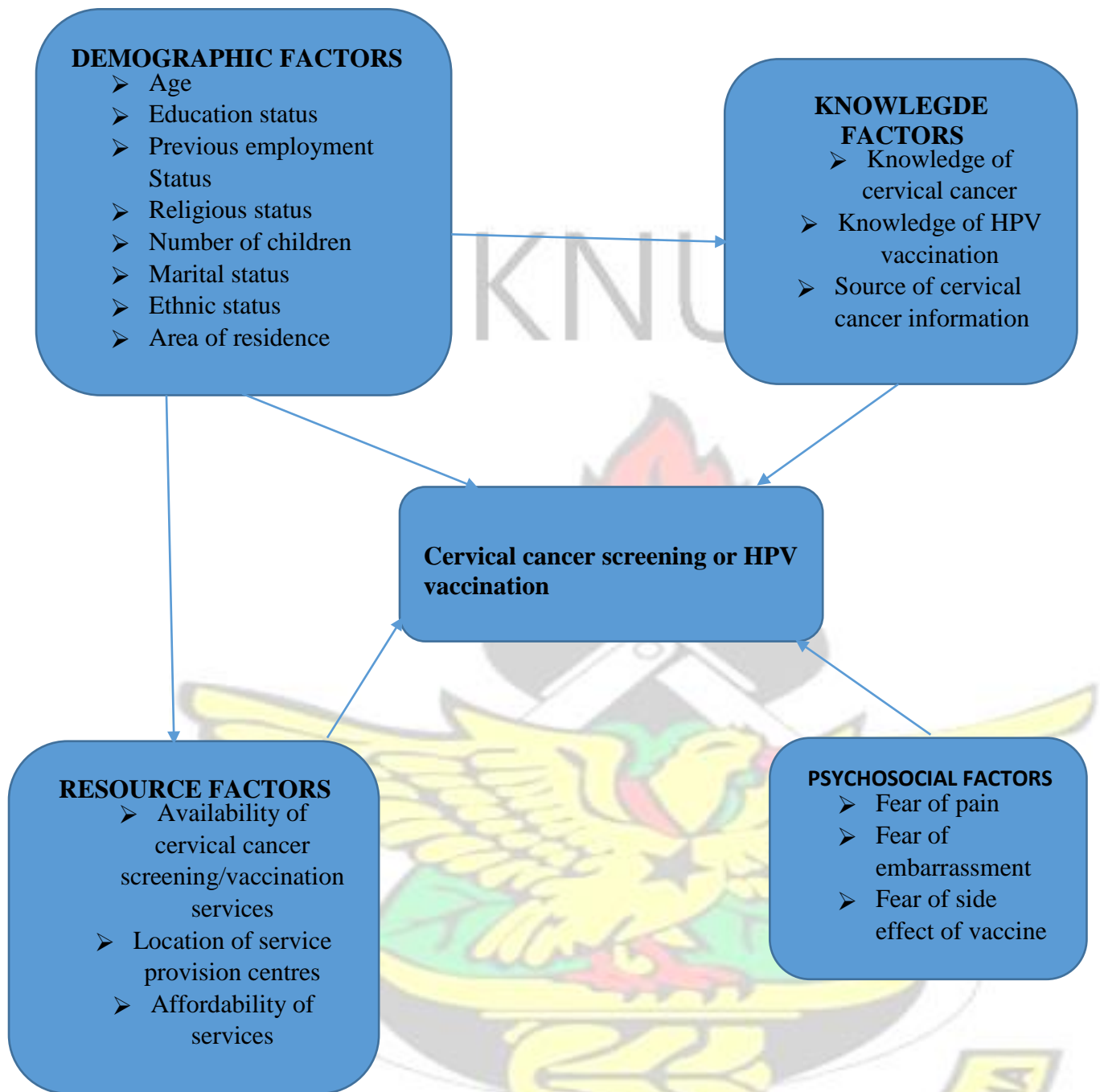
Figure 1.1: Conceptual Framework

Source: Author's construct, 2018

The conceptual framework in figure 1.1 explains how various factors interact and influence utilization of cervical cancer prevention. There is a direct interaction between sociodemographic factors and knowledge factors, socio-demographic factors and resource

factors while they all influence cervical cancer prevention. Psychosocial factors directly influence cervical cancer prevention as seen in figure 1.1.

Knowledge factors include heard of cervical cancer, know of symptoms of cervical cancer, know of risk factors of cervical cancer and know of any cervical cancer screening method. It again include have heard of HPV, know HPV is sexually transmitted and principal cause of cervical cancer, know of HPV vaccine and know as well that the vaccine can prevent cervical cancer. Resource factors as captured in the framework described availability of cervical cancer screening and vaccination services, the location of such prevention services and the cost of the service. Psychosocial factors include fear, pain, embarrassment and others.

1.5 Research questions

This study seeks to find answers to questions like

1.   What is the level of knowledge among trainee nurses and midwives on cervical cancer and its prevention methods?

2.   What proportion of trainee nurses and midwives have ever screened for cervical cancer or vaccinated against HPV?

3.   What factors affect cervical cancer screening and vaccination among trainee nurses and midwives?

1.6 General objective

To determine the factors influencing cervical cancer prevention among trainee nurses and midwives in Kumasi.

1.7 Specific objectives

1. To determine the knowledge of cervical cancer among trainee nurses and midwives.

2. To determine the proportion of trainee nurses and midwives who have undergone screening for cervical cancer.

3. To determine the proportion of trainee nurses and midwives who have been vaccinated against HPV.

4. To identify factors influencing vaccination against, and screening for cervical cancer among trainee nurses and midwives.

1.8 Scope of study

The scope of the study was limited to female students of Nursing and Midwifery Training School, Kumasi. Female students 20 years and above were the study participants because they qualify for screening and might have vaccinated. The study site was Nursing and Midwifery Training College, Kumasi because cervical cancer screening and vaccination against HPV services are available.

1.9 Organization of study

This work has been organized according to the graduate school thesis format and it is as follows: Chapter 1 has been organized into introduction, background information, problem statement, rationale of study, conceptual framework, research questions, general objective, specific objectives, profile of study area, scope of study and organization of report. Chapter 2 covers literature review which has been organized into overview of cervical cancer, the burden of cervical cancer, demographic characteristics and cervical cancer, prevention of cervical cancer, knowledge of cervical cancer, utilization of cervical cancer screening and vaccination services and factors influencing cervical cancer screening and vaccination. Chapter 3 has been organized into research methods, design, data collection technique, data collection tools, study population, study variables, sampling, data handling, data analysis, ethical consideration and assumptions. Chapter 4 presents results according to the key objectives and chapter 5 and 6 discuss findings and recommendation respectively.

2.0 Literature review

This chapter discusses relevant literature to the study and has been sectioned into overview of cervical cancer, the burden of cervical cancer, demographic characteristics and cervical cancer, prevention of cervical cancer, knowledge of cervical cancer, utilization of cervical cancer screening and vaccination services and factors influencing cervical cancer screening and vaccination.

2.1 Overview of cervical cancer

The burden of cervical cancer is still a public health problem globally because over 270,000 women die annually from the disease with about 85% of these deaths occurring among women living in low and middle income countries (WHO, 2018).

The Physician Data Query (PDQ) describes cervical cancer as abnormal cell growth on the cervix which is caused by HPV infection that is acquired via sexual intercourse. The abnormal cells grow slowly, advancing through precancerous changes and become invasive (PDQ, 2019). Centers for Disease Control and Prevention (CDC) stated cervical cancer as a gynaecological cancer can affect any woman (CDC, 2016), the precancerous changes in the cervix are detected in women between 20 and 30 years of age but women in their mid-50s form the majority of cervical cancer diagnosis (PDQ, 2019). The pre-cancer cells of cervical cancer last many years before they become invasive, this is the main reason why women from age 20 and above must cease the opportunity to screen for cervical cancer and get treated at the early stage of the disease (WHO, 2014). The signs and symptoms presented in cervical cancer take many years to show and often occur at the advanced stage of the disease. These are the signs and symptoms that appear in the advanced stage of the disease, irregular, intermenstrual or abnormal vaginal

bleeding after sexual intercourse; back, leg or pelvic pain; fatigue, weight loss, loss of appetite; vaginal discomfort or odourous discharge; and a single swollen leg (WHO, 2016).

The American College of Obstetrics and Gynaecology (ACOG) in their new guideline released in 2012 for cervical cancer screening with the Pap smear provided the various age ranges with respective recommendations. Among the ages with their recommendation are; there should be no screening below age 21 years, women between age 21 – 29 years should screen every 3 years, women between 30 – 65 years should screen every 3 years plus HPV testing every 5 years and women over 65 years should not screen if there has been adequate screening prior to age 65 years with no low risk for cervical cancer (Simon, 2017). The ACOG, again recommended that all females between age 9 – 26 years should receive the HPV vaccine so as to minimize their chance of getting cervical cancer (Simon, 2017).

2.2 The Burden of Cervical Cancer

The burden of cervical cancer among the less developed nations is nearly 85% of the global situation and estimated 87% mortality due to cervical cancer worldwide occur in developing countries (Basu *et al.*, 2017). Cancer related mortality is recorded most among women with cervical cancer in the developing countries which is 10 times what is registered in the developed countries (Agarwal, 2014). The global estimate of cervical cancer incidence was 529,000 in 2008 with an estimate of 275,000 deaths and 88% of these deaths occurring in developing countries. Among the 88% mortality in developing countries, 53,000 occur among women in Africa, 31,400 in Latin America and the Caribbean and 159,800 in Asia (Ferlay *et al.*, 2010). Chabra (2016) has indicated 134,420 cervical cancer diagnosis were made with 72,825 deaths among India women. An estimated 7 million disability adjusted life years in 2015 was attributed to cervical cancer of which majority occurred in developing countries (Basu *et al.*, 2017).

According to the Cervical Cancer Action Report Card April, 2015, over 443,000 deaths due to cervical cancer is expected by 2030 worldwide. Cervical cancer situation in sub-Sahara Africa is expected to double because 90% of the projected 474,000 deaths from cervical cancer by 2030 is expected among women in low and middle income countries (Cervical Cancer Action, 2015). There is enough evidence that the loss of wives, sisters, daughters, partners, mothers and friends can be avoided through available screening and vaccination services. The United States cervical cancer morbidity and mortality in 2016 were estimated 12,990 cases and 4,120 deaths respectively (Small *et al.*, 2017). In 2008, it was established that estimated 10,000 new cases of cervical cancer occur annually with about 8000 deaths among women in Nigeria (Airede *et al.*, 2008). Globocan in 2012 published estimated 5 years prevalence of 21.6% for cervical cancer among females in Nigeria. Airede et al (2008) in their paper titled "carcinoma of the uterine cervix in Nigerian woman: the need to adopt a national prevention strategy, cervical cancer mortality was projected to increase by 25% for the next 10 years. Kenya has almost half (51.2%) of the women population age 15 years and above being at risk of developing cervical cancer (Nzioka, Nyagetiria and Karanja, 2018).

In Ghana, 8.57 million women age 15 and above are at risk of developing cervical cancer (ICO/IARC HPV Information Centre, 2017) while in 2012 estimated new cases and deaths due to cervical cancer were 3,052 and 1,556 respectively (Nartey *et al.*, 2017). The crude incidence rates for cervical cancer from 2010-2013 in Greater Accra according to Hill and Cox (2017), was 14.5 per 100,000 person years and 9.1 per 100,000 person years for Ashanti regions of Ghana. The same study of Hill and Cox (2017), revealed 215 women died from cervical cancer according to the records of Korle Bu Teaching Hospital (KBTH) while there was 101 cervical cancer deaths from the records of Komfo Anokye Teaching Hospital (KATH) from 2010-2013. The study again found that the advanced stage of the disease was seen which implies low utilization of screening and follow ups.

2.3 Demographic Characteristics and Cervical Cancer

Several risk factors are associated with cervical cancer of which some are demographic, including high parity and low socioeconomic status (Ali *et al.*, 2010) and age (Chabra, 2016). Though awareness of cervical cancer was related to age, marital status, educational level and parity (Balarabe *et al.*, 2014), only age and education were significantly associated with increased uptake of screening (Hyacinth *et al.*, 2012; Singh and Badaya, 2012). Sociodemographic characteristics are known to influence health outcomes including cervical cancer prevention as shown by findings from a study in Nigeria which indicated that high level of education, age and parity were significantly associated with increased level of awareness as well as utilization of cervical cancer screening (Bakari, Takai and Bukar, 2015), marital status also influenced uptake among nurses (Awodele *et al.*, 2011), so as age, marital status, awareness and cervical cancer screening utilization have significant associations (Gebreegziabher, Asefa and Berhe, 2016). Age as well as parity influences screening in Iran (Nzioka, Nyagetiria and Karanja, 2018).

A study in Ghana showed that people with low to high level of education are likely to screen than people without formal education (Ebu, 2018). On the other hand, age, marital status, employment status, religion and ability to afford screening service did not influence cervical cancer screening uptake. Two teaching hospitals in Ghana, KBTH and KATH have reported high number of cervical cancer cases among traders and farmers (Nartey *et al.*, 2017). Kokuro (2017) reported that age, marital status, education and work status are associated with low utilization of cervical cancer screening among women attending health service in the Kumasi Metropolis.

2.4.0 Prevention of Cancer of the Cervix

WHO recommends a comprehensive approach to cervical cancer prevention and control that includes multi-disciplinary interventions across the life course. Community education, socialmobilization, vaccination, screening, treatment and palliative care are needed to improve cervical cancer control. Almost all of cervical cancer deaths could be avoided if known effective interventions were available to all women and implemented, including immunizing adolescent girls against HPV and cervical screening and treatment of pre-cancerous lesions (WHO, 2018). The prevention of cancer of the cervix can be promoted with the 3 types of disease prevention including primary prevention, secondary prevention and tertiary prevention. Primary prevention include HPV vaccination for girls 9 years to 13 years or up to 26 years of age, health education on the risk factors of cervical cancer and provision of condoms to those sexually active. Secondary prevention focuses on screening and treatment as needed, that includes screening through Pap test, VIA and HPV testing for high risk HPV types. Tertiary prevention deals with treating all women of invasive cervical cancer at any age including ablative surgery, radiotherapy and chemotherapy (WHO, 2013). HPV vaccination of girls as well as various screening methods available and their appropriate treatments are known to effectively prevent and reduce the cervical cancer situation (Bermudez, Bhatla and Leung, 2015).

2.4.1 Primary Prevention of Cervical Cancer

The most desirable practice for primary prevention of cervical cancer is through vaccination (Arrossi *et al.*, 2017). On the basis of global HPV genotype distribution, oncogenic HPV infections can be reduced to 90% with existing HPV vaccines (Arrossi *et al.*, 2017). Two vaccines have been licenced in most countries against the invasive types of HPV, these are the Gardasil and the Cervarix. They provide over 95% protection against the HPV types 16, 18, 61 and 11 but 70% of cervical cancers globally are caused by the HPV types 16 and 18.

The vaccines work best if received before exposure to HPV which WHO recommends ages 9 to 13 and 3 doses administered over 6 months (WHO, 2013). The vaccine can still provide protection for sexually active women up to age 26 years (Simon, 2017) since they may not have been exposed to all the cervical cancer causing HPV types. Arrossi *et al* (2017) recommend two-dose regimen for girls 9-14 years and a three-dose regimen for those above 14 years to 26 years.

There are evidence to the success of HPV vaccination and reduction in the incidence of highly invasive types of HPV among countries like Australia (Agarwal, 2014). There are other ways to prevent infection with HPV and they include safe sexual education, promotion and provision of condoms for those already engaged in sexual activity (WHO, 2018).

2.4.2 Secondary Prevention of Cervical Cancer

Basu *et al* (2017) defines secondary prevention as a population-based or individual-based intervention to detect the disease early and to treat the same to achieve a positive health outcome. According to Aggarwal (2014), secondary prevention of cervical cancer involves early detection of precancerous lesions with techniques such as cytology, VIA or visual inspection with lugol's iodine (VILI), HPV testing and biomarkers. Incidence and mortality of cervical cancer could be reduced to 80% or 90% among the developed nations but that could not be the situation in the developing countries (Basu *et al.*, 2017). Pap smear cytology has been the first and still widely used screening test for cervical cancer.

Anatomically, the cervix is accessible, can be easily visualized and makes sample collection for screening relatively simple and painless (Basu *et al.*, 2017). There are convincing proofs to the effectiveness of Pap smear test in reducing cervical cancer. VIA and VILI are simple, point-of care and inexpensive tests that can be used by clinicians as well as trained non clinicians to

detect changes with the naked eyes (Basu *et al.*, 2017). HPV detection technologies detects viral deoxyribonucleic acid (DNA) or messenger ribonucleic acid

(mRNA) of most cervical cancer causing HPV types. A clinical trial conducted among rural India showed that cervical cancer deaths among women who had a single round HPV testing decreased by 50% (Torre *et al.*, 2015). There are evidence that these secondary prevention methods are accepted by women in most countries without cultural hindrances (Basu *et al.*, 2017). The purpose of secondary prevention is to detect and treat disease so precancerous lesions identified are treated with options such as cryotherapy or loop electrosurgical excision procedure (Jeronimo *et al.*, 2017).

2.5 Knowledge of Cervical cancer

Ali *et al* (2010), attributed low utilization of preventive services for cervical cancer among women age 30-60 years to factors such as lack of awareness of health professionals about the screening test, poor availability, poor accessibility and poor quality of care providers. Knowledge about the cause of cervical cancer in the community is low as it is among health professionals (Ali *et al.*, 2010). Knowledge about the etiology of cervical cancer in the study conducted by Ali *et al* (2010) was 78%, awareness about screening test was 54% and only 9.4% were aware of the vaccine against HPV. The study established inadequate knowledge about cervical cancer and its prevention among health professionals. Majority of respondents in a study conducted in India by Aswathy *et al.*, (2012) indicated 92.8% had poor knowledge about symptoms, risk factors and screening test for cervical cancer. Knowledge of cervical cancer was related to screening uptake in Iran (Ashtarian, Mirzabeigi and Mahmoodi, 2017). In a study conducted in North India, only 18% of the participants had knowledge about HPV vaccine (Hussain *et al.*, 2014).

Anantharaman (2013), indicated 85% of the respondents had good knowledge about cervical cancer risk factors and symptoms, 92% believed it can be prevented, 58.9% had adequate knowledge about cervical cancer prevention and 95.3% were aware of screening procedure. Awareness of cervical cancer among HIV- infected women in Ethiopia was 71% with 57% of the respondents stating their source of information was health facility (Netsanet et at, 2016). A 2011 study carried in Nigeria among nurses in a teaching hospital showed 99% were aware of cervical cancer, 92% knew HPV causes cervical cancer and their major sources of information about cervical cancer were via electronic media (43.9%) and health professionals (37.4%).The result indicated 91% of the respondents were aware of Pap smear test as a screening test for cervical cancer (Awodele *et al.*, 2011). According to Abochie (2009), factors such as unavailability and inaccessibility of cervical cancer screening services contribute to the few numbers of women who have ever screened for cervical cancer in subSaharan Africa and other developing countries. According to Kokuro (2017), 75.1% women attending cervical cancer services in the Kumasi Metropolis had adequate knowledge of cervical cancer, similarly, Adageba *et al* (2011) reported high knowledge among health workers. Majority of respondents were not aware of Pap test and VIA as screening methods for cervical cancer as reported by Williams and Amoateng, (2012).

2.6 Utilization of Cervical Cancer Screening and Vaccination Services

The advanced stage of cervical cancer is fatal, has severe consequences which leads to physical, psychological and sexual problems (Abochie, 2009). Developed nations have 68% to 84% women using Pap smear (Aswathy *et al.*, 2012) whereas in developing countries, there are 2.0% to 20.2% screening coverage among women in the urban centres and 0.4% to 14.0% among rural dwellers (John, 2011).Uptake of screening among nurses varies widely across countries. For example, in Singapore screening coverage was 54.8% (Tay *et al.*, 2015),

19% in El Salvador (Alfaro *et al.*, 2015), 5% in India (Shah *et al.*, 2012) and 11.6% in Ghana (Adageba *et al.*, 2011). A study conducted by Aswathy *et al* (2012) in India revealed that only 56 (6.9%) of the 809 women in rural population had been screened for cervical cancer.

In sub-Saharan Africa and other developing countries, many research work have shown that very few women have ever screened for cancer of the cervix (Gebreegziabher, Asefa and Berhe, 2016). Cervical cancer screening practice among nurses in public health institutions in Mekelle, Ethiopia showed 10.7% had ever screened for cervical cancer (Gebreegziabher, Asefa and Berhe, 2016). Awodele *et al.* (2011) had 20.5% of the nurses taking up Pap smear while 12.5% used VIA. A study conducted by Kokuro (2017) among women attending health services in the Kumasi Metropolis of Ghana showed 18.7% had ever screened while 81.3 had never screened for cervical cancer. The work of Adanu *et al* (2010) showed that 2.1% had Pap smear done.

2.7 Factors Influencing Cervical Cancer Screening and Vaccination

Some factors identified by Aswathy *et al.*, (2012) as responsible for low screening included knowledge, lack of time, financial reasons and inaccessibility of services. They again identified psychosocial factors including lack of interest, fear of the procedure and embarrassment as factors affecting cervical cancer screening utilization. In Singapore, the reasons why nurses underwent screening were doctor's recommendation, husband's encouragement, people talking about screening and people close to the participant going for screening (Tay *et al.*, 2015). They also found that women between ages 35 to 49 years were favourite to take up cervical cancer screening because they had the financial assistance, were mostly employed, did easily accessed screening facility and were highly aware of screening. It has been identified in the US that among young adults aged 19 to 26, perceived barriers to HPV vaccination to include lack of knowledge, cost, concern about the safety of the vaccine, perceived low susceptibility to HPV, low intention to receive the vaccine and lack of provider recommendation (Kessler, 2017).

Lack of knowledge about cervical cancer has been shown to hinder utilization of service in Nigeria and Iran (Dike and Ijeoma, 2017 ; Ashtarian, Mirzabeigi and Mahmoodi, 2017). A study in Iran revealed embarrassment, fear from result and painful test as were barriers to Pap smear test in females (Ashtarian, Mirzabeigi and Mahmoodi, 2017). In Nigeria, attitude had significant relationship with increased uptake of cervical cancer screening (Gebreegziabher, Asefa and Berhe, 2016). Among nurses in a teaching hospital in Nigeria, factors such as marital status and awareness of cervical cancer contribute to increased uptake of Pap test (Awodele *et al.*, 2011), unavailable screening services and poor attitude of health workers (Dike and Ijeoma, 2017) and cost (Gebreegziabher, Asefa and Berhe, 2016) negatively affected uptake . Factors such as low awareness (35.5%) contributed to very low utilization of screening (8.3%) among female undergraduates (Ayinde, Omigbodun and Ilesanmi, 2004). Health professionals as well as health trainees are expected to take full advantage of the opportunities given through training and practice. They become aware of health related issues and advance in knowledge in health matters because often their course curriculum covers most of these issues. Awareness as well as knowledge about cervical cancer by health professionals and health trainees would be expected to influence their attitude and practice towards cervical cancer prevention but this is contrary to a study conducted in Nigeria (Dike and Ijeoma, 2017). The study declared there was no relationship between profession and uptake of cervical cancer screening, Knowledge about cervical cancer was high among the participants whereas utilization of screening was very low (Dike and Ijeoma, 2017). A study in North Central Nigeria among Federal civil servants, reported 10.2% utilized Pap smear test with lack of awareness and believe that cervical cancer is not prevented registered as barriers to screening (Hyacinth *et al.*, 2012).

The research work of Kokuro attributed low utilization of cervical cancer screening to fear that the procedure is painful and the service being expensive (Kokuro, 2017). Awareness creation as well as raising knowledge about cervical cancer will encourage risk reduction and early

diagnosis (Nartey *et al.*, 2017). A study carried out in Ghana revealed that formal education and high economic status increase utilization of cervical cancer screening but clinical visit for gynaecological consultation does not(Adanu *et al.*, 2010). Although cervical cancer screening services are available at selected facilities in the Kumasi Metropolis, uptake of screening is still low and factors such as; attitude, awareness of cervical cancer, awareness of cervical cancer screening (Idowu *et al.*, 2016), husband approval, embarrassment, pain, education, knowledge, preference of provider sex, awareness of centre, distance to centre (Lyimo and Beran, 2012) militate against utilization of the service. Kokuro (2017) reported that age, marital status, education and work status are associated with low utilization of cervical cancer screening among women attending health service in the Kumasi Metropolis. Another study conducted in Kumasi revealed fear, not knowing where to go for screening, cost and not having symptoms of cervical cancer as factors preventing participants from screening (Adageba *et al.*, 2011).

CHAPTER THREE

METHODS

3.0 Methods

This section describes the research methods, design, data collection technique, data collection tools, study population, study variables, sampling and data analysis.

3.1 Study design and type

A cross sectional study was conducted among health trainees between August and November, 2018 at the Nursing and Midwifery Training College in Kumasi. Female students 20 years and

above were given a self-administered structured questionnaire to complete within 30 minutes. The questionnaire administration time was arrived at during the pre-test.

3.2 Data Collection Techniques and Tools

A self-administered structured questionnaire was used to collect primary data from respondents.

3.3 Study Population

The study population comprised female trainee nurses and midwives who were at least 20 years old at the time of the data collection and were students of Nursing and Midwifery Training College, Kumasi.

3.4 Health Profile of Study Area

The Kumasi Nursing and Midwifery Training College was formerly called Kumasi Nurses' Training College. The college was founded by medical mission sisters of the Catholic Church in Kumasi in 1957 but now a public tertiary health institution in Kumasi, Ashanti Region. The college is located at the premises of the Komfo Anokye Teaching Hospital. Currently, the college offers two basic diploma programmes, Nursing and Midwifery plus a post-basic midwifery for practicing officers. The basic programmes run for three years whereas postbasic programmes are two years. The college shares some infrastructure facilities with other training institutions like the Ear, Nose and Throat Nursing School. The student population is made up of ladies and gentlemen in their late teens and above and from any part of the globe. Health needs of trainees are not different from that of the community where the college is situated. Primary healthcare as well as specialist healthcare needs of the students are catered for by the Polyclinic and Specialists' Directorates of Komfo Anokye Teaching Hospital respectively.

Komfo Anokye Teaching Hospital is the second largest hospital in Ghana, serving as a major referral centre as well as teaching hospital for Kwame Nkrumah University of Science and

Technology-School of Medical Sciences (KNUST-SMS). This tertiary health institution provides numerous health services to the people of Kumasi and its environs as well as a major referral centre for people in the middle and northern part of Ghana. There are many specialist units which help to facilitate teaching and learning for different categories of heath trainees. Health trainees at KATH are much exposed to wide range of healthcare services than their counterpart trainees in other health training institutions. Among such important healthcare services is cervical cancer screening.

Cervical cancer screening at KATH commenced May 2004 by JHPIEGO (John Hopkins Programme for International Education in Gynaecology and Obstetrics) where VIA method was used together with the traditional Pap smear test. It cost about $18 to undergo Pap smear test and about $3 to do VIA at KATH (Adageba *et al.*, 2011).

3.5 Inclusion criteria

    i. All female trainee nurses and midwives.

    ii. Female trainees who were at least 20 years old at the time of data collection.

    iii.   Female trainees who consented to participate in the study by signing the consent form.

3.6 Exclusion criteria

    i. All female trainee nurses and midwives who were below 20 years at the time of data collection. ii. All male trainee nurses.

    iii. Female trainees who declined consent to the study.

3.7 Study Variables

Study variables were; Dependent variables: cervical cancer screening and vaccination against HPV. Independent variables: socio-demographic factors (age, previous employment status, ethnic status, number of children, marital status, religion, place of residence), knowledge of cervical cancer, resource factors and psychosocial factors.

Objective	Variable	Indicators	Measuring Scale	Tools of Analysis
To determine the knowledge of cervical cancer among trainee nurses and midwives.	Knowledge of cancer of the cervix	a. Risk factors of cancer of the cervix b. Symptoms of cancer of the cervix c. Screening methods known d. Know of HPV vaccination e. Know HPV is sexually transmitted f. Know HPV vaccine can prevent cervical cancer	Nominal	Frequencies, percentage
To determine the proportion of students who have undergone screening for cervical cancer	Proportion of students who had ever been screened for cervical cancer	Percentage screened for cervical cancer	Ratio	Pie chart

To determine the proportion of students who had ever been vaccinated against HPV	Proportion of students who had ever been vaccinated against HPV	Percentage vaccinated against HPV	Ratio	Pie chart
To identify factors influencing vaccination against HPV and cervical cancer screening among trainee nurses and midwives	Sociodemographic factors of nursing and midwifery students	Marital status, programme of study, previous employment status, ethnicity, religion, area of resident	Nominal	Frequencies, percentage
		Age, number of children	Interval	Frequencies, percentage, mean
	Knowledge of cancer of the cervix	Knowledge score on 0-26 item scale	Ratio	Frequencies, percentage, mean

Table 3.1: Operationalization of key study variables

Source: Author's construct

3.8 Sample size estimation

Epi Info version 7.2.2.6 (CDC, Georgia, USA) was used to calculate the sample size for the

study using the following assumptions: 95% two sided confidence interval, 80% power, 4.8%

outcome in unexposed group (poor attitude) and 14.1% outcome in exposed group (good attitude) for the variable 'Attitude'(Gebreegziabher, Asefa and Berhe, 2016).

The sample size for the strata was computed as follows:

Proportionate sampling = (Sample size/Total population) x Number of students, i.e.

Proportionate sampling = (350/700) x Number of students

Table 3.2: Estimation of sample size

Programme of study	Number of students (% of total sample size)	Proportionate stratification
Direct Nursing	105 (30.0)	0.5 x 210
Direct Midwifery	87 (24.9)	0.5 x 175
Post Basic Nursing	95 (27.1)	0.5 x 190
Post Basic Midwifery	63 (18.0)	0.5 x 125
TOTAL	350	

3.9 Sampling technique

Multi Stage sampling was used to recruit 350 students. Nursing and Midwifery Training College, Kumasi was randomly picked among the three Nursing and Midwifery Training Colleges in Kumasi. The programmes of study were stratified into Direct Nursing, Direct Midwifery, Post Basic Nursing and Post Basic Midwifery programmes where proportionate sampling was calculated for each strata as indicated in the sample size estimation above. The list of students for each programme was used to develop a sampling frame for each strata by the researcher with the help of the various programme prefects. A systematic random sampling

was used to select participants from each strata. A 1-in-2 systematic sample was performed on each strata, for Direct Nursing the 1st student on the sampling frame was first selected, followed by the 3rd, 5th, 7th, 9th and any other odd number up to the 209th student. For Post Basic Midwifery, the 1st student on the sampling frame was first selected, followed by the 3rd, 5th, 7th, 9th and any other odd number up to the 125th student. For Direct Midwifery, the 2nd student on the sampling frame was first selected, followed by the 4th, 6th, 8th and any other even number up to the 174th student. For Post Basic Nursing, the 2nd student on the sampling frame was first selected, followed by the 4th, 6th, 8th and any other even number up to the 190th student. All selected students for each strata were gathered in a hall and given questionnaires to administer at the same time.

3.10 Pre-testing

The questionnaire was given to 2 experienced midwives and obstetrician & gynaecologist consultant to review and pre-testing was done at Offinso Nursing and Midwifery Training College among 35 female students 20 years and above. This was done to evaluate the reliability of the questionnaire, the average time needed to complete a questionnaire, sequence of questions and clarity of questions.

3.11 Data Handling

The data collected was validated, cleaned and checked for completeness. The data was entered through online Google doc form to generate a spreadsheet. The data was coded and imported to Stata Version 14.2 (StataCorp, College Station, Texas, USA) for analysis.

3.12 Data Analysis

The data was analysed using Stata version 14.2 (StataCorp, College Station, Texas, USA) the analysed results of participants' demographic factors, independent and outcome variables were summarized using descriptive summary measures expressed as mean (standard deviation) for continuous variables and frequency with percentage for categorical variables. The Chi-squared

test was used to measure the association between categorical variables and logistic regression was used predict the odds of preventing cervical cancer based on the values of the explanatory variables. All statistical tests were performed using two-sided tests at 0.05 level of significance.

Ten questions were asked regarding knowledge of cervical cancer while 7 questions were asked regarding knowledge of HPV among respondents. A 0-19 item scale was used to determine the knowledge of cervical cancer likewise a $0 - 7$ item scale was used to determine the knowledge of HPV. In order to establish the overall knowledge of cervical cancer, a 0-26 item scale was used to ascertain the overall knowledge of cervical cancer among respondents. Knowledge of cervical cancer was categorized into poor (<9.5) and good (≥9.5) and knowledge of HPV was categorized into poor (<3.5) and good (≥3.5). Overall knowledge of cervical cancer was categorized into poor (<13) and good (≥13).

3.13 Ethical Consideration

Approval for conducting this study was sought from the Committee on Human Research, Publication and Ethics of the Kwame Nkrumah University of Science and Technology. There was detailed explanation of the aim of this study to the participants, they were given time to ask question(s) for clarification and to decide whether or not to participate in the study. This ensured autonomy and the respondents who agreed to participate were given a consent form to administer. Anonymity of the data was ensured because there was no name or identity tagged to a name on the questionnaire.

3.14 Assumptions

It was assumed that respondents understood the questions and responded truthfully, and that the responses provided were accurate.

CHAPTER FOUR

RESULT

4.0 Result

This chapter summarises the key findings of the study in relation to the objectives of the study. The quantitative findings have been presented with tables and charts. A total of 341(97.4%) out of the 350 participants who were administered the questionnaire were included in the analysis, 9 people declined for various reasons.

4.1 Socio-demographic characteristics of respondents

The socio-demographic characteristics are shown in Table 4.1. The mean age of the students was 27.7 years with standard deviation (SD) of 6.5 and range 20-50. More than half 198 (58.1%) of the respondents were nursing students, 168 (49.4%) were single and 122 (35.9%) were married. Majority of the students 225 (66.4%) were working before school admission while 114 (33.6) had not worked before. Christians were 328 (96.5%) and urban dwellers were 269 (78.9%) with 72 (21.1%) resident in rural areas, more than half of the respondents 205 (60.5%) had no child. The dominant ethnic group among participants was Akan 266 (78%), which was followed by Ewe 31 (9.1%) and Ga-Adangbe 16 (4.7%).

Table 4.1: Socio-demographic characteristics of respondents

Variable	
Age (n=313)	Frequency (%)
20 – 29	191 (61.0)
30 – 39	99 (31.9)
40+	23 (7.1)
Programme of Study (n=341)	
Nursing	198 (58.1)
Midwifery	143 (41.9)
Marital Status (n=340)	
Single	168 (49.4)

Married	122 (35.9)
Divorced/separated/widowed	50 (14.7)
Ethnic group (n=341)	
Akan	266 (78.0)
Ewe	31 (9.1)
Ga-Adangbe	23 (6.7)
Grusi/Gurma/Mole Dagbani	8 (2.4)
Others	13 (3.8)
Religion (n=340)	
Christianity	328 (96.5)
Islam	12 (3.5)
Previous Employment Status (n=339)	
Was working before school admission	225 (66.4)
Was not working before school admission	114 (33.6)
Number of Children (n=339)	
0	208 (60.5)
1	48 (14.1)
2-4	86 (25.4)
Area of Resident (n=341)	
Urban	269 (78.9)
Rural	72 (21.1)

Source: Field data, 2018

4.2 Knowledge of cervical cancer and HPV among respondents

From table 4.2, almost all the respondents 336 (99.4%) knew who could get cervical cancer. There were 771 responses for symptoms of cervical cancer as multiple responses were allowed. A little over a third 277 (35.9%) of the respondents suggested abnormal vaginal bleeding is a symptom of cervical cancer while 28.8% and 22.2% respectively suggested bleeding after intercourse and abnormal vaginal discharge were also symptoms of cervical cancer. About a fifth (17.2%) of the students were able to select all the four symptoms of cervical cancer presented in the questionnaire. Risk factors of cervical cancer reported were; 33.7% for multiple sexual partners, 27.0% for early age at first sexual intercourse and 20.6% for

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prolonged use of oral contraceptives. Only 4.2% of the students could identify all the five risk factors of cervical cancer as contained in the questionnaire. There were 77.4% students who knew of Pap smear as a cervical cancer screening method. The average score for knowledge on cervical cancer was 11.7 (SD=2.8).

Table 4.2: Knowledge of cervical cancer among respondents

Variable		Variable	
Heard of cervical cancer (n=339)	**Frequency (%)**	**Regular screening reduces risk of cervical cancer (n=334)**	**Frequency (%)**
Yes	334 (98.5)	Yes	297 (88.9)
No	5 (1.5)	No	22 (6.6)
Who can get cervical cancer (n=338)		Don't know	15 (4.5)
Women	336 (99.4)	**Cervical cancer treatment is available in hospital (n=329)**	
Men and Women	1 (0.3)	Yes	272 (82.7)
Don't know	1 (0.3)	No	34 (10.3)
Symptoms of cervical cancer (responses=771)		Don't know	23 (7.0)
Abnormal vaginal discharge	171 (22.2)	**Cervical cancer is preventable (n=332)**	
Abnormal vaginal bleeding	277 (35.9)	Yes	305 (91.9)
Bleeding after intercourse	222 (28.8)	No	18 (5.4)
Bleeding after menopause	96 (12.5)	Don't know	9 (2.7)
Don't know	5 (0.7)		
Risk factors for acquiring cervical cancer (responses=811)		**Cervical cancer screening method known (responses=398)**	
Early age at first sexual intercourse	219 (27.0)	Pap smear test	308 (77.4)
Multiple sexual partners	273 (33.7)	Visual Inspection with Acetic acid	58 (14.6)
Prolonged use of oral contraceptives	167 (20.6)	Visual Inspection with Lugol's Iodine	18 (4.5)
HIV infection	63 (7.8)	Don't know of any method	14 (3.5)
Smoking	80 (9.9)		
Don't know	16 (1.1)		

Recommended age for cervical cancer screening in Ghana (n=329)		Know of cervical cancer screening method (n=334)	
21	198 (60.2)	Yes	276 (82.6)
25	48 (14.6)	No	58 (17.4)
31	10 (3.0)	**Knowledge of cervical cancer (n=339)**	
>35	25 (7.6)	Poor (<9.5)	70 (20.6)
Don't know	48 (14.6)	Good (≥9.5)	269 (79.4)

Source: Field data, 2018

In table 4.3 below, students who have heard of HPV were 97.3% while 90.6% knew HPV is sexually transmitted. About half (59.2%) of the participants knew about HPV vaccine and a little over quarter (31.3%) didn't know HPV vaccine prevents cervical cancer. The overall knowledge score ranged from 2 to 24. The average scores for knowledge of HPV and vaccination was 5.0 (SD=1.7) and overall knowledge was 11.3 (SD=4.3). Most (87.3%) of the respondents had good knowledge while few 42 (12.7%) had poor knowledge.

Table 4.3: Knowledge of HPV among respondents

Variable	Frequency %
Heard of HPV (n=340)	
Yes	331 (97.3)
No	9 (2.7)
How is HPV acquired (n=331)	
Air borne	1 (0.3)
Close contact	4 (1.2)
Don't know	26 (7.9)
Sexually transmitted	300 (90.6)
Know of relationship between HPV and cervical cancer (n=333)	
Yes	256 (76.9)
No	77 (23.1)
Relationship between HPV & cervical cancer (n=332)	
HPV causes cervical cancer	225 (67.8)
Don't know	107 (32.2)
Know about HPV vaccine (n=336)	
Yes	199 (59.2)
No	137 (40.8)
HPV vaccine prevents cervical cancer (n=332)	
Yes	209 (63.0)

No	19 (5.7)
Don't know	104 (31.3)
Age range (years) for HPV vaccination (n=281)	
9 – 13	34 (12.0)
9 – 26	119 (42.4)
Above 26	128 (45.6)
Knowledge of HPV (n=332)	
Poor (<3.5)	62 (18.7)
Good (≥3.5)	270 (81.3)
Overall knowledge (n=330)	
Poor (<13)	42 (12.7)
Good (≥13)	288 (87.3)

Source: Field data, 2018

The sources of information on cervical cancer are summarised in Fig 4.1 below. The most common sources of information were; health workers (43.1%), reading (24.8%) and the media (19.8%).
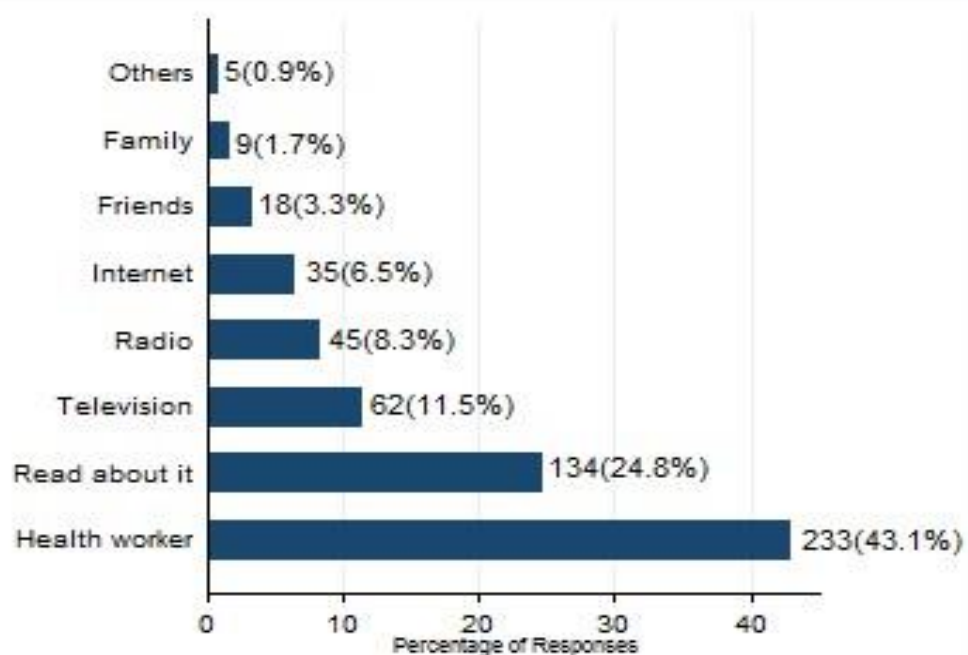
Figure 4.1: Responses for source of information about cervical cancer

Source: Field data, 2018

4.3 Proportion of respondents ever screened for cervical cancer

Figure 4.2 shows proportion of respondents who had ever been screened for cervical cancer of which 45 (13.2%) had screened for cervical cancer and 295 (86.8%) had not. Majority (67.4%) of those who had been screened used the Pap smear test for screening while very few respondents use a combination of pap test and others such as the VIA or VILI. Forty students (88.9%) had done it within the last 5 years and more than half (63.0%) of them indicated they frequently screen within 3 years as the guideline for cervical cancer screening stipulate for women above age 20.

Figure 4.2: Have ever screened for cervical cancer
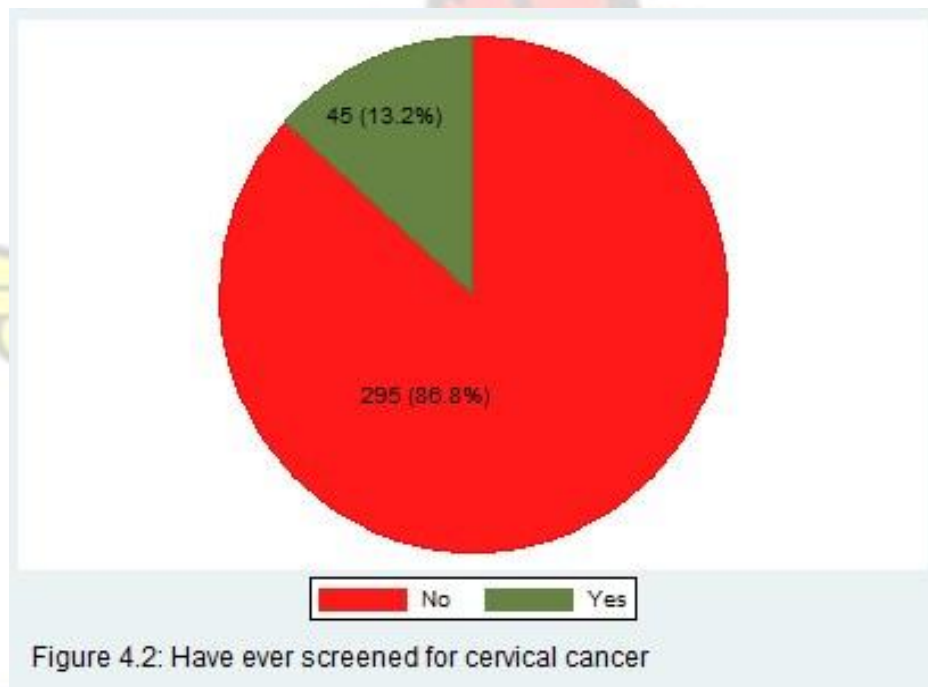
Source: Field data, 2018

Figure 4.3 below shows almost a third (36.2%) of the reasons why respondents screened for cervical cancer was because cervical cancer can be cured if detected early, 20.2% stated cervical cancer kills and they did not want to die from it and 8.5% said they could afford the cost of screening.
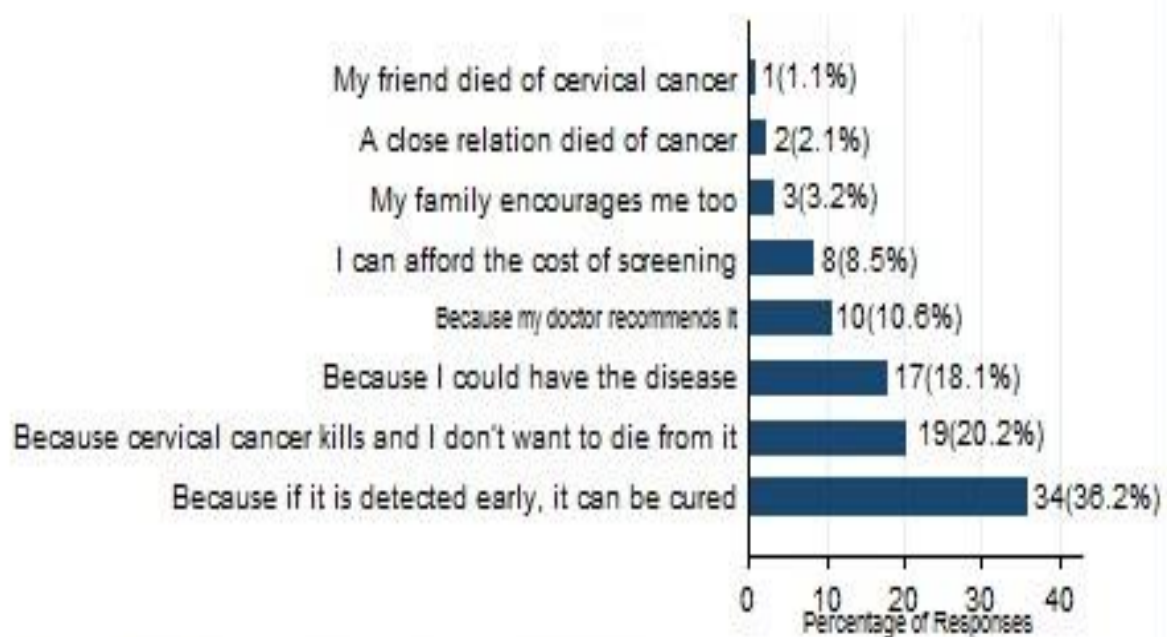
Figure 4.3: Responses for why respondents have screened for cervical cancer

Source: Field data, 2018

4.4 Proportion of respondents who had ever been vaccinated against HPV

Fig 4.4 shows proportion of respondents who had vaccinated against HPV, only one person had ever been vaccinated. The only person who was vaccinated did it after age 13, she vaccinated 3 times with Gandasil and the reason why she vaccinated was because the vaccine can help prevent cervical cancer.

Figure 4.4: Have ever vaccinated against HPV
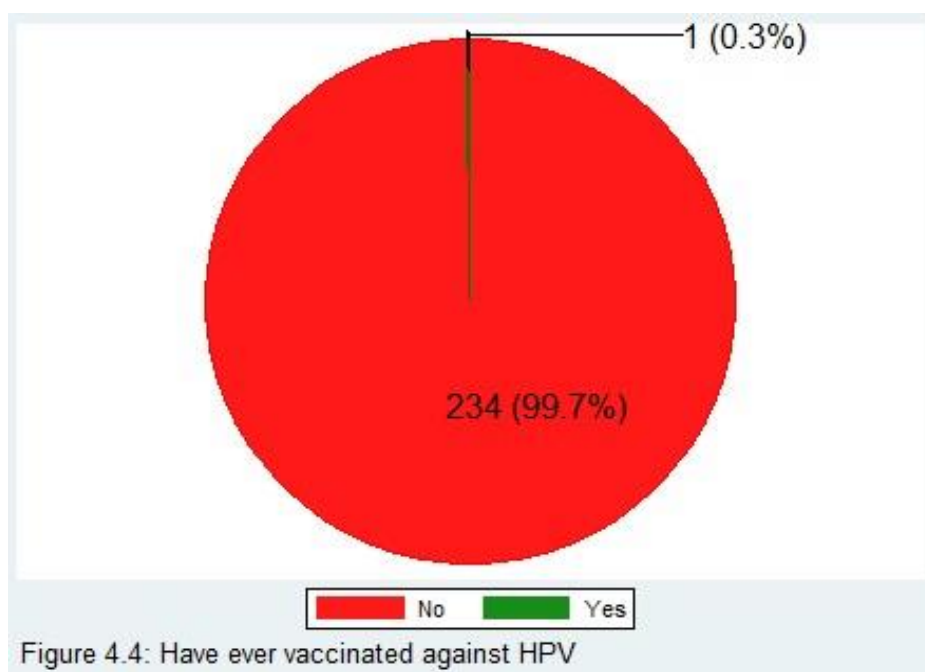
Source: Field data, 2018

4.4 Factors influencing cervical cancer vaccination and screening among trainee nurses and midwives

Table 4.4 shows almost all independent variables of knowledge factors were not statistically significant except those who knew of cervical cancer screening method (p≤0.04).

Table 4.4: Association between knowledge of cervical cancer and ever screened for cervical cancer

Variable	Ever Screened for Cervical Cancer n (%)	Pearson chi2	pvalue
Heard of cervical cancer (n=338)	Yes	**0.2**	**0.5**
Yes	43(97.7)		
No	1(2.3)		
Who can get cervical cancer (n=337)		**0.3**	**0.9**
Women	45(100)		
Men and Women	0		
Don't know	0		
Symptoms of cervical cancer (n=339)		**5.7**	**0.2**
One Symptom Known	11(24.4)		
Two Symptoms Known	12(26.7)		

Three Symptoms Known	17(37.8)		
Four Symptoms Known	5(11.1)		
Don't Know	0		
Risk factors for acquiring cervical cancer (n=340)		**3.3**	**0.6**
One Risk Factor Known	11(24.4)		
Two Risk Factors Known	9(20.0)		
Three Risk Factors Known	13(28.9)		
Four Risk Factors Known	6(13.3)		
Five Risk Factors Known	4(8.9)		
Don't Know	2(4.4)		
Know of cervical cancer screening method (n=333)		**4.2**	**0.04***
Yes	42(93.3)		
No	3(6.7)		
Regular screening reduces risk of cervical cancer (n=333)		**1.0**	**0.6**
Yes	40(88.9)		
No	4(8.9)		
Don't know	1(2.2)		
Cervical cancer treatment available in hospital (n=328)		**0.5**	**0.8**
Yes	37(84.1)		
No	5(11.4)		
Don't know	2(4.5)		
Cervical cancer is preventable (n=331)		**1.6**	**0.5**
Yes	41(93.2)		
No	3(6.8)		
Don't know	0		
Cervical cancer screening method known (n=340)		**7.1**	**0.1**
One Method Known	32(71.1)		
Two Methods Known	12(26.7)		
Three Methods Known	0		
Don't Know	1(2.2)		

*Statistically significant at P<0.05.

Table 4.5 shows univariable and multivariable logistic regression for socio-demographic factors and overall knowledge of cervical cancer as independent variables and screening for cervical cancer as the dependent variable. Univariable analysis revealed overall knowledge of cervical cancer did not influence cervical cancer screening (P<0.9) but age (P<0.004), programme of study (P<0.02), previous employment (P<0.003), number of children (P<0.02) and area of residence (P<0.006) were found to have influenced cervical cancer screening. Multivariable analysis showed there was significant association between previous employment (AOR, 3.46; 95% CI, 1.08-11.03) and screening for cervical cancer. Students who were

working before school admission were 3.46 times likely to screen for cervical cancer than their colleagues who were not working. Also, there was significant association between area of residence (AOR, 2.25; 95% CI, 1.03-4.94) and screening for cervical cancer. Students from the rural areas were 2.25 times likely to screen for cervical cancer than those in the towns and cities. There was no relationship between the explanatory variables and the response variable, have ever been vaccinated against HPV.

Table 4.5: Factors influencing Cervical Cancer Screening among students: univariable and multivariable analysis

Variable	Ever Screened for Cervical Cancer n (%)	COR (95% CI)	PValue	AOR (95%CI)	PValue
Age (n=312)	**Yes**		**0.004***		0.6
20 – 29	17 (8.9)	Ref		Ref	
30 – 39	15 (15.3)	1.85(0.88-3.88)		0.89(0.28-2.87)	
40+	7 (30.4)	4.48(1.62-12.4)		1.58(0.32-7.67)	
Programme of Study (n=340)			**0.02***		0.3
Nursing	19 (9.6)	ref		ref	
Midwifery	26 (18.2)	2.08(1.10-3.93)		1.51(0.72-3.15)	
Previous Employment Status (n=338)			**0.003***		**0.04***
Was working before school admission	39 (17.4)	3.74(1.56-9.26)		3.46(1.08-11.03)	
Was not working before school admission	6 (5.3)	Ref		Ref	
Number of Children (n=338)			**0.02***		0.8
0	19 (9.3)	Ref		Ref	
1	10 (20.8)	2.57(1.11		2.09(0.66-6.66)	
2-4	16 (18.8)	-5.98) -4.66) 2.27(1.10		1.45(0.38-5.62)	
Area of Residence (n=340)			**0.006***		**0.04***

Urban	28 (10.4)	ref			
Rural	17 (23.6)	2.65(1.36-5.18)		2.25(1.03-4.94)	
Overall Knowledge (n=)			P		0.7
<13	5 (12.2)	Ref 1.06(0.39-2.88)		Ref	
≥13	37 (12.8)			1.02(0.93-1.12)	

*Statistically significant at P<0.05; CI-Confidence Interval; COR-Crude Odds Ratio; AORAdjusted Odds Ratio.

Source: Field data, 2018

Figure 4.5 shows 22.7% of the students have not yet screened because cervical cancer screening is expensive, 18.1% indicated they didn't know of any screening centre and 7.3% stated they were not aware of any screening test.
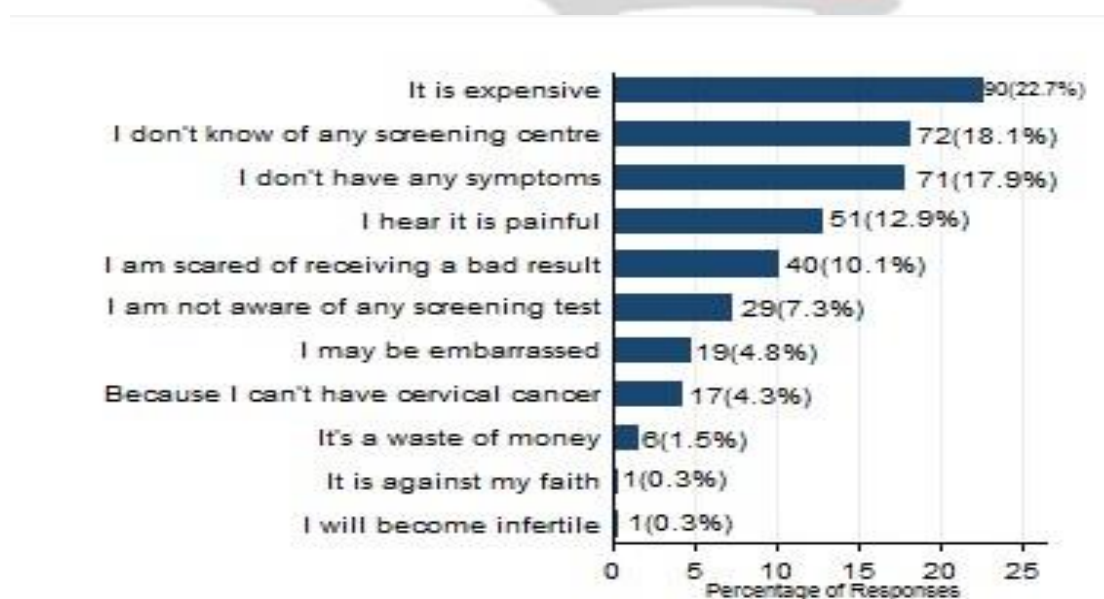
Figure 4.5: Responses for why respondents have not screened for cervical cancer

Source: Field data, 2018

Figure 4.4 shows only one student had vaccinated against HPV and figure 4.6 below shows the rest of the students stated the following reasons for having not yet vaccinated against HPV: 29.7% responded that they didn't know where to go for the vaccination, 28.3% didn't know there is a vaccine against HPV and 20.1% responded that the vaccine is expensive.
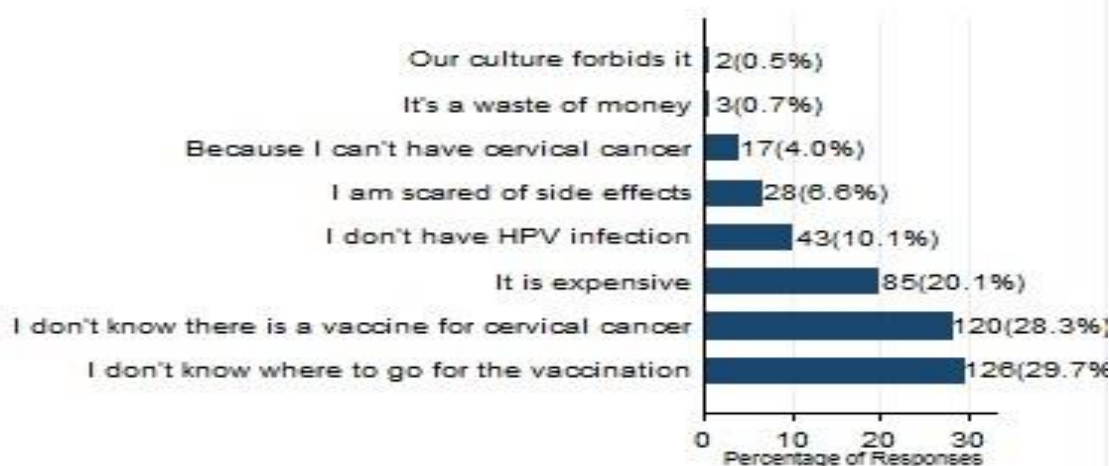
Figure 4.6: Responses for why respondents have not vaccicinated against HPV

Source: Field data, 2018

CHAPTER FIVE

DISCUSSION

5.0 Discussion

This chapter discusses the results of the study in relation to other published literature on the subject. It has been divided into various sub-sections: Knowledge of cervical cancer and HPV; Proportion of respondents ever screened for cervical cancer; Proportion of respondents ever vaccinated against HPV; and factors affecting cervical cancer vaccination and screening among health trainees.

5.1 Knowledge of cervical cancer and HPV among respondents

The overall knowledge of study participants about cervical cancer and its prevention was good as 87.3% of the respondents have heard about HPV, cervical cancer, and knew about symptoms

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and risk factors of cervical cancer as well as how it can be prevented. Other findings are in agreement with the findings of this study, Kokuro (2017) revealed that 75.1% of women attending cervical cancer services in Kumasi Metropolis had adequate knowledge of cervical cancer. Oche *et al.* (2013) also observed that 98.6% of respondents had good knowledge (≥50%) about cervical cancer and its related risk factors. Contrary to the current findings, Idowu *et al.* (2016) and Lyimo & Beran (2012) recorded 92.0% and 59.6% respectively of their study participants demonstrated poor knowledge on cancer of the cervix. The disagreement on knowledge of cervical cancer could be attributed to differences in educational status. According to Oche *et al.* (2013) 98.6% of female health workers in Sokoto, Nigeria had ever heard of cervical cancer and this concurs with 98.5% of respondents in this study who have heard of cervical cancer.

In this study, 97.3% of respondents have heard of HPV but this is inconsistent with 11.6% shown among Rural Southeast Asian women (Wong, 2011). The inconsistency could be due to differences in educational status and area of residence. Over three-quarters of the respondents knew of at least one screening method which is similar to 76.4% reported among female nurses in Ethiopia (Gebreegziabher, Asefa and Berhe, 2016). It was shown by this study that 67.8% of the respondents knew HPV causes cervical cancer and this is consistent with other findings which showed 87.7% (Oche *et al.,* 2013), 64.7% (Geneti, Hailu and Geremew, 2016), 52.8% (Fadhilah *et al.,* 2016) and 50.0% (Donadiki *et al.,* 2013) of the respondents knew HPV causes cervical cancer. As indicated in table 4.2, 59.2% of the respondents knew about HPV vaccine which agrees with 50.8% in a study conducted by Fadhilah *et al.* (2016) and 67.0% in a study by Donadiki *et al.* (2013) but disagrees with a study conducted in North India and reported by Hussain *et al* (2014) where 82 % and 88%

(Buadu, 2016) of the respondents had no idea about HPV vaccine. As low as 7.8% Rural Southeast Asian women knew about HPV vaccine which contrast findings in this work but the disagreement could be due to varying educational status and area of residence status.

Knowledge about symptoms of cervical cancer was low since only 17.2% students knew about 4 symptoms of cervical cancer. Knowledge about rick factors of cervical cancer was very low since just 4.2% the students knew about 5 risk factors of cervical cancer. The results of this study concerning knowledge about symptoms and risk factors of cervical cancer contrast Anantharaman (2013) findings which showed 85% of female health care providers knew about risk factors and symptoms of cervical cancer. The contrast in findings could be due to long term practice of female health care providers as compared to few years of practice or students who had not practice before in this study. Having 43.1% of students in this study obtaining their information from health workers was consistent with the result of a study among nurses in Nigeria where 37.4% obtained information on cervical cancers from health workers (Awodele *et al.*, 2011).

5.2 Proportion of respondents ever screened for cervical cancer

Some studies had indicated high knowledge of cervical cancer does not translate into high uptake of screening (Dike and Ijeoma, 2017; Gebreegziabher, Asefa and Berhe, 2016) and this concur with the finding of this research where respondents showed good knowledge about cervical cancer but low uptake of screening. The proportion of respondents who have ever screened for cervical cancer (13.2%) was in agreement with figures recorded for developing nations which are between 2-20% among urban women and 0.4-14.0% among rural women (John, 2011), but varies from between 68% to 84% reported for developed nations (Aswathy *et al.*, 2012). The contrast in screening uptake figures between developed nations and developing nations like Ghana could be because the former has strategies and guidelines to

promote uptake of cervical cancer screening while the later may have done little to promote screening uptake among women in their reproductive age.

The result of this study; 13.2% had screened for cervical cancer agrees with the findings of other studies in sub-Saharan Africa and other developing countries, where very few women have ever been screened for cervical cancer (Gebreegziabher, Asefa and Berhe, 2016). A study in Ethiopia revealed 10.7% of the participants had undergone screening and in Ghana too, another study revealed 11.6% of the participants in Kumasi had undergone screening (Adageba *et al.*, 2011). The findings from both studies are similar to the finding of this study and they all affirm low proportion of screening uptake among women in developing countries, be it health workers or non-health workers (Kokuro, 2017) hence the urgent need of programmes to promote increased uptake of screening in developing countries.

5.3 Proportion of respondents ever vaccinated against HPV

The study showed only one (0.3%) of the study participants had taken the HPV vaccine whereas in the US 36% girls had completed all three doses of HPV vaccination in 2011. Gavi and other international donor organizations supported Rwanda in a free HPV vaccination programme for girls and 90% girls were vaccinated for the first dose, 94% for the second dose and 93% for the third dose (Bailey *et al.*, 2016). Knowledge factor was seen to promote vaccination in the respondent who had undergone HPV vaccination as she stated, the vaccine can prevent cervical cancer. Vaccination against HPV is necessary to reduce the burden of cervical cancer globally. Unlike Ghana and others African countries, many developed nations have put in place strategies to ensure this important public health intervention is achieved.

5.4 Factors influencing cervical cancer vaccination and screening among trainee nurses and midwives

There are numerous factors that influence uptake of cervical cancer screening and vaccination. Many literature works had factors such as high level of knowledge, high educational status,

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age, marital status, multiparity, work status and other factors being associated with increased uptake of cervical cancer screening (Awodele *et al.,* 2011;Bakari, Takai and Bukar, 2015; Balarabe *et al.*, 2014;Gebreegziabher, Asefa and Berhe, 2016; Hill and Cox, 2017; Kokuro, 2017). According to Aswathy et al. (2012), factors responsible for low screening for cervical cancer could be grouped into knowledge factors, resource factors and psychosocial factors. Similarly, this study looked into the factors that were responsible for the low proportion of screened participants under knowledge factors, resource factors, psychosocial factors and socio-demographic factors.

In this study, multivariable analysis revealed previous employment ($p \leq 0.04$) and area of residence ($p \leq 0.04$) influenced screening for cervical cancer. The finding that previous employment influence screening agrees with finding from the work of Kokuro (2017) where work status was seen as having association with screening for cervical cancer. Previous employment influencing screening for cervical cancer could be due to high socioeconomic status of such students. This study revealed students in the rural areas often screened than their colleagues in the towns and cities. Many studies conducted about factors affecting uptake of cervical cancer screening showed low level of knowledge result in low uptake of screening but many others to reported high knowledge does not resulted in high uptake of screening. There was no correlation between the independent variables and have been vaccinated against HPV as this study revealed.

5.5 Limitation of the study

Limitations of the study include:

> This study was conducted among nursing and midwifery students in a metropolitan area where cervical cancer screening services are relatively available compared to institutions in other areas which lack such screening services. As such, the findings cannot be generalised to the entire population of nursing and midwifery students.

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CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Conclusion and recommendations

6.1 Conclusion

It can be concluded from the findings of this study that participant's knowledge of cervical cancer and HPV was good (87.3%) but that did not translate into increased uptake of cervical cancer screening and vaccination. The proportion of respondents screened for cervical cancer was 13.2% and only one person had vaccinated against HPV. Significant factors influencing cervical cancer screening were previous employment, most especially serving officers and area of residence.

6.2 Recommendations

The findings from this study requires that some measures are put in place to help address the factors that influence cervical cancer prevention in Ghana, therefore the following recommendations have been made:

The Government of Ghana through its agencies should prioritize a free national HPV vaccination and cervical cancer screening programme for women.

The Ghana Government through the Ministry of Health and Ghana Health Service should ensure HPV vaccination and cervical cancer screening services are available at all Teaching Hospitals, Regional Hospitals, District Hospitals and the Polyclinics.

The Health Promotion Unit of the Ghana Health Service should promote the public health importance of cervical cancer screening and vaccination among females in nursing and midwifery training institutions across the country and the general public as well.

Health Training Institutions in Ghana should periodically organize seminars and training orientation on cervical cancer for health trainees so as to improve their knowledge about cervical cancer for public health education and also help increase uptake of prevention methods.

The Nursing and Midwifery Council should have a sensitization programme on cervical cancer and the public health importance of screening and vaccination against HPV for health trainees.

The Cancer Society of Ghana should strongly advocate for support for free cervical cancer screening and vaccination at public health facilities for women in their reproductive age.

6.3 Suggestion for Further Study

It is suggested that further research can be carried out into the accuracy of cervical cancer messages to the public.

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APPENDICES

APPENDIX I: PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

Title of Research: Factors influencing cervical cancer prevention among health trainees in Kumasi.

Name and affiliation of researcher: The lead investigator is Bless Hayford Addo, currently a master's degree student of Population and Reproductive Health of the School of Public Health, KNUST.

Background: I am conducting a study on Factors influencing cervical cancer prevention among health trainees in Kumasi. This study is for academic purpose and a requirement for the award of Master of Public Health degree in Population and Reproductive Health. My

academic supervisor is Dr Edward Tieru Dassah of School of Medical Sciences, KNUST and Komfo Anokye Teaching Hospital.

Purpose of research: The purpose of this study is to determine factors influencing cervical cancer prevention among health trainees.

Procedure of the research: If you agree to participate in the study, the researcher will ask you to administer a questionnaire about Cervical Cancer, including your demographic data, knowledge, perception, attitude as well as your utilization of cervical cancer prevention services. About 350 questionnaires will be administered in all and it will take approximately 8 - 15 minutes to complete the questionnaire by providing answers to all the 46 questions if possible.

Risks and Benefits: There are no reasonably foreseeable harm that may arise from participating in this study but benefits that may arise include, contributing to Reproductive Health Policies and improving the knowledge and attitude regarding cervical cancer prevention among study participants.

Anonymity and Confidentiality: You are assured the information collected will be handled with the strictest confidentiality and will not be shared with any third party who was not directly involved with the research. The absence of names or personal identity on the questionnaire is a strong evidence that the information that will be collected cannot be traced to any individual person.

Voluntariness: Your participation in this study should be out of your own free will. You are not under obligation to provide responses for this study.

Withdrawal from the research: The study protocols do not pose any harm to subjects but if you are not comfortable with it you are free to refuse participation or redraw from the study at any point in time.

Consequence of Withdrawal: There will be no consequence if you choose to withdraw from the study. Please note however, that some of the information that may have been obtained from you without your identity before you chose to withdraw, may have been modified or used in analysis reports and publications. These cannot be removed anymore but good faith effort to comply with your wishes as much as practicable will be ensured and maintained.

Costs/Compensation: There are no costs associated with your participation in this study and you will not be paid for your participation too.

Contacts: If you have any question concerning this study, please do not hesitate to contact Bless Hayford Addo through the phone contacts or email address provided below for any clarification regarding this study hereafter.

Mobile contacts: 0249391939/0209346625

Email address: bleshay108@gmail.com

Further, if you have any concern about the conduct of this study, your welfare or your rights as a research participant, you may contact:

The Office of the Chairman

Committee on Human Research and Publication Ethics

Kumasi

Tel: 03220 63248 or 020 5453785

CONSENT FORM

Statement of person obtaining informed consent:

I have fully explained this research to ………………………………. and have given sufficient information about the study, including that on procedures, risks and benefits, to enable the prospective participant make an informed decision to or not to participate.

DATE:…………………………….   NAME: …………………………………

Statement of person giving consent:

I have read the information on this study and I have also talked it over with the researcher to

my satisfaction.

I understand that my participation is voluntary and not compulsory.

I know enough about the purpose, methods, risks and benefits of the research study to decide

that I want to take part in it.

I understand that I may freely stop being part of this study at any time without having to explain

myself.

I have received a copy of this information leaflet and consent form to keep for myself.

NAME:…………………………………………..

Signature:……………………………..

DATE:………………………………..

APPENDIX II: RESEARCH QUESTIONNAIRE

QUESTIONNAIRE FOR DATA COLLECTION ON FACTORS INFLUENCING
CERVICAL CANCER PREVENTION

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

**Mark (√) in the spaces [ ] provided, where appropriate. Only one tick is required per
question but multiple responses are allowed where it is indicated.**

Respondent Identification Number (RIN): ……………….. (Leave RIN for the researcher)

1. How old are you? ………….. (years)

2. What is your programme of study?

a. Nursing [ ]   b. Midwifery [ ]

3. Marital status

a. Single [ ]   b. Married [ ]   c. Divorced/Separated [ ]   d. Widowed [ ]

e. In a relationship / not legally married [ ]

4. Ethnic status

a. Akan [ ]   b. Ewe [ ]   c. Ga-Adangbe [ ]   d. Guan [ ]

e. Gurma [ ]   f. Mole-Dagbani [ ]   g. Grusi [ ]   h. Others [ ]

5. Religion

a. Christianity [ ]   b. Islam [ ]   c. Traditional [ ]   d. Others [ ]

6. Previous Employment status

a. Was working before school admission [ ]

b. Was not working before school admission [ ]

7. Number of children

a. None [ ]   b. One [ ]   c. Two   [ ]   d. Three [ ]   e. Four [ ]

f. More than four [ ] **8. Area of residence**

a. Urban [ ]   b. Rural [ ]

SECTION B: KNOWLEDGE OF CERVICAL CANCER

9. Have you heard of cervical cancer?

a. Yes [ ]   b. No [ ] If

No, Skip question 10.

10. How did you hear of cervical cancer? Multiple responses allowed

a. Health worker [ ]   b. Radio [ ]   c. Television [   ]   d. Internet [ ]
e. Read about it [ ]   f. Family [ ]   g. Friends [ ]   h. Others [ ]

11. Who can get cervical cancer?

a. Men [ ]   b. Women [ ]

c. Both a & b [ ]   d. Don‟t know [ ]

12. What are the symptoms of cervical cancer? Multiple responses allowed

a. Abnormal vaginal bleeding [ ]   b. Abnormal vaginal discharge [ ]

c. Bleeding after intercourse [ ]   d. Bleeding after menopause [ ]

e. Don't know [ ]

13. What are the risk factors for acquiring cervical cancer? Multiple responses allowed

a. Multiple sexual partners [ ]   b. Early age at first sexual intercourse [ ]

c. Smoking [ ]   d. prolonged use of oral contraceptives [ ]

e. HIV infection [ ]   f. Don't know [ ]

14. Have you heard about Human Papillomavirus (HPV)?

a. Yes [ ]　　　　　　　b. No [ ] If

No, Skip question 15.

15. If yes, how is it acquired?

a. Sexually transmitted [ ]　　　　b. Close contact [ ]　　　　c. Airborne [ ] d.

Don't know [ ]

16. Do you know of any relationship between HPV and cervical cancer?

a. Yes [ ]　　　　　　b. No [ ] If No, Skip question 17.

17. If yes, what is the relationship? Multiple responses allowed

a. HPV causes cervical cancer [ ]　　　　b. HPV is caused by cervical cancer [ ]

c. Cervical cancer is a sexually transmitted [ ]　　　　d. Don't know [ ]

18. Do you know about HPV vaccine?

a. Yes [ ]　　　　　　b. No [ ]

19. Going for the Human Papillomavirus vaccine can prevent cervical cancer.

a. Yes [ ]　　　　　b. No [ ]　　　　c. Don't know [ ]

20. HPV vaccine can be offered to females between.

a 9 – 13 years old [ ]　　　　b. 9 – 26 years old [ ]　　　　c. Above 26 years old [ ]

21. Have you heard about cervical cancer screening?

a. Yes [ ]　　　　　b. No [ ]　　　　　　　If No, Skip question 22.

22. Do you know of any cervical cancer screening method?

a. Yes [ ]　　　　　b. No [ ]

23. What is the recommended age for a woman to start screening for cervical cancer in Ghana?

a. 21 [ ]　　　　　b. 25 [ ]　　　　c. 31 [ ]

d. After 35 [ ]　　　　e. Don't know [ ]

24. Regular screening can reduce the risk of cervical cancer.

a. Yes [ ]　　　　　b. No [ ]　　　　c. Don't know [ ]

25. Treatment for cervical cancer is available in the hospital.

a. Yes [ ]　　　　　b. No [ ]　　　　c. Don"t know [ ]

26. Is cervical cancer preventable?

a. Yes [ ]　　　　　b. No [ ]　　　　c. Don't know [ ]

27. What cervical cancer screening method do you know? Multiple responses allowed

a. Pap smear test [ ]   b. Visual inspection with Lugol's iodine (VILI) [ ]

c. Visual inspection with acetic acid (VIA) [ ]   d. Don't know of any method [ ]

SECTION C: PERCEPTION TOWARDS CERVICAL CANCER SCREENING AND VACCINATION

28. Do you think cervical cancer can kill?

a. Yes [ ]   b. No [ ]   c. Don''t know [ ]

29. Is there any possibility that you could have cancer of the cervix?

a. Yes [ ]   b. Maybe [ ]   c. No [ ]   d. Don't know [ ] **30.**

What do you think about screening for cervical cancer?

a. It is very important [ ]   b. It is important [ ]   c. I don't have any opinion about it [ ]

d. I feel indifferent about it [ ]   e. It is not important [ ]

31. What do you think about screening regularly for cervical cancer?

a. It is always necessary [ ]   b. It is only necessary if there was a bad result [ ]

c. It is not necessary [ ]   d. I feel indifferent about it [ ]

e. I don't have any opinion about it [ ]

32. What are the benefits of screening for cervical cancer? Multiple responses allowed

a. It can detect cervical cancer early [ ]   b. It gives me a sense of control [ ]

c. There are no benefits [ ]   d. I don't know of any benefits [ ]

SECTION D: ATTITUDE TOWARDS CERVICAL CANCER SCREENING AND VACCINATION

33. Would you accept to screen for cervical cancer if the services are available?

a. Yes [ ]   b. No [ ]   c. Maybe [ ]   d. Never [ ]

34. Would you accept to vaccinate against HPV if the services are available?

a. Yes [ ]   b. No [ ]   c. Maybe [ ]   d. Never [ ]

SECTION E: UTILIZATION OF CERVICAL CANCER SCREENING SERVICES AND VACCINATION

35. Have you ever screened for cervical cancer?

a. Yes [ ]   b. No [ ]

If No, move to **question 40**. If yes, continue with **question 36**.

36. When was the last time you screened for cervical cancer?

a. < 1 year ago [ ]   b. 1 – 2 years [ ]   c. 3 – 5 years [ ]

d. More than 5 years ago [ ]   d. Can't remember [ ]

37. How often do you screen for cervical cancer?

a. every 1-3 years [ ]   b. Anytime I remember [ ]

c. Whenever I hear someone died of cancer [ ]   d. Don't know [ ]

38. What method did you use the last time you screened for cervical cancer?

a. Pap smear test [ ]   b. Visual inspection with Lugol's iodine (VILI) [ ]

c. Visual inspection with acetic acid (VIA) [ ]   d. Don't know the name [ ]

39. Why do you screen for cervical cancer? Multiple responses allowed

a. I can afford the cost of screening [ ]   b. Because if it is detected early, it can be cured [ ]

c. Because I could have the disease [ ]   d. Because my doctor recommends it [ ]

e. Because cervical cancer kills and I don't want to die from it [ ]

f. My family encourages me too [ ]   g. My friend died of cervical cancer [ ]

h. A close relation died of cancer [ ]

40. Why have you never screened for cervical cancer? Multiple responses allowed

a. I am not aware of any screening test [ ]   b. Because I can't have cervical cancer [ ]

c. I am scared of receiving a bad result [ ]   d. I don't have any symptoms [ ]

e. It's a waste of money [ ]   f. It is against my faith [ ]

g. It is expensive [ ]   h. I don't know of any screening centre [ ]

i. Our culture forbids it [ ]   j. I will become infertile [ ]

 k. I hear it is painful [ ]   l. I may be embarrassed [ ]

41. Have you ever vaccinated against HPV?

a. Yes [ ]   b. No [ ]   c. Don't know [ ] If **No**,

move to **question 46**. If yes, continue with **question 42.**

42. At what age did you have the HPV vaccination?

a. Age 9 – 13 [ ]   b. Above age 13 [ ]

43. How many times were you vaccinated?

a. 1 time [ ]   b. 2 times [ ]   c. 3 times [ ]   d. Don't remember [ ]

44. What type of HPV vaccine were you given?

a. Gandasil [ ]   b. Cervarix [ ]   c. Don't know

**45. Why do you vaccinate against HPV? Multiple responses allowed**

a. I can afford the cost of vaccination [ ]

b. Because it can help prevent cervical cancer [ ]

c. Because I could have the disease [ ]

d. Because it was recommended to me [ ]

46. Why have you not vaccinated against HPV? Multiple responses allowed

a. I don't know there is a vaccine for cervical cancer [ ]

b. Because I can't have cervical cancer [ ]

c. I am scared of side effects [ ]

d. I don't have HPV infection [ ]

e. It's a waste of money [ ]

f. It is against my faith [ ]

g. It is expensive [ ]

h. I don't know where to go for the vaccination [ ]

i. Our culture forbids it [ ]

APPENDIX III: GOOGLE MAP LOCATING AND IMAGE OF NURSING AND MIDWIFERY TRAINING COLLEGE, KUMASI
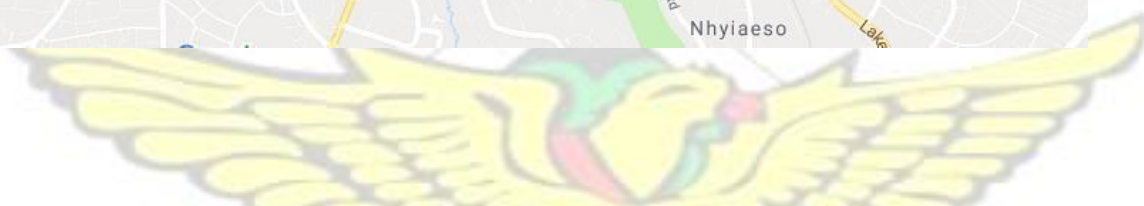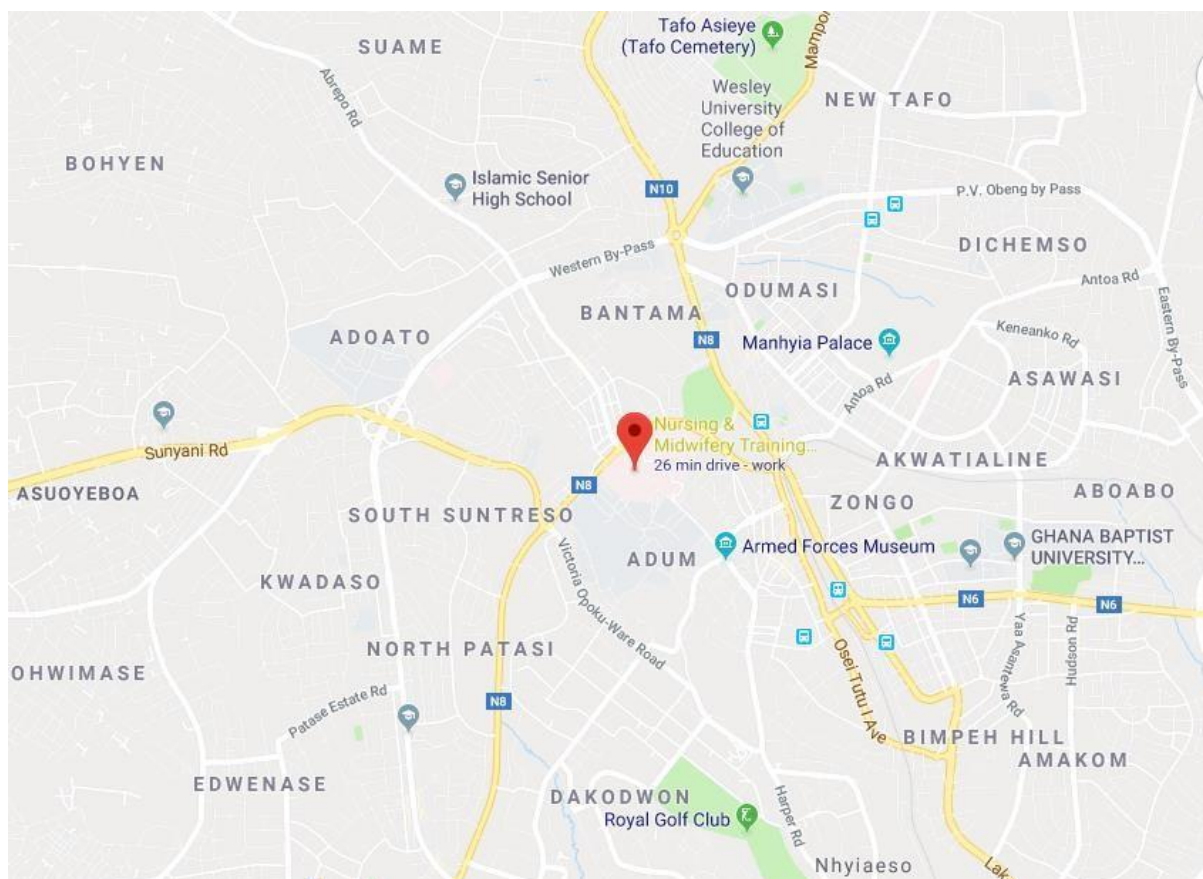
APPENDIX IV: ETHICS REVIEW LETTER OF APPROVAL

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICAL SCIENCES / KOMFO ANOKYE TEACHING HOSPITAL
COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS

Our Ref: CHRPE/AP/051/19

19th February, 2019.

Mr. Bless Hayford Addo
Post Office Box KS 9742
Adum
KUMASI.

Dear Sir,

LETTER OF APPROVAL

Protocol Title: *"Factors Influencing Cervical Cancer Prevention among Health Trainees in Kumasi."*

Proposed Site: *Nursing and Midwifery Training College, Kumasi.*

Sponsor: *Principal Investigator.*

Your submission to the Committee on Human Research, Publications and Ethics on the above-named protocol refers.

The Committee reviewed the following documents:

- A notification letter of 27th June, 2018 from the Department of Population, Family and Reproductive Health, KNUST seeking permission to conduct the study at Nursing and Midwifery Training College, Kumasi (study site) and it was approved.
- A Completed CHRPE Application Form.
- Participant Information Leaflet and Consent Form.
- Research Protocol.
- Questionnaire.

The Committee has considered the ethical merit of your submission and approved the protocol. The approval is for a fixed period of one year, beginning 19th February, 2019 to 18th February, 2020 renewable thereafter. The Committee may however, suspend or withdraw ethical approval at any time if your study is found to contravene the approved protocol.

Data gathered for the study should be used for the approved purposes only. Permission should be sought from the Committee if any amendment to the protocol or use, other than submitted, is made of your research data.

The Committee should be notified of the actual start date of the project and would expect a report on your study, annually or at the close of the project, whichever one comes first. It should also be informed of any publication arising from the study.

Yours faithfully,

Osomfo Prof. Sir J. W. Acheampong MD, FWACP
Chairman