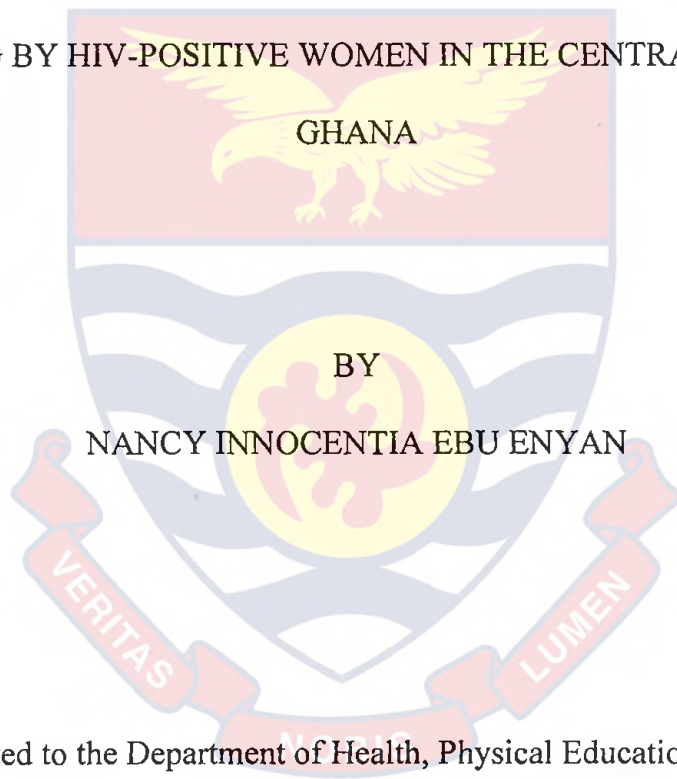© 2017

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FACTORS INFLUENCING INTENTION TO OBTAIN CERVICAL CANCER

SCREENING BY HIV-POSITIVE WOMEN IN THE CENTRAL REGION OF

GHANA

BY

NANCY INNOCENTIA EBU ENYAN

Thesis submitted to the Department of Health, Physical Education and Recreation

of the Faculty of Science and Technology Education, College of Education

Studies, University of Cape Coast, in partial fulfilment of the requirements for the

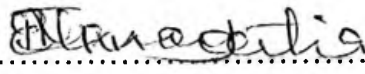award of Doctor of Philosophy degree in Health Promotion

OCTOBER 2017

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that

no part of it has been presented for another degree in this university or elsewhere.

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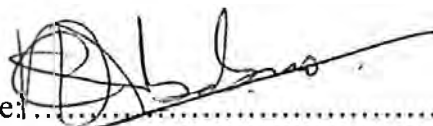
Name: Nancy Innocentia Ebu Enyan

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were

supervised in accordance with the guidelines on supervision of thesis laid down

by the University of Cape Coast.

Principal Supervisor's Signature: .... Date: ....

Name: Professor Joseph Kwesi Ogah

Co-Supervisor's Signature: .... Date: ....

Name: Dr. Charles Domfeh

ABSTRACT

The purpose of this study was to determine the factors influencing intention to obtain cervical cancer screening by HIV-positive women in the Central Region of Ghana. A descriptive cross-sectional study was conducted with 660 HIV-positive women aged 20 to 65 years using interviewer administered questionnaire. Data were summarised using frequencies, percentages and binary logistic regression analysis. The findings showed that 82% (n = 540) of the respondents had intention to seek cervical cancer screening. The predictors of cervical cancer screening intention by HIV-positive women were knowledge about cervical cancer screening, cues, perceived seriousness, perceived benefits and level of education. Specifically, HIV-positive women with moderate knowledge about cervical cancer screening were 3.54 times more likely to have intention to screen (95% CI, 1.61-83), high knowledge about cervical cancer screening were 2.75 times (95% CI, 1.43-5.31), high cues were 3.48 times (95% CI, 1.43-8.49), high perceived seriousness were 2.02 times (95% CI, 1.24-3.30), high perceived benefits were 1.68 times (95% CI, 1.05-2.71), low level of education were 2.67 times (95% CI, 1.61-4.42), and high level of education were 3.16 times (95% CI, 1.42-7.02) more likely to have intention to screen. Cervical cancer screening initiatives for HIV-positive women need to focus on increasing knowledge about screening, cues, and enable women to have high perception of the benefits and seriousness of the disease. Education of women should be given the needed priority as it could enable them adopt behaviours that will decrease risk of cervical cancer and promote health.

KEY WORDS

Cervical cancer

Cervical cancer screening

Factors

Ghana

HIV-positive women

Intention

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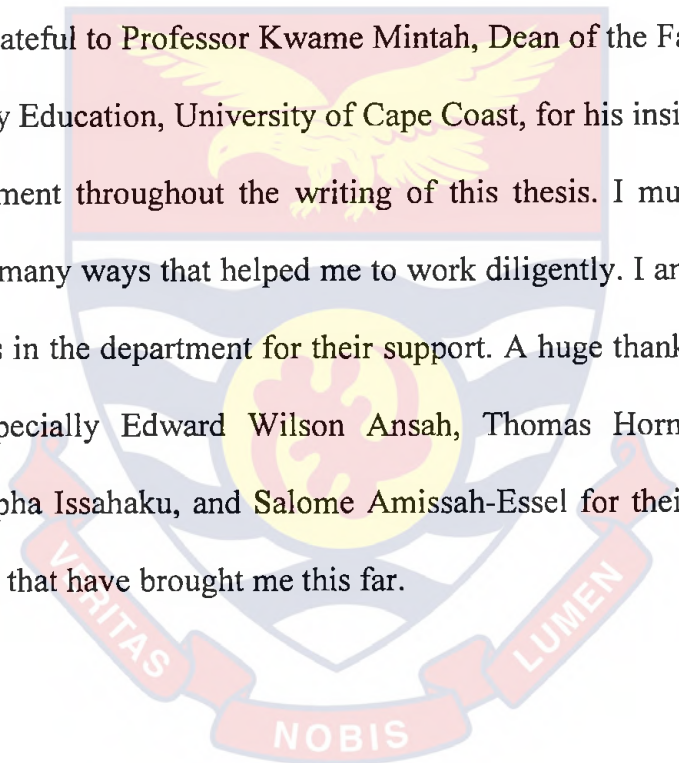
DEDICATION

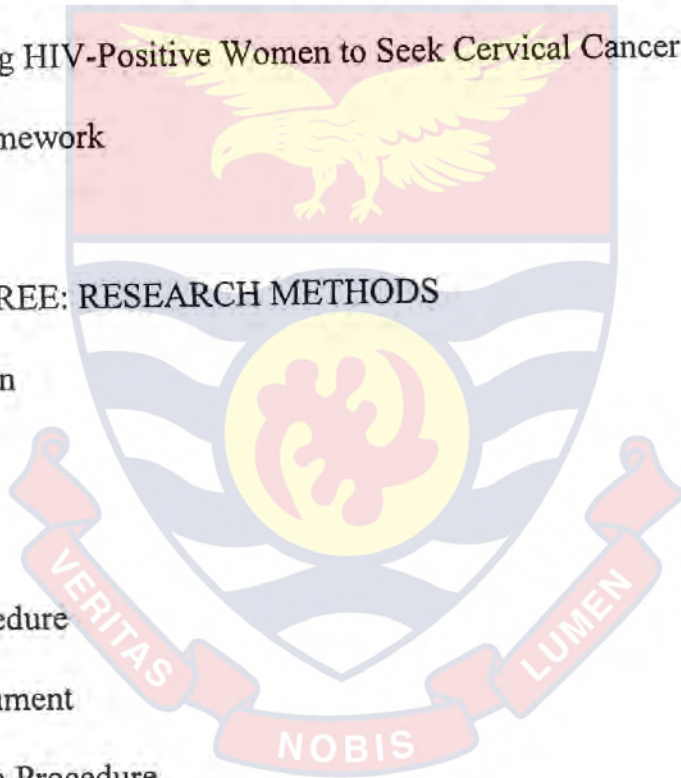To my husband, Mr. Ernest K. Enyan, and our son.

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CHAPTER ONE

INTRODUCTION

Background to the Study

Cervical cancer is a major problem of international health concern. It is estimated that three quarters of all cervical cancer cases occur in low-to-middle income countries where screening and treatment facilities are limited (World Health Organisation [WHO], 2012a). According to WHO (2013a), mortality from cervical cancer could reach 5 million by 2018 in resource poor settings. In sub-Saharan Africa (SSA), cervical cancer is the most common cancer affecting women (Anorlu, 2008). The disease can affect women in all age groups. Women in younger age groups mostly contract the disease due to their tendency to have multiple sexual partners, early age of sexual debut and/or sexually transmitted infections (STI's) which have a strong association with the human papilloma virus (HPV) (WHO, 2012b). Evidence suggests that HPV infection might take 15 to 20 years to develop into cancer in individuals with normal immune function (WHO, 2013b).

In SSA, over 80% of cancer of the cervix cases is detected at the terminal stages because of inadequate information about the disease and facilities for early prevention (Adanu et al., 2010; Bingham et al., 2003). The survival rates after radiotherapy or surgery for cases diagnosed at the end stages of the disease are low but could be associated with huge financial implications. Again, the treatment of cervical cancer might not be easily accessible and available to vulnerable women, as it might be too costly or the appropriate technologies are not accessible to women in low-middle income countries (Adanu et al.).

Although women can be potentially exposed to HPV and cervical cancer, socio-economic and ethnic disparities can heighten the risk of contracting cervical cancer and affect the pattern of cervical screening behaviour. This is evident in the area of cervical cancer survival, incidence and death, but the greater impact might be experienced by poor women (Donnelly & Gavin, 2012). This implies that people with more financial resources may be in a better position to access cervical screening and treatment facilities than disadvantaged women. The level of knowledge, attitudes and cultural beliefs of women are critical in reducing the high rates of infection of HPV and cervical cancer (Fernandez et al., 2009). The United Nations Population Fund (UNFPA) (2011) affirmed that efforts aimed at preventing and controlling cervical cancer, such as cervical screening, need to be designed to target marginalised women in the society, those in deprived areas and within the lower socio-economic class, to have a greater impact on reducing cervical cancer mortality and related morbidity.

Cervical cancer screening aims at decreasing cervical cancer mortality and morbidity by detecting early precancerous lesions that can potentially develop into invasive cancer. In countries where quality screening facilities are available, the Papanicolau (Pap) test or cytology screening has been highly successful in lowering cancer of the cervix incidence and mortality, but false positive results might be common. This is an area of utmost concern (Castle et al., 2010; ASCUS-LSIL Triage Study [ALTS] Group, 2003). The HPV test, compared to the cytology screening, could forecast which category of women may develop an invasive type of cervical cancer in 5 to 15 years (Saslow et al.,

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2012). Previous studies have recommended that combining HPV testing and cervical screening could maximise the health benefits women receive. For instance, there might be an increase in disease detection rate and a decrease in the duration of screening intervals. These may aid in decreasing the degree of psychosocial harms, such as screening positive, additional procedures, frequent visits to the clinical sites, and follow ups (Schiffman et al., 2012; Sherman et al., 2003).

Cervical screening is critical in preventing cancer of the cervix, especially in SSA. Despite some successes with cervical screening programmes in high income countries, inadequate resources and lack of effective strategies to promote screening among women (Denny & Anorlu, 2012) have affected screening uptake. Empirical evidence suggest that poor health-seeking behaviour, lack of knowledge, poor education, low status of women, poverty, influence of culture, religion, long distance to a facility providing cervical screening (Anorlu, 2008), and dissatisfaction with screening procedure (Chigbu, Onyebuchi, Egbuji & Ezugwu, 2015) have affected utilisation of screening services. Empirical studies conducted in Kenya and Ghana reported women normally sought cervical screening at the advanced stages of the disease. They may not be knowledgeable about the disease and that could result in poor attitudes towards screening (Adanu et al., 2010; Ebu, Mupepi, Siakwa & Sampselle, 2014; Bitok Kivuti, Pokhariyal, Abdul, & McDonnell, 2013). Public education about cervical cancer is needed to improve screening uptake (Lyimo & Beran, 2012). However, from the perspectives of health care providers, inadequate infrastructure, lack of

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competent personnel and medical supplies are the main challenges to cervical cancer screening (Adanu et al.; Bitok Kivuti et al.).

Recent WHO guidelines stipulate that all women who are sexually active need cervical screening. This is of particular importance to HIV-positive women in HIV endemic areas as well as non-endemic settings. The practice of engaging HIV-positive women in cervical cancer screening is a vital public health action since they have an increased risk of HPV infection. Screening is recommended for women 30 years of age and above because there is an increased risk of cervical cancer among them. There could be variations regarding the benefits one could derive from screening among different age groups, and depending on the baseline risk of developing Cervical Intraepithelial Neoplasia (CIN) Grade 2, screening could be extended to both younger and older women (WHO, 2013c).

The Alliance for Cervical Cancer Prevention (ACCP) (2007) explained that in resource-constrained countries, for maximum public health benefit of cervical screening to be realised, women should be screened when they are between 30 and 40 years of age. Although cytology-based programmes such as the Pap tests have proven to be effective in industralised countries, it is difficult sustaining such programmes in resource-scarce settings. Therefore, cost-effective initiatives that are of quality need to be initiated. Alternative approaches to cervical screening include cervicography, visual inspection with lugol's iodine and speculoscopy. These strategies are simple but highly effective in promoting a "screen and treat" method where a client is screened, diagnosed and treated at the same time or in a single visit (Denny et al., 2005; Wright & Kuhn, 2012).

In Ghana, the Ministry of Health (MOH) guidelines for non-communicable diseases screening including cervical cancer recommend visual inspection with acetic acid (VIA) for females aged 25-45 years and the Pap test for females above 45 years of age. This implies that the health system must be adequately prepared in the area of capacity building programmes for midwives and nurses in VIA, Pap test and cryosurgery training. In addition, training in documentation of information, education and counselling might enable women to seek cervical cancer screening services (MOH, 2014).

The data available suggest that less than 5% of Ghanaian women obtain cervical screening as compared to 80% of women in Australia and over 70% in Europe and the United States (Habbema, De Kok & Brown, 2012; Solomon, Breen & McNeel, 2007). In Ghana, cervical cancer screening is available in major teaching and regional hospitals as well as some private medical laboratories across the country. However, access to cervical screening is limited at the district and sub-district levels (Adanu, 2002; MOH, 2011). Surgery and chemotherapy as options for treating cervical cancer could be obtained in some regional and teaching hospitals. Radiotherapy services are, however, not common in Ghana. Currently, two teaching hospitals, Komfo Anokye Teaching Hospital in Kumasi and Korle-bu Teaching Hospital in Accra offer radiotherapy services. Additionally, the Sweden Ghana Medical Centre, which is a private health facility in Accra, manages cancer cases with radiotherapy (Ghana Health Service [GHS], 2013).

A more critical condition that demands that women obtain cervical screening is the human immunodeficiency virus (HIV) problem in SSA, and

Ghana for that matter. The HIV is a disease of global health concern, and so far, over 39 million people have died as a result of it (WHO, 2014a). According to WHO, about 1.5 million people lost their lives due to HIV-related causes worldwide in 2013. Globally, SSA is the worst affected by HIV/AIDS. The people living with HIV (PLHIV) as of 2013 in SSA were 24.7 million, accounting for 70% of the total of HIV infections recorded globally (WHO). Several studies have found a strong relationship between HIV and HPV, as they both work synergistically to cause neoplasia of the cervix (Bouvard et al., 2009; Denny & Wright, 2009; Mupepi, Sampselle & Johnson, 2011; WHO, 2007).

It has been observed that the life expectancy among HIV-positive individuals has increased due to the use of highly active antiretroviral treatments, but this has also increased their risk of developing cancer (Sasco et al., 2010). Several studies have reported a relationship between HIV, HPV and cervical cancer (Kumakech, Andersson, Wabinga, & Berggren, 2014; Mupepi et al., 2011; Ndiaye et al., 2012). Evidence from a systematic review conducted in SSA showed a strong association between HIV infection and neoplasia. The study reported that HIV could potentially increase the likelihood of developing invasive cervical cancer, as the relationship between HIV and invasive cervical cancer has long been established (Bonnet et al., 2004). Ndiaye et al. and Holmes et al. (2009) found a correlation between HIV, HPV types 18 and 45, and cervical cancer.

Although HIV is endemic in Ghana, cervical cancer screening services are not easily accessible (GHS, 2013). Data available at the Kumasi Cancer Registry from 2004 to 2011 suggested that cancer of the cervix was the most

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common occurring cancer among Ghanaian women (African Cancer Registry Network [AFCRN], 2013). It is well documented that HPV types 16 and 18 could cause 51% of the cases and result in 16% of cancer deaths (GHS). Ghanaian women have a 13% risk of developing cervical cancer and a 11% chance of dying from the same condition before reaching 75 years of age (GLOBOCAN, 2008). This means that women who are at a higher risk of developing cancer of the cervix are those within the reproductive age. By 2025, cervical cancer cases in Ghana could rise to over 5,000 with an annual mortality of 3,300 (WHO, 2013a). Adanu et al. (2010) and Gaffikin, Lauterbach, Emerson and Lewis (2004) asserted that the absence of national policy and procedures on cervical cancer screening limits access to screening services.

Mwanahamuntu et al. (2013) asserted that nurse-led cervical cancer screening with a particular focus on women with HIV could also be expanded to serve all women irrespective of their HIV status. It seems plausible to assume that incorporating cervical cancer screening into other existing vertical health programmes such as HIV/AIDS programmes would increase the uptake of cervical screening. Kumakech et al. (2014) explained that women with HIV-positive status are more likely to develop cervical cancer than those with HIV-negative status. Nonetheless, screening programmes for both HIV and cervical cancer seem to be disintegrated. Integrating the two services will benefit all the stakeholders of the health system substantially. This will however require strengthening of the health system in the areas of infrastructure, motivation of health workers, supply of drugs, and logistics.

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In a study conducted in Nigeria, HIV-positive women were willing to have cervical screening. This suggests that integrating reproductive health services into HIV programmes could facilitate cervical screening and strengthen the services rather than disrupt the existing services (Ezechi, Gab-Okafor, Ostergren & Pettersson, 2013). In Kenya, the integration of cervical screening into HIV programmes has been found to be feasible but there is the need for a cost and benefit analysis to be performed (Huchko, Bukusi & Cohen, 2011). Mahomed et al. (2014) reported that improving self-collection - a technique where women collect their own cervical or vaginal specimen for cervical cancer screening - among HIV-positive women might increase cervical screening coverage, as HIV-positive women have varied preferences for self-collection devices for HPV testing. Despite this, gender-related discrimination and economic constraints are significant barriers to accessing preventive health services among HIV-positive women (Halperin et al., 2011).

Statement of the Problem

Despite the high incidence and mortality rates of cervical cancer in sub-Saharan cultures, screening for early detection of precancerous lesions are not frequently done (WHO, 2013a, Mupepi et al., 2011). HIV positive women are required to screen for cervical cancer due to the high prevalence that has been observed, and the faster advancement of cervical precancerous lesions among this population (ACCP, 2007). Additionally, cancer of the cervix in HIV-positive women could be complicated by expanded access to a highly-active antiretroviral therapy (Atashili et al., 2011). Nonetheless, screening, even once, could potentially minimise cervical cancer mortality among HIV-positive women in Africa (Atashili et al.). Cervical screening could detect HIV-positive women who

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might be at risk for developing invasive cervical cancer. Therefore, early detection is necessary in ensuring regular follow up and effective treatment (Madeddu et al., 2014).

The Central Region recorded HIV prevalence of 1.4% which was higher than the national average in the 2014 HIV Sentinel Survey (NACP/GHS/MOH, 2015). For this reason, the promotion of cervical screening among HIV-positive women is an important public health task that would improve the health of vulnerable women and reduce inequalities. Previous studies have examined cervical screening behaviour of college students, perceptions of men about screening and women towards cervical cancer screening (Abotchie & Shokar, 2009; Adanu et al., 2010; Ebu et al., 2014; Williams & Amoateng, 2012). Although HIV-positive women are more vulnerable to cervical cancer, there is paucity of data on the factors influencing intention to obtain cervical cancer screening by HIV-positive women in the Central Region of Ghana to date.

Purpose of the Study

The purpose of the study was to assess the levels of knowledge of HIV-positive women about cervical cancer and screening, determine the extent to which perceived susceptibility, seriousness, benefits, barriers, and cues about cervical cancer screening influence intentions to obtain screening test, and to identify the demographic factors influencing intention of HIV-positive women to seek cervical screening in the Central Region of Ghana.

Hypotheses

The study hypothesised that:

1. More HIV-positive women with moderate to high knowledge about cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low knowledge.

2. More HIV-positive women with moderate to high knowledge about cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with low knowledge.

3. More HIV-positive women with high cues about cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low cues.

4. More HIV-positive women with high perceived seriousness of cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low perceived seriousness.

5. More HIV-positive women with high perceived benefits of cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with low perceived benefits.

6. More HIV-positive women with low perceived barriers to cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with high perceived barriers

7. More HIV-positive women with high perceived susceptibility to cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low perceived susceptibility.

8. Socio-demographic factors predict intention to seek cervical cancer screening.

Significance of the Study

Cervical cancer can be prevented when precancerous lesions are detected early and managed. The findings of this study could be used to plan health promotion interventions on cervical cancer screening. For instance, the GHS could plan and provide cervical cancer screening services for HIV-positive women. In addition, the MOH and GHS could intensify public health education on cervical cancer screening among HIV-positive women to increase knowledge about screening since that could influence intentions to screen. The findings could also guide policy formulation of cervical cancer screening for HIV-positive women to decrease cervical cancer mortality and promote the health of these women. In addition, it will guide the Central Regional Health Directorate (CRHD) in the formulation of health education messages and production of educational materials on cervical cancer screening for HIV-positive women in the Central Region of Ghana by ensuring that it focuses on the benefits one could derive from participating in cervical cancer screening. The seriousness of the disease could be emphasised since it could lead to intention to screen.

Furthermore, the findings could enable the MOH, GHS and other relevant stakeholders to increase cues about cervical cancer screening by engaging in media campaigns about the disease, intensifying education at the various HIV centres in the Central Region. The services of mobile telecommunication companies could be engaged in spreading messages about the disease as part of their corporate social responsibility. Again, the findings could help policy makers, planners and government to make education of women a priority since it

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has a strong influence in enabling HIV-positive women to adopt health behaviours such as having the intention to seek cervical cancer screening.

The findings could enable the relevant stakeholders to plan interventions to remove the multiple barriers HIV-positive women may encounter as they strive to seek cervical screening. It could serve as a basis for which further research on cervical cancer screening among HIV-positive women in Ghana could be developed.

Delimitation

The study focused on HIV-positive women between 20 and 65 years old in the Central Region of Ghana. Although the guidelines for non-communicable diseases in Ghana recommend cervical screening for women who are 25 years and above, this study included HIV-infected women who were under 25 years, including 20 year olds. Although they were not eligible for screening, the study tested their knowledge of the risk factors as well as the perceived benefits of screening. When they have the right information about cervical cancer screening, they will be able to take appropriate decisions when eligible for screening. The women were regular attendants of the HIV/AIDS clinics randomly selected for the study. The study excluded HIV-positive women with dementia and those who were terminally ill as they might not be able to produce valid responses.

The research design was delimited to a cross-sectional survey. A questionnaire was used with constructs from the Theory of Planned Behaviour (TPB) by Ajzen and Fishbein (1985) and the Health Belief Model (HBM) by Becker (1974). Some of the items were adapted from Hassani et al. (2014) and others adopted from Mupepi et al. (2011). The independent variables were

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knowledge about cervical cancer, knowledge about cervical cancer screening, perceived susceptibility, seriousness, benefits, barriers, cues to action, and demographic factors including age, marital status, level of education, employment status, religion, and economic ability to afford the cost of screening. The dependent variable was intention to obtain cervical cancer screening test. The data were processed with the Statistical Package for Social Sciences (SPSS) version 21.0, and analysed using frequencies, percentages and binary logistic regression.

Limitations

The descriptive cross-sectional survey design could not allow cause and effect relationships to be established as data were collected as snapshots and information on the variables were collected simultaneously. An interviewer-administered questionnaire was used which could lead to a possibility of social desirability bias as respondents might give answers that put them in good light (Robson, 2011). Although random procedures were used in selecting the health facilities where data were collected as well as the proportion of participants interviewed in each facility, the nature of the problem did not permit the use of random procedures in selecting the participants at the time of data collection. For this reason, accidental quota sampling was used. Consequently, the sample drawn might not be representative enough which could impact the external validity or generalizability of the study. Furthermore, since the study was a survey, and survey data tend to affect the characteristics of respondents, for instance their motivation, memory, and knowledge, there was the possibility of response style bias, recall bias and memory bias (Black, 2002).

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Definition of Terms

Antiretroviral therapy: Medication that is highly effective in treating HIV.

Cancer: The development of abnormal cells in such a way that the body cannot control it.

Cervicography: A diagnostic test for cervical cancer in which a picture of the cervix is taken by someone who is not a medical doctor, but is interpreted by the medical doctor.

Cervix: A soft cylinder-shaped neck that connects the uterus and the vagina.

Chemotherapy: The use of anti-cancer drugs to manage people with cancers by halting the multiplication of the cancer cells.

Confidence interval (CI): The range of values within which a population parameter is estimated to lie, at a specified probability of accuracy. In this study, it was set at 95%.

Cryotherapy: This involves the use of low temperature to treat both benign and malignant cervical lesions.

Cues to action: Prompts or a reminder of an individual to engage in health action which is congruent with her intention.

Intention: The behavioural willingness to obtain cervical cancer screening or otherwise.

Lesions: An abnormal change in a tissue as a result of a disease.

Malignant: Associated with uncontrolled growth of abnormal cells.

Neoplasia: An abnormal multiplication of cells forming an abnormal mass of tissue.

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Pap smear: An examination of cells scraped from the cervix microscopically to detect any abnormalities.

Perceived barriers: Factors perceived to be hindering one's ability to engage in a health action or overcoming possible factors associated with taking the behaviour.

Perceived benefits: Subjective benefits of engaging in a health action to prevent a perceived threat which is influenced by an individual's level of motivation.

Perceived severity: Subjective evaluation of an individual to perceive the seriousness or the possible consequences of a disease or condition.

Perceived susceptibility: Individual's subjective perception of being at risk of a disease or a condition.

Precancerous: The development of cervical lesions that might be associated with cancer.

Screening: A health promoting activity aimed at identifying cervical cancer early in individuals.

Self efficacy: The confidence to perform a health-related activity or a specific task.

Sensitivity: The percentage of people living with cervical cancer that the cervical screening test correctly detects.

Services: The care provided to women who attempts to obtain cervical cancer screening.

Specificity: The percentage of people who do not have cervical cancer that the cervical screening test correctly provides information as being negative.

Speculoscopy: The use of a light source to examine the presence of precancerous lesions.

Organisation of the Study

The study was organised into five chapters. Chapter one focused on the background to the study, statement of the problem, purpose of the study, hypotheses, and significance of the study, delimitation, limitations and definitions of terms. Chapter two highlighted the review of literature about the study as well as those closely related to it. The theoretical basis of the study was also discussed. Chaper three presented the methodology with a focus on the research design, population, sample and sampling procedure, instrument, data collection procedure and data analysis. Chapter four presented the results and discussion of the study. The descriptive results for the entire study were presented followed by the hypotheses that guided the study. Chapter five presented the summary, conclusions and recommendations drawn from the findings.

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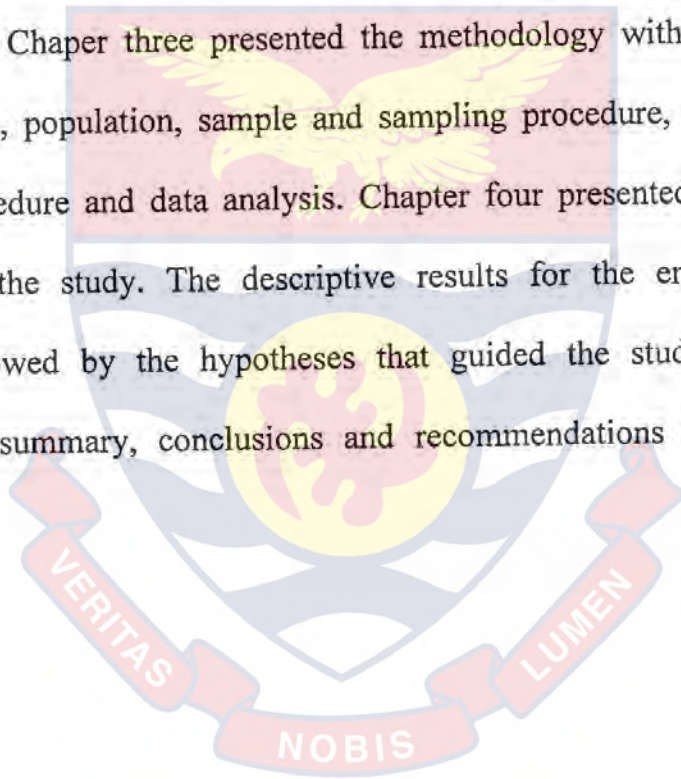
CHAPTER TWO

LITERATURE REVIEW

The purpose of the study was to assess the levels of knowledge of HIV-positive women about cervical cancer and screening, determine the extent to which perceived susceptibility, seriousness, benefits, barriers, and cues about cervical cancer screening influence intentions to obtain screening test, and to identify the demographic factors influencing intention of HIV-positive women to seek cervical screening in the Central Region of Ghana. The goals of this chapter are to demonstrate how past research studies are related to this study and to critically appraise and synthesise the body of scientific knowledge on cervical cancer screening among HIV-positive women and other empirical studies that are closely related to it. Reviewing the literature will help the reader to appreciate and share the results of other studies that are similar to the subject under investigation. The literature review provides the basis for comparing the results of this study with findings from other research works.

The literature was obtained from both electronic and print sources, including major databases; Pubmed, BioMed Central, Nursing/academic edition, and Google Scholar. The following key words were combined to retrieve potentially relevant studies: cervical cancer, knowledge, women, HIV-positive women, sexually transmitted infections, screening, health screening, sub-Saharan Africa, Ghana, developing countries, perceived barriers, factors, intention, perceived susceptibility, perceived seriousness, risk, perceived benefits, cues, demographic factors, and HPV. Boolean operators such as AND, NOT and OR were used in retrieving relevant studies for the review.

The chapter highlights the following: definition and etiology of cervical cancer, prevalence of cervical cancer, magnitude of the problem of cervical cancer, efforts in dealing with cervical cancer in Ghana, overview of the health care system in Ghana, treatment, and prevention of cervical cancer. It presents information on the concept of cervical cancer screening, methods of cervical cancer screening, determinants of cervical cancer screening, challenges with cervical cancer screening in Ghana, demographic factors influencing cervical cancer screening among HIV-positive women, theories and models of behaviour change, constructs in the theory in relation to cervical cancer screening among HIV-positive women, and the conceptual framework underpinning the study.

Definition and Etiology of Cervical Cancer

Cervical cancer is an uncontrollable growth of abnormal or malignant cancer cells at the cervical region of the uterus, which has the potential of spreading to other tissues (WHO, 2015). The etiology of cervical cancer is linked with multiple factors. The interaction between cancer-causing viruses and exposures from cervical tar might lead to cancer of the cervix. Cervical tars exposures such as persistent inhalation of smoke from wood, cigarette smoking, use of coal-burning stove in enclosed kitchen are potentially carcinogenic (Haverkos, 2015). This review focuses on the following etiological factors; cervical cancer precursors, HPV, and the interaction between HIV and HPV, as clinical and epidemiological evidence strongly suggests that they could lead to the development of cervical cancer.

Cervical Cancer Precursors and Invasive Cervical Cancer

Solomon et al. (2002) explained that pre-invasive cervical cancer precursors might progress steadily into invasive squamous cell carcinoma of the mouth of the uterus or cervix. These precursors are known as dysplasia or CIN. Histologically, CIN has been graded into three forms namely: mild, moderate or severe lesions. All these might potentially lead to cancer, but not all of them do so, as a high proportion of the mild and moderate type of lesions resolve naturally. Another important classification which focuses on the findings of cytology is the Bethesda system. According to Solomon et al. p. 2114, this system categorises CIN into:

1. Atypical squamous cells of undetermined significance (ASCUS) – This is where one cannot rule out low-grade squamous intraepithelial lesions (LSIL).

2. LSIL- There is the presence of cytologic atypical cells and CIN grade 1.

3. High-grade squamous intraepithelial lesions (HSIL)-There is the presence of CIN grades 2-3 and carcinoma.

Invasive cervical cancer (ICC) is an identifiable cause of cancer-related diseases and deaths among women globally, although there are geographical variations (Ferlay et al., 2010). In advanced settings, many successes have been achieved over the past six decades in decreasing the burden of ICC. Significant successes were possible through investments in the healthcare sector, especially the introduction of screening programmes and proper diagnostic procedures.

HPV and Cervical Cancer

HPV is the causative agent of cervical cancer (WHO, 2013a). It belongs to a group of viruses called the deoxyribonucleic acid (DNA) viruses that have the potential of infecting mucosal cells and the skin. There are over 100 types of the HPV. Thirteen of the HPV types (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68) are carcinogenic while other HPV types (26, 53, 66, 67, 70, 73, 82) are known to be potentially carcinogenic (Bouvard et al., 2009). It is estimated that HPV causes 100% of cancer of the cervix, 90% of anal cancer, 40% of cancer of the vagina, vulva and penis, and is also responsible for at least 12% of cancer of the oropharynx, and 3% of cancer of the mouth. It is well documented that HPV types 16 and 18 could cause 70% of the cases of cancer of the cervix globally (WHO, 2007).

The HPV is a sexually transmitted infection. However, penetrative sex might not be a necessary factor for its transmission, but could be transmitted by skin-to -skin contact. Many individuals who are sexually active could contract any of the types of HPV at some point in time, but most people get infected soon after becoming sexually active (WHO, 2013a). Evidence suggests that 42.5% of women might report with infections associated with genital HPV during their lives (Gillison et al., 2012; Hariri et al., 2011). The HPVs that are sexually transmitted are categorised into low-risk, high-risk, or oncogenic. The low-risk types such as HPV types 6 and 11 are unable to cause cancer. However, might be associated with 90% of genital warts infections. The high-risk types 16 and 18 cause HPV-related cancers (WHO, 2007).

It takes about 15 to 20 years for an HPV infected person to develop cervical cancer, especially if the individual has normal immune function. In women who are immuno-compromised, for instance HIV-positive women, it could take 5 to 10 years (Denny & Wright, 2009). Meanwhile, the signs and symptoms of HPV infection or cervical cancer are not visible during the early stages of the disease. The symptoms become apparent at the late stages of the disease. These include irregular menstrual cycle, abnormal vaginal bleeding most often after sexual activity, painful sexual intercourse, and offensive vaginal discharge (Al-Darwish et al., 2014; Issah, Maree & Mwinituo, 2011).

HIV, HPV and Cervical Cancer

The HIV attacks and destroys the normal functioning of the immune system, putting infected persons at a higher risk of contracting infections. Within 10-15 years, this can eventually progress to Acquired Immuno-deficiency Syndrome (AIDS), which is the advanced form of the disease in persons infected with HIV. Despite this, progression from HIV to AIDS can be slowed down with effective antiretroviral therapy. HIV is transmitted in several ways including sharing of contaminated needles, transfusion with blood infected with HIV, and mother-to-child transmission during pregnancy, delivery and the period of breastfeeding, but is mostly transmitted through unprotected heterosexual intercourse (WHO, 2014b). The Joint United Nations Programme on HIV/AIDS (UNAIDS) Report of 2013 suggests that, women form 52% of all PLHIV in developing economies, but SSA has the highest proportion (57%) of women living with HIV/AIDS.

It is estimated that 240,000 people are living with HIV/AIDS in Ghana with 120,000 constituting women aged 15 years and above (Ghana Statistical Service [GSS], 2012). In 2012, 12,000 people lost their lives due to HIV/AIDS. HIV/AIDS prevalence in Ghana is 1.37% (GSS). The HIV/AIDS epidemic directly impacts the health and wellbeing of women. Women living with HIV have an increased risk of developing cervical cancer, requiring an urgent need for an expanded access to HIV testing, comprehensive treatment, and availability of sexual and reproductive health services (Choopanya et al., 2013). The much higher incidence of cancer of the cervix among HIV-infected women is related to the high presence of infection with cancer causing types of HPV (Sun et al., 1997; WHO, 2013a). Evidence from a systematic review involving meta-analysis suggests that HIV-positive women have higher chances of developing cervical precancerous lesions and increased likelihoods of cervical cancer (Denslow, Rositch, Firnhaber, Ting & Smith, 2013). Several studies have affirmed that HIV-positive women have greater risk for HPV infection and malignancies associated with HPV including cervical cancer (Clifford, Goncalves & Franceschi, 2006; De Vuyst, Lillo, Broutet & Smith, 2008; Mupepi et al., 2011).

The prevalence of HPV and cervical cancer in HIV-positive women could be due to increased immunosuppression (Denny et al., 2008). A cross-sectional study conducted among HIV-positive women in Kenya identified an association between immunosuppression and high burden of HPV and cervical cancer (De Vuyst et al., 2012). De Vuyst et al. reported that cervical cancer precancerous lesions are high in HIV-positive women. HIV infection creates an

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enabling environment for the progression of cervical precancerous cells to cervical cancer (Kadhel, Multigner, Bardinet, Goerger-Sow & Janky, 2012). The WHO has viewed HIV to be a leading carcinogen (Bouvard et al., 2009). Although there is sufficient evidence to support this assertion in populations with high HIV infection (Holmes et al., 2009; Sitas et al., 2000), other studies observed findings contrary to what was purported by the WHO (Goedert et al., 1998; Massad et al., 2009).

Prevalence of Cervical Cancer

Globally, cancer of the cervix is the most common cancer. It is known that in 2012, 528, 000 new cases of the disease were recorded worldwide. Out of this number, a high proportion (87%) of the cases occurred in less developed economies (International Agency for Research on Cancer [IARC], 2014). Cervical cancer accounted for approximately 12% of all cancers that affect females. The regions considered to be of high risk in age-standardised rates of over 30 per 100, 000 are middle Africa (30.6%), southern Africa (31.5%), Melanesia (33.3%), and Eastern Africa (42.7%). Lowest rates have been observed in Western Asia (4.4%), New Zealand and Australia (5.5%) (IARC).

Cervical cancer is the fourth leading cause of cancer death worldwide (IARC, 2014). In 2012, 266, 000 deaths were recorded globally. This accounted for 7.5% of all cancer deaths in females. Eighty seven percent of deaths due to cancer of the cervix occurred in low-income economies (IARC). In sub-Saharan Africa, the disease accounted for almost 22.2% of all female cancers with high mortality rate in the region (IARC, 2003). In Ghana, cervical cancer is a major cause of death among women, especially those within age group 15 to 44. The

crude incidence rate for cervical malignancy in Ghana is 26.4 per 100,000 per year (GLOBOCAN, 2008).

Magnitude of the Problem of Cervical Cancer

Cervical cancer is a malignant disease affecting women globally. The disease accounted for 7.6 million deaths worldwide (Ferlay et al., 2010). It is estimated that one in every 10 females are diagnosed with cervical malignancy worldwide, but it is more common in SSA and Central America. In resource-constrained countries of the developing world, cervical cancer impacts the health of women since the incidence and death rate are about five to six times higher (Ferlay et al.). The incidence of cancer of the cervix is highest in SSA, accounting for 1% of all adults' mortality and 2% of all mortality that occurs among females. The disease is frequently seen among women in the middle age group, and due to increasing and changing population dynamics, there is a possibility of having more middle aged women in the next 50 years. This might result in four-fold increase in the number of cervical mortality reported among these women (IARC, 2014).

In Ghana, it is estimated that 6.57 million of the Ghana's population are women aged 15 years and above. Women have a higher risk of developing cancer of the cervix (GSS, 2009). Annually, 3,038 women are diagnosed with cervical malignancy and 2,006 die as a result of the disease (MOH, 2011). This is because many women report the condition when the disease has reached an advanced stage, and little could be done in terms of ensuring survival. Though palliative care services are vital in alleviating the pain and suffering such women

encounter, these services are either nonexistent or are poorly developed (Parkin, 2008) worsening the plight of women living with cancer of the cervix.

Efforts in Dealing with Cervical Cancer in Ghana

In Ghana, the strategies employed by the MOH in tackling the problem of cervical cancer are multifaceted. Educational programmes that focus on general and specific awareness-raising about cervical cancer disease, what brings about the disease, clinical manifestations, and effective means of prevention such as safe sex practices and vaccination are being advocated for across the health sector. These include the design of specific health education messages for target population aggregates; women of childbearing age, adolescents, medical, and non-medical professionals. The MOH has adopted health communication messages in the form of radio campaigns, messages on the television, leaflets, and posters in enhancing the education. At the same time, target populations are being reached through opportunistic and organised screening (GHS, 2013).

Additionally, strategies are being put in place to integrate cervical screening into the current health system by incorporating it into reproductive health programmes. Examples of reproductive health services where the integration could be possible are STIs services or family planning programmes (GHS, 2013). Although these strategies could increase screening uptake, there are no concrete policies, programmes, or guidelines to facilitate their implementation (Sankaranarayanan, Budukh & Rajkumar, 2001).

Currently, the Korle-Bu Teaching Hospital in Accra and Komfo Anokye Teaching Hospital in Kumasi have hospital-based cancer registries in Ghana. There is an urgent need for the establishment of a population-based cancer

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registry (Adanu, 2002). This is to ensure that all cancer cases are registered; to gather confidential data on all cancer-related diseases; and to serve as the basis for generating data about the prevalence, incidence, treatment, and survival rates of all people living with cancer in Ghana. This information is vital in health planning, management, and evaluation of programmes (MOH, 2011).

Furthermore, a vaccination programme, HPV Gardasil vaccine, was implemented in 2013 in Ghana to vaccinate girls in grades 4 or 5 who were within the age group 9 to 11 years in government schools in 13 districts in the Central and Northern Regions. The girls received the vaccine three times within a period of six months for complete protection from cervical cancer. Vaccination is known to be the most effective way of preventing cervical cancer. The MOH is in the process of introducing regular vaccination programme to vaccinate all girls 9 to 13 years of age with an approved HPV vaccine. Catch up immunisations would be provided for girls aged 15-18 years. In addition, there are plans to integrate HPV vaccination into the national immunisation programme. This would be funded by the health care system (GHS, 2013).

Overview of the Health Care System in Ghana

The health care system in Ghana has evolved gradually with a unique historical, cultural and political background. The health system is an important determinant of the health status of the people in the country. Primarily, health systems are organised to meet the health needs of the society. Roemer (1993) stated that a health system could be explained in terms of organisation of programmes, productive resources, economic support mechanisms, management methods, and service delivery. Ghana's health system is structured to have a

typical top-bottom approach where policies are formulated by the MOH and implemented by the GHS. The GHS is organised at regional, district, sub-district, and community levels. It is responsible for providing health services to all the people in the country. The private sector including those for profit and not- for-profit also assists, with the provision of health services. Approximately, 60% of health delivery services provided in the country is carried out by the GHS (MOH, 2004).

The GHS provides both curative and preventive health services. The curative services are carried out in health facilities across the country. The preventive health services extend from the health facilities to the community level. In the hospital environment, aside the routine health education offered by health professionals, public health nurses located in public health units within the hospital are mandated to provide services in connection with prevention of diseases such as cervical cancer and HIV/AIDS. These services include counseling, health education, immunisation, family planning, and treatment of minor ailments. The community health nurses carry out the same services in both major and minor health facilities in Ghana. In some hospitals, midwives, doctors, and public health nurses have been trained to conduct Pap test and VIA. These are the two most popular cervical screening tests performed in Ghana (GHS, 2013).

Currently, traditional medicine has been incorporated into Ghana's health system. Some selected district hospitals across the country now have traditional medical practitioners who are responsible for providing health services to people who might prefer alternative medicine (MOH, 2004).

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Treatment of Cervical Cancer

Treatment of cervical cancer is necessary in ensuring the survival and wellbeing of the client. When treatment is initiated early, cervical cancer can be cured. There are various treatment modalities for cervical cancer. Globally, four treatments are currently being used: surgical intervention, radiation therapy, chemotherapy, and targeted therapy (National Cancer Institute, 2015).

Surgical intervention is carried out to remove cancerous tissues. It is used to treat cancer of the cervix. There are various forms of surgical procedures that are performed to manage cervical cancer. A cone biopsy, also known as conisation, can be used to either diagnose or treat cervical cancer. This can be achieved in the form of cold-knife conisation where a scapel blade or sharp knife is used to remove the cancerous cells (Cancer Research UK, 2015).

An equally important method is the Loop Electrosurgical Excision Procedure (LEEP). This involves the use of electrical current through a wire loop to remove cells that are abnormal or cancer (National Cancer Institute, 2015). LEEP is the most appropriate technology for managing precancerous lesions (Cancer Research UK, 2015). In resource poor settings, WHO guidelines highlight cryotherapy (WHO, 2013a). Cryotherapy is a treatment procedure for cervical cancer which is effective in treating precancerous lesions (WHO). It can be performed by a trained midwife, nurse or a competent physician in a single visit. Several studies (Chamot, Kristensen, Stringer & Mwanahamuntu, 2010; Jacob, Broekhuizen, Castro & Sellors, 2005; Sellors et al., 2003; Tseng, Bastu & Gungor-Ugurlucan, 2012) have reported less adverse effects for cryotherapy when conducted by competent personnel. It could cure about 85% of cervical

cancer lesions (Chamot et al.; Jacob et al.). Wesley, Muwonge, Sauvaget, Thara and Sankaranarayanan (2013) affirmed that trained health care providers in the middle-level category can perform cryotherapy, especially in primary healthcare facilities in resource-constrained settings, which might expand access to treatment of precancerous lesions.

In addition, laser surgery is done to remove surface cancerous tissues. Total hysterectomy or removal of the uterus and cervix can also be an option. Depending on the degree of invasion of the cancer to surrounding tissues, other surgical procedures are performed to remove the cervix, ovaries, fallopian tubes, bladder, colon, and rectum (National Cancer Institute, 2015). Nonetheless, cervical cancer surgery might result in complications, including formation of blood clots in the veins of the legs, damage to nearby organs, urinary incontinence, infection, and haemorrhage (North Adelaide Oncology, n.d).

Radiation therapy in cancer treatment requires the use of high-energy x-rays to stop the growth of cancer cells or kill them. Radiation therapy could be external or internal. The external therapy uses radiations that are outside the body to destroy some targeted cancer cells. The internal therapy entails the use of a radioactive substance which is sealed in wires, needles, and sometimes catheters place into where the cancer is situated. The type and stage of cancer determine the way in which the radiation therapy is administered (National Cancer Institute, 2015). Although radiation therapy could be harmful to the body, a 3-dimensional (3-D) radiation therapy or intensity-modulated radiation therapy is designed to destroy cancer cells from many angles. This is known to cause less damage to surrounding normal tissues. Due to an improvement in medical

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technology, radiation therapy could have minimal, or no side effects. In some situations, however, the side effects of radiation therapy could be severe (Cancer Research UK, 2015).

The American Cancer Society of Clinical Oncology (2015) stated that some side effects of radiation therapy often occur during the second week of treatment. These include fatigue, itching, peeling of the skin, blistering, and dryness, but they resolve after therapy has been completed. Long term effects include the development of secondary cancer. This risk is low compared to the benefits one could derive from treating the primary cancer at the initial stages. The Canadian Cancer Society (2015) explained that fatigue might be caused by anaemia, depression or even poor appetite. The end products of toxic substances released by cancer cells when they break down and die could also explain why cancer clients experience fatigue.

Chemotherapy, a form of cancer treatment involving the use of drugs, is initiated to either prevent cancer cells from developing by destroying them or to stop them from multiplying. Chemotherapy could be administered in two forms. Regional chemotherapy involves the introduction of chemotherapeutic agents into specific areas of the body including the body cavity, organ, cerebrospinal fluid, and abdomen. Systemic chemotherapy introduces drugs directly into the blood stream. The drugs are administered through the muscle, vein or mouth. The choice of either regional or systemic application of the chemotherapeutic agent depends on the stage and type of cancer (National Cancer Institute, 2015).

Chemotherapeutic agents being used currently are Cisplatin, Topotecan Hydrochloride, Blenoxane, Platinol, Bevacizumab, Bleomycin, Hyacamtin, and

Platinol-AQ (National Cancer Institute, 2014). According to Cancer Research-UK (2015), common side effects associated with chemotherapy are fatigue, sore mouth, taste changes, diarrhoea, constipation, impairment of the bone marrow in blood production, hair loss, dry rigid and brittle nails and formation of blood clots in the leg.

In some cases, targeted therapy may be initiated. In this type of treatment, cancer drugs and other therapies are used to identify and destroy specific cancer cells without causing any harm to surrounding healthy tissues. For instance, monoclonal antibody, a form of targeted therapy, is used to detect specific substances on cancer cells or healthy tissues or substances that could facilitate the growth of cancer cells. The antibodies attach themselves to those substances and either destroy the cancer cells, stop them from multiplying or spreading. The monoclonal antibodies are administered by infusion. This medium transports radioactive materials, drugs, and toxins to cancer cells (National Cancer Institute, 2015).

Prevention of Cervical Cancer

Prevention comprises interventions including therapeutic procedures which limit disease progression. Leavell and Clark (1965) proposed three levels of prevention which are useful in promoting the health of the population throughout the life span. These are primary, secondary, and tertiary levels of prevention. Primary prevention focuses on health promotion and specific health protection measures such as vaccination and avoiding exposures to the risk markers. Secondary prevention seeks to identify early the disease and includes early diagnosis and prompt treatment as well as limitation of disability. Tertiary

prevention deals with interventions to effectively restore and rehabilitate individuals to be useful to society (Mandle, 2002).

In relation to cervical cancer prevention, primary and secondary prevention are highly relevant in understanding and averting the occurrence of cervical cancer. Cancer of the cervix is a preventable disease because it has a long duration for the pre-clinical phase and the natural history of the disease is well documented in the literature (Aggarwal, 2014). ACCP (2007) recommended VIA and HPV DNA testing as useful strategies for secondary prevention of cervical cancer. Nonetheless, after the precancerous lesions have been identified with effective cervical screening procedures, there is the need for treatment. Tertiary prevention includes efforts to limit progression of the disease, so that precancerous lesions do not develop into the invasive type and palliative care interventions (Mandle, 2002).

Concept of Cervical Cancer Screening

Cervical cancer screening is defined as the "systematic application of a test to identify cervical abnormalities in an asymptomatic population" (WHO, 2013a, p.6). Cervical cancer mortality in women can be reduced with regular cervical screening, adherence to follow-up visit, and treatment. The higher incidence of cancer of the cervix in HIV-positive women has resulted in screening guidelines that aid in identifying early those with the precancerous lesions. Cervical cancer screening guidelines in women infected with HIV differ from those who are HIV negative. It is recommended that HIV-positive women obtain cervical cancer screening two times during the first year after they have been diagnosed or receiving care for HIV and yearly afterwards (American

College of Obstetricians and Gynaecologists Committee on Practice Bulletins-Gynaecology, 2010).

The American College of Obstetricians and Gynaecologists Committee on Practice Bulletins-Gynaecology (2009) stated that cervical screening needs to commence at age 21, and should be discontinued at age 65 years if the women have had three or more previous negative Pap smears, and if they had no history of cervical abnormalities in the past 10 years. For women, aged 65 years and above, with multiple sexual partners, screening should be continued as stipulated in the screening guidelines (American College of Obstetricians and Gynecologists Committee on Practice Bulletins-Gynaecology).

In Ghana, cervical screening, however, is recommended for women 25 years and above because abnormalities of the cervix due to HPV infections are frequently seen in young women under 25, compared to older women (MOH, 2011). In most young women, such cervical abnormalities go away without any treatment intervention. Therefore, screening women under 25 has several consequences for the young women (MOH). It is well established that a high proportion of young women may test positive for cervical neoplasia and referred for treatments that are not necessary. This includes the removal of cells believed to be infected. The treatment may predispose the young woman to pre-term delivery if she desires to have children (Jakobsson, Gissler, Sainio, Paavonen & Tapper, 2007; Kyrigiou et al., 2006; Noehr, Jensen, Frederiksen, Tabor & Kjaer, 2009; Poon, Savvas, Zamblera, Skyfta & Nicolaides, 2012), and the entire process can result in great anxiety (National Health Service UK, 2014). In addition, constraints within the Ghana's health system may possibly explain why

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cervical screening is recommended for women within 25 years and above. In western countries, especially America, Pap test is recommended for women 21 years and above (American College of Obstetricians and Gynaecologists Committee on Practice Bulletins-Gynaecology, 2009).

Methods of Cervical Cancer Screening

Effective screening strategies may reduce almost 50,000 deaths due to cancer of the cervix (Kerr & Fiander, 2009). Different screening methods are available for detecting cervical cancer. These screening tools may find abnormal cervical changes early before the cells progress into cancer. Routine screening is the most effective way of preventing cancer of the cervix. The various cervical screening methods have specific demands for the health care system. The methods also have different specificity and sensitivity rates in terms of detecting positive and negative cases of cervical cancer. Cervical cancer screening techniques available in the literature are Pap tests, Visual inspection tests, and HPV-DNA tests.

Pap Tests

Pap tests also known as Pap smear screening or Pap cytology identifies precancerous cervical lesions that have the potential of developing into cancer if not managed appropriately (Centres for Disease Control and Prevention [CDC], 2014). Globally, annual mortality due to cancer of the cervix has been decreased by 2% with the introduction of Pap test in 1941 (Conley, 2014). The test is known to be effective in preventing cervical neoplasia when performed at regular intervals, especially in settings where the services provided are of quality and coverage is high. Theoretically, increasing screening coverage can decrease the

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incidence of cervical cancer by approximately 90% (ACCP, 2002). In developed settings, it is required that all women who are sexually active have a Pap test immediately they become sexually active and continue to screen annually or every three years. However, in resource-constrained environments, the majority of women have never had the test. CDC recommended that women aged 21 and 65 years obtain a Pap test (CDC).

Pap test procedure involves an examination of the vagina with the aid of a speculum. Cervical cells are scraped and smeared onto a glass slide which is sent to a medical laboratory for a competent or trained cytologist or cytotecnician to analyse and examine cell classification. The results of the analysis are transmitted to the doctor to be communicated to the client. This process can take several weeks and as a result, some women may end up not receiving the outcome of the test. A test is reported to be normal when there are no cervical abnormalities detected from the analysis or when there is presence of benign changes possibly due to irritation or inflammation. The presence of cervical changes with moderate to severe cell abnormalities shows that the result is abnormal. This might require repeat testing or treatment, especially when cancer is obvious (ACCP, 2002).

In women with abnormal Pap test results, for instance, those with low grade squamous changes, regular Pap testing is carried out until the abnormality disappears. If the abnormalities persist, these women are referred for colposcopy. Additionally, those with moderate and severe cervical abnormalities are also referred for colposcopy. Women with such abnormalities may require treatment

to remove either the cancerous part or destroy it (American College of Obstetricians and Gynaecologists, 2013).

A meta-analysis of cross-sectional studies reported sensitivity rate of Pap test to be 59% and specificity rate of 94% (Chen, Yang, Li, & Li, 2012a). This implies that Pap test can correctly detect a high proportion of women who do not have cervical abnormalities that are linked with cancer. Pap test has several benefits. Aside the high specificity rate, it has demonstrated some success in developed settings, where it has been widely studied and described, as a cost-effective intervention for middle-income economies (ACCP, 2007). In contrast, sensitivity rate within moderate to low suggests a high number of false-negative results. The test demands multiple visits, results are always not readily available, and may not be accurate in post menopausal women (ACCP, 2002).

The accuracy of the test depends on the skills of the service provider and the conditions under which the test were analysed. Pap test requires an infrastructure which might be complex in the area of human resource, equipment and supplies, quality assurance and information systems. Most low-middle income countries lack this essential infrastructure which tends to affect cervical cancer screening programmes. In many countries, Pap tests are not available in primary health care facilities. The few health care facilities who perform the test ask women to pay at the point of receiving a service. Importantly, people who need the test most are often not aware that Pap test can prevent cervical cancer. It is necessary that policy makers identify strategies to improve Pap test uptake or consider other screening approaches (ACCP, 2002).

Visual Inspection Tests

The visual inspection tests can be performed using either Acetic acid or Lugol's iodine. VIA, also known as cervicoscopy or direct visual inspection, is performed with the naked eye. The process can also be achieved using low magnification or gynoscopy. In the case of visual inspection with Lugol's iodine, also called Schiller's test, iodine is used to perform the test in place of the acetic acid. The visual inspection method requires vaginal speculum examination in which the health care practitioner applies 3-5% vinegar or acetic acid to the cervix. Cervical tissues that are abnormal assume colour after the application of acetic acid. The test result is positive when there are well-defined, sharp, white lesions extending to the squamocolumnar junction of the cervix with the presence of warts and leukoplakia. The absence of white lesions, inflammation, and small growth may suggest a negative result. An individual might be suspected of having cervical cancer if there are cauliflower-like lesions and ulceration with bleeding or tendency of bleeding when touched. When visual inspection test is positive, a confirmatory or adjunctive test can be performed and treatment initiated immediately (ACCP, 2002).

VIA is recommended for women who need cervical screening and might not have access to HPV testing and cytology based testing or Pap test (Denny, 2013). Evidence suggests that VIA has sensitivity rate of 67-79% and specificity rate of 49-86%, yet requires less demands on the health system compared to conventional cytology and HPV DNA tests (UNFPA, 2011). The low specificity rate suggests that the test can identify small proportion of women who may not actually have cervical precancerous lesions.

A comparison of VIA and colposcopy results suggests that VIA has sensitivity rate of 85.29% and a specificity rate of 68.75% (Ardahan & Temel, 2011). In Nigeria, Albert, Oguntayo and Samaila (2012) reported sensitivity and specificity rate for VIA to be 60% and 94.4% and that of Pap test was 60% and 100% respectively. This indicates that VIA is an acceptable and valid cervical screening technique that can identify precancerous lesions. Sangwa-Lugoma et al. (2006) argued that VIA performed by doctors and nurses has high sensitivity rate, but less specificity when compared with Pap test. This calls for comprehensive assessment of VIA as a screening test in resource-limited countries. Surprisingly, Ghosh, Gandhi, Kochhar, Zutshi and Batra (2012) reported a sensitivity rate of 100% and a specificity rate of 93.3% among women who had the visual inspection with Lugol's iodine in India. It could be argued that the sample size used in the analysis was too small. This could possibly explain the conclusions drawn from the study.

Huchko et al. (2015) observed that the test characteristics for the general population are consistent with the characteristics found among HIV-positive women in terms of using VIA as a screening tool. This suggests that VIA as a method of cervical screening can be used for women regardless of their HIV status. Nonetheless, in most countries in West Africa, cervical cancer screening is not part of the regular care provided to women with HIV. Horo et al. (2014) observed a higher frequency of women in Côte d'Ivoire with HIV turned out to be positive when screened with the visual inspection method. This implies that incorporating cervical cancer screening into regular HIV programmes may encourage HIV-positive women to screen; thereby, reducing the proportion of

HIV-positive women who fail to follow-up after being diagnosed with cervical cancer or obtaining a positive result for cervical cancer.

VIA is a cost-effective screening tool that can be implemented in many resource-constrained settings. It requires a less complex infrastructure, is easier to sustain, and results can be obtained at a single visit. The test does not require vigorous training and human resources, and can be easily integrated into the primary health care services (ACCP, 2002; Elit, Baigal, Tan & Munkhtaivan, 2006; Ardahan & Temel, 2011). Several authors (Albert et al., 2012; Harshad et al., 2008; Gaffikin, Lauterbach & Blumenthal, 2003) have argued that VIA can lead to a waste of resources with women who may not have the precancerous lesions in a single visit technique. In settings with high prevalence of HIV, there is no convincing evidence pertaining to the cost of over treatment (ACCP, 2002; Gaffikin et al.).

HPV-DNA Testing

The HPV-DNA has been found to be a necessary cause for almost all cases of cervical cancer (Sahasrabudde, Luhn & Wentzensen, 2011). The HPV-DNA testing is an adjunct to cervical cytology. The reporting systems of HPV-DNA test mainly focus on aggregate data that suggest either the presence or absence of the carcinogenic type of HPV (Wright et al., 2004). The HPV-DNA test helps to identify carcinogenic HPV, and has been useful in the management and prevention of cancer of the cervix (Solomon, 2009). Madeddu et al. (2014) explained that initiating HPV-DNA testing in HIV infected women, especially those on highly active antiretroviral therapy, may help in reducing the risk for invasive cervical cancer. This may facilitate timely treatment and follow up care.

The American Cancer Society stated that HPV-DNA testing is an appropriate screening tool in many situations including routine screening for cancer of the cervix. The test can be done in addition to cervical cytology normally for women 30 years and above (Wright et al., 2007). It is recommended that HPV- positive women who are cytology negative have the test every 12 months, but those who are both HPV and cytology negative, the test needs to be done every 3 years. Early triage management of women aged 21 and above and post-menopausal women with cytology results are critical in cervical cancer treatment and follow up care (Saslow et al., 2002; Solomon, 2009; Wright et al.).

The HPV-DNA test can be beneficial to women since it has a high sensitivity rate and a high degree of negative predictive value (ACCP, 2007). The ability of the HPV-DNA test to detect the absence of the carcinogenic type of HPV in women who has been screened suggests a low risk of developing invasive cervical cancer within the next 5-10 years (Dillner et al., 2008). This can facilitate continuing screening and prolongation of screening intervals (Dillner et al.). Several randomised trials have provided evidence supporting the claim that HPV-DNA test has a higher rate of sensitivity when compared with cytology in identifying cervical precancerous lesions (Koliopoulos et al., 2007; Lynge & Rebolj, 2009; Schiffman et al., 2011). Pajtler et al. (2010) reported sensitivity and specificity rate of HPV-DNA test as 69.2% and 63.2% compared to 61.5% and 93% of cytology screening. The specificity rate for HPV-DNA test seems to be lower compared to cytology. This may be due to the fact that most HPV infections do not result in cervical cancer since they can be transient

(Kinney, Stoler & Castle, 2010; Wentzensen, Gravitt, Solomon, Wheeler & Castle, 2009).

Determinants of Cervical Cancer Screening

There are several determinants of health, but basically, health is determined by access to adequate social and economic resources that enable an individual to have sufficient water, shelter, food, and vital resources (Stanhope & Lancaster, 2002). Fundamentally, women have a major role to build society through child bearing and raising the family. At the household level, women ensure that the family has the important resources needed for healthy living, including proper personal and environmental hygiene, food, and potable water (Kwapong, 2008). A majority of women in resource-constrained settings may not possess these resources. Consequently, high proportions of women living in these settings are dying from a preventable disease, cervical cancer, due to the low coverage of screening facilities.

Several factors are responsible for determining screening behaviour among HIV-positive women. Williams-Brennan, Gastaldo, Cole, and Paszat (2012) submitted that structural variables including the socio-economic position, societal values, culture, and ethnicity and intermediary factors such as the type of health system, psychosocial factors, health seeking behaviours, and geographical location are essential factors. Additionally, Lambert (2013) affirmed that HIV-positive women can have cervical cancer depending on their serologic values including CD41T lymphocyte count and the total HIV viral load. Although these factors can be seen among HIV-positive women, they cannot predict screening in isolation, as they interact with other factors to explain screening behaviour.

Education

Education plays a major role in helping people to adopt appropriate health behaviours. The WHO (2012c) stated that health education is a deliberate opportunity for learning that employs communication aimed at improving health literacy. This concept may foster motivation, self efficacy required to carry out a specific action, and communication of information focusing on the underlying environmental, social, and economic conditions affecting health. It considers individual risk factors, risk behaviours, and the use of the health care system (WHO, 1998). The aim of health education is not only to increase knowledge and develop skills, but to enable people to act to address the economic, environmental, and social determinants of health (WHO).

Education is an important social determinant of health. Empirical evidence has found education to be a strong predictor of cervical cancer screening (Abiodun, Olu-Abiodun, Sotunsa & Oluwole, 2014; Choma & Mckeever, 2015; Love & Tanjasiri, 2012). A quasi-experimental study conducted in California to determine the effect of entertainment education on cervical cancer screening behaviour reported no significant differences in knowledge in both the intervention and the control group. Video was used in educating the intervention group while the control group received entertainment education based on a brochure (Love & Tanjasiri). This justifies the importance of both educational strategies in increasing the level of knowledge and attitudes of women. Abiodun et al. affirmed that different media health education programmes may be effective in improving the level of awareness, perception, and knowledge of women about cervical cancer.

A meta-analysis involving 38 RCTs reported that the use of invitation letters has a greater influence in increasing cervical cancer screening uptake, but there was little evidence affirming the claim that educational interventions can improve cervical screening (Everelt, 2011). Nonetheless, conducting one-on-one education and the use of reminders might be effective community level interventions that can improve screening uptake (Griffith, 2013). It is important to mention that the needs of the specific community or population should be considered, in addition to published evidence, when selecting interventions to increase screening rates. The evidence is unclear what type or format of education is effective. It is worth noting that a majority of the studies used in this systematic review were conducted in developed countries. Therefore, its relevance in resource-limited settings is unclear.

A quasi-experimental study reported that women with increased self-efficacy were more likely to request to have Pap test (Figueroa-Muñoz Ledo, Márquez-Serrano, Idrovo, & Allen-Leigh, 2014). It is evident that women having the right information about cervical screening may enable them to adopt early screening practices. A systematic review conducted in the United States found education to be a predictor of cervical screening. The authors recommended the need for targeted education intervention to encourage screening uptake (Limmer, LoBiondo-Wood & Dains, 2014). A hospital-based education study that used leaflets did not find any significant differences in both the intervention and control groups in terms of seeking cervical screening (Straton, Sutherland & Hyndman, 1995).

Wang, Fang, Tan, Liu, and Ma (2010) asserted that community level educational programmes that combine education and techniques of assisting women are vital in several ways. First, the programmes enable women to identify where screening services can be located. Second, some women may overcome the barriers they face with the introduction of free cervical screening services. Although education might be a necessary factor in encouraging women to seek cervical screening, it may not be sufficient in promoting screening, especially among women in resource-limited settings. A holistic approach in understanding the other possible determinants of cervical cancer screening may aid in the design and implementation of culturally sensitive screening programmes. Kahesa et al. (2012) affirmed that culturally accepted programmes in combination with campaigns aimed at raising the level of awareness and knowledge of women about cervical cancer might improve screening pattern.

Socio-cultural Factors

In SSA, women spend more than their counterparts in Europe and America battling with cervical cancer (Parkin et al., 2002). This potentially affects the stability of their social and economic roles, as they might be the bread winners in their families. The factors that might facilitate the spread of HPV infection and subsequent development of cervical cancer are widespread in SSA. These include high parity, early marriages (Palacio-Mejia et al., 2003), and polygamous relationships (Ebu et al., 2014; Mupepi et al., 2011). Polygamy is a risk marker for cervical cancer, and heightens as the number of co-wives increases (GSS, 2009). Also, prostitution contributes substantially to the high

prevalence of HPV within the SSA cultures (Ntekim, 2012; Sangwa-Lugoma et al., 2006).

Socioeconomic Factors

A high proportion of women, approximately 60-70%, who suffers from cervical cancer live in deprived communities (Palacio-Mejia et al., 2003). A majority of these women encounter geographical and financial difficulties. Accordingly, these women go unreported and untreated. Soneji and Fukui (2013) pointed out that recent visits to a medical doctor, age, and education can influence cervical cancer screening. This is because poorest women who embark on recent visits to a health facility had a better likelihood of being screened than those from wealthier backgrounds. Cervical cancer is often associated with disadvantaged women, especially those who are poor. The risk of acquiring cancer of the cervix seems to be higher among women of low socio-economic status (Mupepi et al., 2011).

A study conducted in Mali found high parity, poor personal hygiene, and social conditions to be co-factors in the development of cancer of the cervix (Palacio-Mejia et al., 2003). The situation in some SSA settings supports sub-standard living conditions. For instance, natural disasters, political tensions, internal conflicts, drought, famine, and wars are factors that destabilise the economic and political environment. These crises result in internal and external displacement of large groups of the population for long periods of time. The displacement has its consequences on the people including cohabitation, prostitution, incidence of rape, and multiple marriages. In war situations, males tend to be sexually promiscuous which can result in the risk of HPV infection

and possible development of cancer of the cervix in women in monogamous relationship (Palacio-Mejia et al.).

Status of Women in Ghana

In Ghana, women are not viewed as homogeneous entities. This is owing to the fact that some women have excelled in their respective academic and professional fields. As significant proportion of women might face discrimination in pursuant of their social and professional roles compared to their male counterparts (Maddox, 2013). The conceptual basis for this discrimination can be linked with culture and customs. This may even be complicated by institutional and structural barriers (Abeliwine, 2007).

Despite these barriers, access to health-related resources is critical in maintaining and promoting the health of women. Contrary, millions of women are not in the position to access basic health-related resources (Stanhope & Lancaster, 2002). Data from the GSS (2012) suggest that women in Ghana are living longer than men, but they are generally confronted with more health problems, hence, they appear to be less healthy. The differences in health status can be attributed to poverty. Although over the last decade, women have been striving towards financial equality, there has been slow progress.

Traditionally, women appear to be restricted in their efforts towards equality, as their roles are well defined which stem from cultural and biological lines. Women play a vibrant role in economic development. This is because their roles extend from the home to other sectors of the economy, including agriculture, retail and wholesale businesses. The involvement of women in these sectors may greatly affect the income levels of their households, as well as the

overall health and wellbeing of the family. Inequalities in women's access to sufficient economic resources to be independent and achieve their social and economic aspirations exist. This generally causes women to be disadvantaged compared to men (Amu, 2005). Abeliwine (2007) stated that women do not have the opportunity to participate in decision making. Male dominance over affairs including those issues that affect women, negative perceptions, attitudes, and stereotypes of various forms and degrees can result in disparities which can deprive women of equity and dignity.

Ardayfio-Schandorf (2005) explained that the nature of girlhood can determine the status of women in later life. Several factors potentially deprive women from having high social status. These might have strong traditional and cultural origins. In Ghana, some traditional practices, cultural norms, values, and socialising processes seem to place the female child and women in a low status. For women to be fully integrated into the political and development processes of the country, it is imperative that efforts are put in place to eliminate or reduce situations that militate against the productive, essential and unique roles of Ghanaian women as well as factors that dehumanise them, including all forms of violence against women.

The GSS (2012) affirmed that women are key actors in nation building. They form almost 50% of the active workforce and they are involved in farming and informal sector jobs such as trading which can be either whole-sale or retail. A small proportion of women, (about 1%) is in administrative positions in the public sector. The economic position of Ghanaian women is low, though they form a greater proportion of the population. Women lack the skills of writing

strong business proposals. They also lack access to avenues that can provide comprehensive knowledge and skills, as they might not know the opportunities that exist in their environment due to time constraints. Despite the numerous challenges women encounter, the ability to access training facilities and retraining can enable them to access better economic opportunities and earn more income (Ardayfio-Schandorf, 2005). Archampong (2010) pointed out that the low socio-economic status of women can significantly impact their ability to contribute to decision making processes focusing on policies. Amu (2000) asserted that the low self-esteem, inadequate access to economic and educational opportunities might possibly explain the economic circumstances in which women in Ghana find themselves.

The International Federation of Women Lawyers [FIDA-Ghana] Annual Report (2010) explained that at the secondary and tertiary levels of education, attrition among females is high because of teenage pregnancy. Situations contributing to teenage pregnancy are child neglect, cultural socialisation towards marriage, parental irresponsibility, and low emphasis on education for girls and women. Worldwide, the level of education of women is a necessary factor in predicting the health of women and their families. Educated women may have improved their socio-economic status and a decline in mortality rates (Thomas, 2005). Policies that may improve the livelihoods of women need to be supported since it is known that the financial stability of women can translate into better health outcomes of the family (Stanhope & Lancaster, 2002).

Improving the status of Ghanaian women requires a supportive environment that facilitates education of girls and women. The total population

literacy rate in Ghana is 71.5%, but the proportion of females who are aged 15 years and above and, can read and write is 65.3% (GSS, 2012). Moreover, Article 17 Subsection 4a of the 1992 Constitution of the Republic of Ghana states that "Nothing in this article shall prevent Parliament from enacting laws that are reasonably necessary to provide for the implementation of policies and programmes aimed at redressing social, economic or educational imbalance in the Ghanaian society" (Government of Ghana Constitution, 1992, p. 16).

Therefore, disparities affecting women may be addressed by improving the socio-economic environment. This may help women to be independent, access market information and be productive. Involvement of women in decision making will build their confidence thereby enhancing growth and sustainable development (Badu-Ofosu, 2012). In the same way, the type of marital relationships women engage in can affect their health status. The Marriages Act 1884-1985 and Customary Law provide a framework under which marriages can be contracted in Ghana. Marriages can be contracted under Parts 2 and 3 of the Marriages Act and the customary law. Marriage in the legal sense is a formal agreement between a man and a woman who have accepted to be in a relationship which is associated with some rights, responsibilities, and status. Marriages contracted under the customary law can be viewed as potentially polygamous in nature, as men in such union can marry and legally register more than one wife. This type of marriage is also underpinned by the Divorce Registration Law of 1985 (Provisional National Defence Council [PNDC], 112). However, marriages under the ordinance or common law are monogamous. Marriages can also be contracted under Islamic laws. This type of marriage is

highly polygamous, but for it to be valid, it must be registered under the Marriages Act (Offei, 1998). Polygamous relationship is a common practice in Ghana. It is more common in the Central Region, mostly among the fishing communities (Ghana District, 2012).

Compounding the issue of polygamy is cohabitation which is a popular and equally important practice that impacts the health of women (Ghana District, 2012). Women in such relationships encounter a number of challenges. For instance, since the marriage rites have not been performed, the level of commitment of both men and women might be low. People in such relationships may have a high tendency of engaging in other sexual relationships that could predispose them to STIs including HPV.

HIV Viral Load

The amount of the HIV virus that can be detected in the blood may predict cervical screening among HIV-infected women. Evidence suggests that HIV-positive women with low viral loads are more likely to adhere to screening recommendations and care guidelines (Lambert, 2013). A cohort study conducted by Keiser et al. (2006) indicated that HIV infected women with viral loads less than 400 copies/mL had had fewer Pap tests. Tello et al. (2010) affirmed that a viral load greater or equal to 50 copies/mL was linked with not having Pap test in the previous year. In contrast, Baranoski et al. (2011) found an association between viral load of more than 10,000 copies/mL and not having Pap test in the past 18-months. The evidence that total HIV viral load determines cervical screening is unclear; it seems other important factors contribute in predicting screening behaviour among HIV-positive women.

Cluster of Differentiation 4 Count

The Cluster of Differentiation 4 (CD4) Count is an important indicator of immune function. HIV infection affects the immune system. The immuno-compromised state of HIV infected women can lead to the development of squamous intraepithelial lesions. Once these lesions are established, the CD4 count may not affect the disease progression (Cardillo, Hagan, Abadi & Abadi, 2001). Previous studies reported that women with low CD4 count of 200 copies/ mm³ were less likely to have Pap test or adhere to Pap test (Baranoski et al., 2011; Dal Maso et al., 2010; Oster et al., 2009; Rahangdale et al., 2010). Contrary, Keiser et al. (2006) did not report any significant association between adherence to Pap test and lower CD4 counts. Low CD4 counts means that the immunity system is low and an HIV-infected person may be progressing into AIDS. Hence, the likelihood of developing cervical cancer since it is one of the AIDS associated cancers.

Resources for Cervical Cancer and Screening

Cervical cancer prevention strategies and programmes have been shown to be effective in decreasing the death and morbidity due to cancer of the cervix in developed countries. In developing settings, where there are well organised screening programmes, most of the countries are unable to meet their targets owing to financial and logistical constraints (Bhagwan et al., 2007). A retrospective study conducted by Parish, Swaine, Son and Luken (2013) indicated that when women and-their care givers are educated, and health professionals are given incentives, they will be more willing to work in achieving targets in screening rates. This implies that education alone is not a

means to an end, but other equally important factors need to be considered in any attempts to promote a health-related behaviour. Therefore, increasing health expenditure in infrastructural development and training of health providers in developing settings might be important initiatives in improving cervical cancer screening rates (Akinyemiju, 2012).

In Ghana, the percentage of the healthcare expenditure allocated for cancer care is negligible, despite the increasing burden of cancer (MOH, 2011). The government increasing resources for cancer prevention and control may help in addressing the cancer situation. For instance, efforts should be made by the government and all stakeholders to include cancer drugs and agents on the National Health Insurance Scheme. There is the need for the establishment of an endowment fund to support people living with cancer at the community, district, regional, and national levels (Adanu, 2002; MOH).

Aside the problem of inadequate financial resources, the shortage of skilled and competent human resource including cytologists and cytotechnicians is not helping cervical cancer screening situation in Ghana. In Zimbabwe for instance, inadequate cytotechnicians was an important factor that affected cervical cancer screening utilisation (Chirenje et al., 2001). To add to this is the issue of poor data management due to difficulties in the registration of cancer cases. The lack of trained personnel to manage cancer data is a major factor contributing to this problem. As a result, statistics on cancer in Ghana are based on the few data generated from Komfo Anokye and Korle-Bu Teaching Hospitals' Cancer Registries which might not fully reflect the actual situation. Most of the cancer estimates generated by WHO and IARC on Cancer about

Ghana are based on estimates from neighbouring countries due to the absence of a National Cancer Registry to collate all information related to cancer in Ghana (Adanu, 2002).

Furthermore, cancer is a chronic condition that leads to severe pain and suffering. This calls for the establishment of palliative care services in Ghana. Nonetheless, palliative care seems to be weak in Ghana. In responding to the palliative care needs of people living with cancer, the MOH has adopted these strategies; a multidisciplinary team approach including medical staff, paramedical staff and relatives of the patient. There are plans to decentralise palliative care services to enhance care at the community level. To enhance community care, health staff will be trained to manage the medical, psychological, and psychosocial aspects of cancer care. Essential medications including morphine will be provided at all levels to manage patients effectively. The MOH will collaborate with non-governmental organizations and developmental partners in order to ensure the delivery of quality palliative care services (MOH, 2011).

In addition, the equipment needed for screening is only available in few hospitals across the country. Women may have to travel considerable distance before accessing screening services. In health facilities where screening equipment is available, poor maintenance culture and delays in repairing such equipment worsen the plight of women attempting to obtain either cervical screening or treatment (Adanu, 2002; Chirenje et al., 2001).

Despite the importance of screening and the need for equipment to facilitate it, there is low interest of developmental partners in the area of non-

communicable diseases of which cervical cancer is an example (Adanu, 2002). Most developmental partners are concerned with training, research, and provision of logistics in the management and control of communicable diseases such as HIV/AIDS, Malaria, and Tuberculosis. Meanwhile, non-communicable diseases need equal attention since there seem to be an epidemiologic transition and Ghana is also witnessing more cases of non-communicable diseases. Due to the complexity of the problem of cervical cancer screening, the government alone might not be able to solve the problem. Efforts by all stakeholders, developmental partners, and community leadership to prioritise women's health to the top of the health care agenda are urgently needed. Developmental partners need to rethink and give cervical cancer screening the needed attention and support it just like other maternal and child health programmes (Ebu et al., 2014).

Challenges with Cervical Cancer Screening in Ghana

The difficulties regarding cervical cancer screening in Ghana can be explained by critically examining several underlying factors. Adanu (2002) stated that there is low public awareness about the disease even among medical students. This calls for a review of the curriculum of medical students as well as other health training institutions to include cancer prevention and control strategies to enhance their knowledge and skills. For health professionals who are already practising, in-service training can be organised to facilitate their understanding about cervical cancer, methods of screening, treatment, and the need for follow-up care.

A critical factor that cannot be overlooked is the late reporting of cervical cancer cases. Many women report to the hospital at a time when little can be done to ensure their survival. Inequalities in accessing health services, myths, perceptions of women about gynaecological examination, and infections may explain this phenomenon. While health system factors contribute significantly, the dropout rate in the detection of the disease, treatment, and follow-up on the part of women need to be tackled in any efforts to increase treatment adherence and follow-up care. To add to this, poverty and lack of knowledge have been identified as possible factors leading to non-adherence to referral for screening (GSS, 2012). Even, those diagnosed with the disease, may be unable to obtain treatment services, and those who are able to initiate the treatment, some drop out as a result of poor socio-economic circumstances. Additionally, treatment protocols or guidelines are not well established in health facilities which limit the provision of evidence-based care to women with cervical cancer (Adanu, 2002).

Demographic Factors Influencing Cervical Cancer Screening among HIV-positive Women

The relationship between socio-demographic variables and cervical cancer screening has been explored in several studies (Allen et al., 2014; Benjamins, 2006; Bhagwan et al., 2007; Chen, Kessler, Mori, & Chauhan, 2012b; Leyva, Nguyen, Allen, Taplin & Moser, 2015; Obi et al., 2007). A significant association has been reported between income, age and religion and seeking Pap test in population-based studies (Chen et al.; Elit et al., 2012; Kahesa et al., 2012; Khan & Woolhead, 2015; Modibo et al., 2016; Moser, Patnick & Beral, 2009; Padela et al., 2014; Park, Park, Choi, Jun & Lee, 2011;

Tacken et al., 2007; Wang & Lin, 1996; Were et al., 2011; Yi, 1994). Modibo et al. found religious beliefs of modesty, fear of a negative result, discrimination, and possibility of contracting a nosocomial infection as factors that prevented women from seeking screening. In Dubai, Muslim women had many barriers which negatively affected screening (Khan & Woolhead). This affirmed the findings that Muslim women may be less likely to avail for cervical screening (Padela et al.). Similarly, Salman (2012) reported that cultural and religious beliefs could impact cervical screening behaviour among Arab women.

In a study conducted among Hispanics using conditional process modeling, religiosity significantly determined breast and cervical screening (Leyva et al., 2015). It seems religious beliefs play a major role in influencing health care seeking behaviours of followers of that particular religion. Population-based surveys reported an increase in cervical screening utilisation among women who engaged in religious activities (Allen et al., 2014; Benjamins, 2006). In the United Kingdom, religiosity influenced cervical screening attendance (Ekechi et al., 2014). Similarly, in a study conducted among Nigerian women, being religious determined the choice of cervical screening method (Dareng et al., 2015).

Bhagwan et al. (2007) reported that women who availed for cervical screening were younger (30-39 years), educated, mostly married, and had used contraceptives compared to those who had never gone for the test. It seems intensifying education on cervical cancer for women under 50 years will greatly influence intention to screen, especially in women who do not have intention (Greaney et al., 2014). Chen et al. (2012b), Wang and Lin (1996) and Yi (1994)

affirmed that marital status could be an important determinant of cervical screening. In contrast, marital status was not a determinant of screening in other studies (Hoque, Hoque, & Kader, 2008; Matejic, Vukovic, Pekmezovic, Kesic, & Markovic, 2011).

Several studies have indicated an association between the level of education of women and cervical cancer screening behaviour (Baskaran et al., 2013; McFarland, 2003; Mupepi et al., 2011; Sudenga, Rositch, Otieno & Smith, 2013; Williams et al., 2013). This finding is convincing because Baskaran et al., McFarland, Mupepi et al., and Sudenga et al., used large sample sizes which allows for possible generalisation of the findings. William et al. generated their results through a mixed method approach, and this adds strength to the conclusions derived from the study. As all methods have limitations, biases inherent in a single method might be reduced or even neutralised by combining two or more methods (Creswell, 2009).

Bhagwan et al. (2007) and Kahesa et al. (2012) identified education as an essential factor that enabled women to obtain cervical screening. Bhagwan et al. conducted a randomised controlled trial and all procedures were followed systematically, hence, reducing the possibility of selection bias and enhancing the power of the study as well as its validity. The inferences drawn from such a study could be more convincing, as randomised controlled trials offer greater precision in comparison to other retrospective and observational studies (Solomon, Cavanaugh & Draine, 2009). Hoffmann, Bennett and Del Mar (2009) argued that results obtained from randomised controlled trials might not epitomise real life application.

Despite the evidence supporting the claim that regular cervical screening might decrease cancer of the cervix incidence and mortality (Bhagwan et al., 2007; Mupepi et al., 2011; Were et al., 2011), a high proportion of women has not had cervical screening in sub-Saharan Africa (Adanu et al., 2010; Chen et al., 2012b; Chirenje et al., 2001; Ebu et al., 2014; Elit et al., 2012; Kahesa et al., 2012; Mupepi et al.; Were et al.). Previous studies (Chen et al., 2012b; Lyimo & Beran, 2012; Moser et al., 2009; Wang & Lin, 1996) found a significant relationship between level of education and never having had Pap test.

Park et al. (2011) and Simou, Maniadakis, Pallis, Foundoulakis and Kourlaba (2010) affirmed that the educational status of women, age, health insurance, marital status, use of oral contraceptives, nationality, area of residence, stability of the menstrual cycle, family history of cancer, and body mass index were associated with the reluctance of women to have Pap test in the past three years. Education may enable people to change their health beliefs and notions above health and illness. Therefore, those with no formal education may not access health services and may have poor quality of life (Ihaji, Eze & Ogwuche, 2014). While the level of education seems to be a critical predictor of cervical cancer screening, Chen et al. (2012b) agreed with Simou et al. in affirming that women who did not have health insurance were less likely to seek cervical screening test.

To add to this, being employed and residing in an urban setting were the predictors of cervical screening behaviour in a study conducted by Wang and Lin (1996). Those who had screening in the previous year were employed, and lived in an urban community where screening facilities were available and accessible

(Wang and Lin). Additionally, those who were formally employed were more likely to have intention to screen (Twinomujuni, Nuwaha & Babirye, 2015). In a retrospective analysis of the British Household Panel data for 1992 to 2008, employment influenced likelihood of seeking screening (Labeit, Peinemann, & Kedir, 2013). This was affirmed by Olesen, Butterworth, Jacomb, and Tait (2012). The result, however, differed from that reported by Hoque et al. (2008) and Matejic et al. (2011) in which no association was found between employment status and screening.

There is sufficient evidence for the conceptual premise that inequalities exist in cervical cancer screening, especially among women in resource-limited settings. Robb et al. (2010) for instance, identified ethnic disparities regarding knowledge of cancer of the cervix screening. Chen et al. (2012b) and Moser et al. (2009) pointed out that ethnicity could influence cervical cancer screening pattern. In Korea, evidence suggested that socio-economic disparities affected screening behaviour and women whose household incomes were low coupled with low educational status were less likely to have cervical screening test (Lee et al., 2013). Yi (1994) found women who were users of contraceptives to have higher chances of using screening services despite having low socio-economic status. In addition, women within a high social class had better chances of utilising cervical screening facilities (Obi et al., 2007). Women in high social class may have more financial resources to afford the cost of health care. Again, better financial status predicted screening (Matejic et al., 2011). This suggests that cervical screening uptake may decrease as socio-economic deprivation increases (O'Neil et al., 2009). Yet, Akinyemiju, McDonald and Lantz (2015)

pointed out that ability to afford the cost of cervical screening may not be an important determinant of screening.

Theories and Models of Behaviour Change

Risky behaviours can potentially lead to the spread of diseases, including HIV. Human behaviour may be responsible for 50 % of mortality resulting from 10 major causes of deaths (Ogden, 2004). This implies that health behaviour is an important determinant of longevity, morbidity and mortality, since lifestyle and human behaviour directly affect longevity. Therefore, interventions to promote appropriate health behaviours need to be targeted at the primary prevention stage. In an attempt to enable people to understand, appreciate, and predict health behaviours, health psychologists have developed several models and theories, based on the premise that individuals behave consistent with the way they feel and think.

Theories and models of behaviour change that are rooted in social psychology posit that an individual's behaviour is partly determined by their attitudes. People's level of motivation and beliefs influence their attitude to specific health behaviour and the intention to adopt it. Other important influences on behaviour include instincts, values and social norms in which people are socialised. Health behaviour deals with actions that seek to prevent diseases. Some of these actions can be health-protective in nature including screening and medical check. There is a relationship between an individual's behaviour and his/her health status. Health behaviours play a significant role in determining health and illness (Ogden, 2007). Theories and models of behaviour change may not be able to predict people's behaviour with certainty, the nature and type of

changes in behaviour that might occur or lead to behaviour change. However, they can provide useful information that might inform policy makers and other stakeholders interested in trying to bring the needed change, the issues they need to consider and the likelihood that interventions will be successful.

This review focused on the following theories and models of behaviour change: biopsychosocial model (BPM) (Engel, 2012), HBM (Becker, 1974, Rosenstock, Strecher & Becker, 1988), Protection Motivation Theory (PMT) (Rogers, 1983), and TPB (Azjen & Fishbein, 1985). It showed how these theories and models have been used in behaviour change in different settings including screening behaviour. These are social cognitive theories. The cognitive theorists proposed that the thought patterns of individuals are dynamic, as they socialise with their environment. The dissemination of information in different ways may change individuals thought patterns which can lead to a change in behaviour (Dembo, 1994; Dignam, 1992; Driscoll, 1994).

Biopsychosocial Model of Health

The BPM was earlier proposed in 1977 by George Engel (Engel, 2012). This model is important in conceptualising chronic illness and has been used as a theoretical framework to guide several studies (Gatchel, Peng, Peters, Fuchs & Turk, 2007; Havelka, Lucanin & Lucanin, 2009; Jones, Edwards & Gifford, 2002; Waltzer, 1982). Borrell-Carrió, Suchman and Epstein (2004, p 576) stated that the BPM is a "philosophy of clinical care" or clinical guide that can help in understanding illness, suffering and disease from diverse perspectives. The BPM facilitates one's understanding of the biological, psychological and social factors

that affect the client when examining and delivering treatment, as opposed to the biomedical model which views only the biological aspects of health.

The biological aspects of the BPM include age, gender, ethnicity, genetic, and physiological factors. The psychological aspect considers the unique thoughts, behaviours, feelings, individual risk or predispositions, and the subjective perceptions. The BPM was modified by Hoffman and Driscoll in 2000. Strengths, health and wellbeing were key constructs incorporated into the model, as it initially emphasised disease and deficit (Stanhope & Lancaster, 2002). The model reinforces empowerment which is an added strength. Havelka et al. (2009) explained that the BPM unlike the medical model considers the wider determinants of health including social and psychological variables in addition to the biological factors propagated by the medical model. Hence, the BPM views health from a holistic perspective and draws the attention of clinicians to interdisciplinary approach to delivery patient care. It could be argued that clinicians without adequate knowledge about biopsychosocial factors influencing health might find it challenging applying the constructs to clinical practice (Jones et al., 2002).

Several studies have applied the BPM in explaining anxiety and substance use disorders, understanding the causes, assessment and management of chronic pain, determining pain-associated fear and disability, initiatives for increasing resilience in mental health, and cervical cancer screening (Buckner, Heimberg, Ecker & Vinci, 2013; Gatchel et al., 2007; Loscalzo, Clark and Holland, 2011; Zale, Lange, Fields & Ditre, 2013). The BPM has been applied to cervical cancer research in both advanced and developing settings (Amin, 2008;

King et al., 2010). Loscalzo et al. (2011) used the BPM constructs to implement cancer screening programme in the United States. The study revealed that biopsychosocial screening could be incorporated into outpatient department cancer clinics as part of routine clinical care. The biopsychosocial strategy, however, requires a comprehensive assessment of clients through evaluation of the psychological and other social factors that may be contributing to the client's problems (Westen, 2005). Physicians, however, are overburdened. Therefore, extending their roles to include the psychosocial aspects of care might often be problematic or unrealistic.

Health Belief Model

The HBM is deeply rooted in social psychology. The model was developed in the United States in the 1950s. It was at a time when both the government and private health sectors realised that people were not willing to be screened for tuberculosis and cervical cancer abnormalities, although these tests were either free or available at a lower cost (Stanhope & Lancaster, 2002). The model provides a framework that can facilitate in understanding why some individuals may take appropriate health-related actions to prevent diseases while others fail to adopt measures to protect themselves (Becker, 1974; Stanhope & Lancaster).

The HBM conceptualises health behaviour change as a critical evaluation of the barriers to successfully performing the behaviour as well as the benefits of engaging in a health-related action (Blackwell, 1992). The model posits that perceived susceptibility and seriousness of acquiring a disease can directly influence the way in which an individual perceives the threat of disease which

can determine likelihood of an individual engaging in the recommended health action. Similarly, there is a link between perceptions of effectiveness of the behaviour and the perceived barriers and benefits. Socio-psychological, structural and demographic factors have influence on an individual's perceptions of the disease and the variables that may affect the initiation of health behaviour change. These perceptions include perceived seriousness and susceptibility to the disease, perceived barriers, and benefits of action (Redding, Rossi, Rossi, Velicer & Prochaska, 2000; WHO, 2003). Cues to action refer to health communication programmes, illness from relatives and reminders from health care providers that may encourage people to take an action (Redding et al.). These cues to action potentially influence perceived threat to the disease.

The HBM is useful in evaluating behaviours that may result in disease prevention and elicit information about how clients view their health (Stanhope & Lancaster, 2002). Although the HBM is a western model, it has widely been used to guide several studies that attempt to predict the likelihood of people engaging in preventive health services including; cervical, colorectal, and breast cancer screening; nutrition beliefs; nutrition education; self care; and decision making about mode of delivery (Baqhianimoqha et al., 2013; Hayian, Vakilian, Najabadi, Hosseini & Mizaei, 2011; Kim, Ahn & No, 2012; Loke, Davies & Li, 2015; Mupepi et al., 2011; Naghaspour, Shakerinejad, Lourizadeh, Hajinajaf & Jarvandi, 2014; Tsunematsu, Kawasaki, Masuoka & Kakehashi, 2013; Wong et al., 2013; Yilmaz & Sayin, 2013). Kim et al. reported that perceived benefits of adequate nutrition and perceived barriers to eating good nutrition influenced behavioural intention. The HBM effectively predicted nutrition education in Iran

(Naghaspour et al.), colorectal cancer screening in Singapore (Wong et al.), and cervical cancer screening in Zimbabwe (Mupepi et al.).

The HBM was applied to a case control study to compare self care health behaviours among a group of patients with heart failure. The model proved to be effective in establishing educational interventions (Baqhianimoqha et al., 2013). A meta-analysis of 16 studies on four of the HBM constructs conducted by Harrison, Mullen and Green (1992) reported large effect sizes for cost and perceived benefits constructs in retrospective studies, but smaller effect size for perceived severity in prospective studies. However, there was no homogeneity across the studies which make it difficult to conclude about the predictive validity of the model. Generally, the HBM has weak predictive capability (Harrison et al.; Orji, Vassileva & Mandryk, 2012). The model does not consider the social context of the behaviour as well as the emotional responses of the perception of susceptibility (Stanhope & Lancaster, 2002).

Previous studies measured the HBM constructs on either a four-point or five-point Likert scale (Ben-Natan & Adir, 2009; Jia et al., 2013; Sutton & Rutherford, 2005; Were et al., 2011). Perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, and cues about cervical cancer screening were all measured using a five-point Likert scale type of items (Ebu et al., 2014; Ezechi et al., 2013; Floyd, Prentice-Dunn & Rogers, 2010 ; Fort Makin, Siegler, Ault & Rochat, 2011; Kwok et al., 2011; Leece et al., 2010; Maree & Moitse, 2014; Morema, Atieli, Onyango, Omondi & Ouma, 2014; Mupepi et al., 2011; Nadarynski, Waller, Robb & Marlow, 2012; Sudenga et al., 2013). The five-point scale comprises strongly agree, agree, neutral, disagree and

strongly disagree. The four-point Likert scale consists of strongly agree, agree, disagree and strongly disagree. Participants who selected strongly agree were considered to have a high level of agreement to the construct being measured (Ben-Natan & Adir, 2009; Harrison et al., 1992; Ibekwe, Hoque & Ntuli-Nqcobo, 2010; Kim et al., 2012) and otherwise.

Individual perceptions   Modifying factors   Likelihood of action

Demographic factors e.g age
Structural factor e.g Knowledge
Socio-psychological e.g Personality

Perceived benefits
Verses
Barriers to
behavioural change

Perceived
Susceptibility
Perceived
Seriousness

Perceived threat
of disease

Likelihood of
behavioural change

Cues to action
Education
Symptoms
Media information

Figure 1: Health Belief Model (Becker, 1974)

Protection Motivation Theory

The PMT was propounded by Rogers in 1975 and was extended in 1983 (Boer & Seydel, 1996). It attempts to explain how people react to health communications that employ fear appeals or fear-arousing messages. It shares important features with the HBM and can be viewed as being adapted from the HBM. Protection motivation is defined as the motivation or sense of having a

strong reason to protect oneself from a potential health threat. It also refers to one's intention to choose the required health action. The components of PMT are severity, vulnerability, response efficacy, self efficacy, protection motivation, and protective behaviour. The main factors that determine intention in the model are the concepts of severity and vulnerability which are similar to susceptibility and seriousness in the HBM (Sutton, 2002). Included in the PMT is the concept of response efficacy which focuses on the belief that one can follow recommended effective interventions that may help in reducing threat. Perceived self efficacy is the belief that one can confidently perform the required health action (Bandura, 1977).

Self efficacy implies that if a person has a strong intention, he or she will be motivated to engage in recommended action that will protect him/her from diseases or some conditions. If the person believes that discontinuation of the recommended health action will expose him to health threats, and the outcome can be serious if the disease or condition recurs. People become highly motivated because they perceive the recommended health actions to be effective in decreasing the possibility of experiencing the threat or its severity (Sutton, 2002).

The PMT has been applied as theoretical framework to guide studies that focused on health behaviours, including physical activity, diabetes mellitus, protective behaviours against *Schistosomiasis*, and arm activity after breast surgery (Gaston & Prapavessis, 2014; Lee, Kilbreath, Sullivan, Refshauge & Beith, 2007; Plotnikoff et al., 2010; Xiao et al., 2014). PMT when combined with health action process theory predicted exercise behaviour among pregnant

women in Ontario (Gaston & Prapavessis). In a related study, the PMT effectively explained physical activity engagement among adults with diabetes mellitus (Plotnikoff et al.).

Despite its ability to predict behaviours and behavioural intention in single studies, a systematic review of 20 studies that used PMT as a framework found self efficacy to be an effective construct in predicting and promoting exercise among the general population (Bui, Mullan & McCaffery, 2013). A meta-analysis of 65 PMT studies that focused on over 20 health topics suggested that an increase in self efficacy threat, vulnerability, severity, and response efficacy could enhance adaptive intentions. Nonetheless, as adaptive intentions increase, there is a decrease in response costs as well as maladaptive response rewards. The average overall effect size for the constructs was medium. This highlights the relevance of PMT in individual and community level programmes (Floyd et al., 2010). A previous study did not find any significant effect in driving outcomes and the use of fear appeals (Carey, McDermott & Sarma, 2013).

Theory of Planned Behaviour

The TPB can explain and predict the behaviour of people in specific contexts. This theory was based on the theory of reasoned action (TRA). The TPB tried to address the weaknesses of the original model in dealing with behaviours in which people had limited volitional control (Ajzen, 1991; Ajzen & Fishbein, 1985). The decision to perform or not to perform a particular behaviour lies with the individual. A major component of TPB is individual's intention to carry out a specific behaviour. Behavioural intention is the result or outcome of

several beliefs of the individual. The theory suggests that intention can be viewed as individual's plan to perform an action in the quest of attaining behavioural goals (Ajzen & Madden, 1986).

According to Ajzen and Fishbein (1985), there are three beliefs that predict behavioural intention. First, the individual's attitude towards behaviour is a necessary belief. This involves positive or negative evaluation of specific beliefs and behaviour concerning the outcome of the particular behaviour. The second belief is the subjective norm which considers the beliefs of significant others about the particular behaviour and the individual's readiness or motivation to adhere to such beliefs. The third belief is perceived behavioural control. This consists of the belief that the individual can perform a specific behaviour after having considered internal control factors that may positively influence the behaviour such as abilities, access to information and skills. External control factors include the opportunities available to enable individuals to carry out the behaviour as well as the barriers hindering individuals to successfully perform that behaviour. These factors are linked to the outcome or behaviour as they interact to predict an individual's intention to perform behaviour. The TPB also emphasises a direct relationship between perceived behavioural control and the actual behaviour without considering a mediating variable, the behavioural intention.

Although the TPB is useful in predicting behavioural intention, Egmond and Bruel (2007) argued that, TPB is unable to explain some important health behaviours by the principles the model stipulates. The model does not consider demographic and personality factors that are critical in behaviour change.

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Perceived behavioural control is also a difficult construct to measure, since there is no clear definition of that construct in the model. It can also be criticised that when the time interval between behavioural intent and the actual behavior is prolonged, it is less likely that the individual will engage in the behaviour. Importantly, it does not consider the motives of people, as it assumes they are rational and engage in systematic decisions based on available information (Stanhope & Lancaster, 2002). However, it considers the fact that behaviour may not be under volitional control all the time as well as the effects of past behaviour on present behaviour (Stroebe, 2000). A meta-analysis conducted by Armitage and Conner (2001) and Hardeman et al. (2002) on the effectiveness of the components of the TPB indicated varied results. The findings were inconclusive regarding the ability of the components of the TPB in predicting behaviours.

The TPB has been widely applied to studies of health behaviours in different areas: hygiene beliefs; cervical, colon and breast cancer screening; prenatal screening; diabetes and general health screening (Booth, Norman, Harris & Goyder, 2014; Boudewyns & Paquin, 2011; McEachan, Conner, Taylor & Lawton, 2011; Mtenga, Exavery, Kakoko & Geubbels, 2015; Mupepi et al., 2011; Roncancio, Ward & Fernandez, 2013; White et al., 2015). In Tanzania, Mtenga et al. used the TPB to determine the social cognitive variables that predict voluntary counseling and testing of HIV among married individuals. The TPB was also used to explain young peoples' intention to screen for Clamydia infection in some deprived communities in the United Kingdom. The model explained 43% of the total variance in intention to get screened for Clamydia and

all the variables were found to be significant predictors of intention (Booth et al.) In a study by Boudewyns and Paquin, TPB explained 70% of the total variance in testing intentions of young people towards Clamydia screening.

A meta-analysis of 33 studies that used TPB and TRA constructs reported that, the models could predict intention to obtain screening as well as participating in the actual screening programme. From the results, attitudes had a large effect size while subjective norms and perceived behavioural control had medium effect sizes with intention. The effect size for intention and screening attendance was medium. This suggests the usefulness of the TPB in predicting intention (Cook & French, 2008).
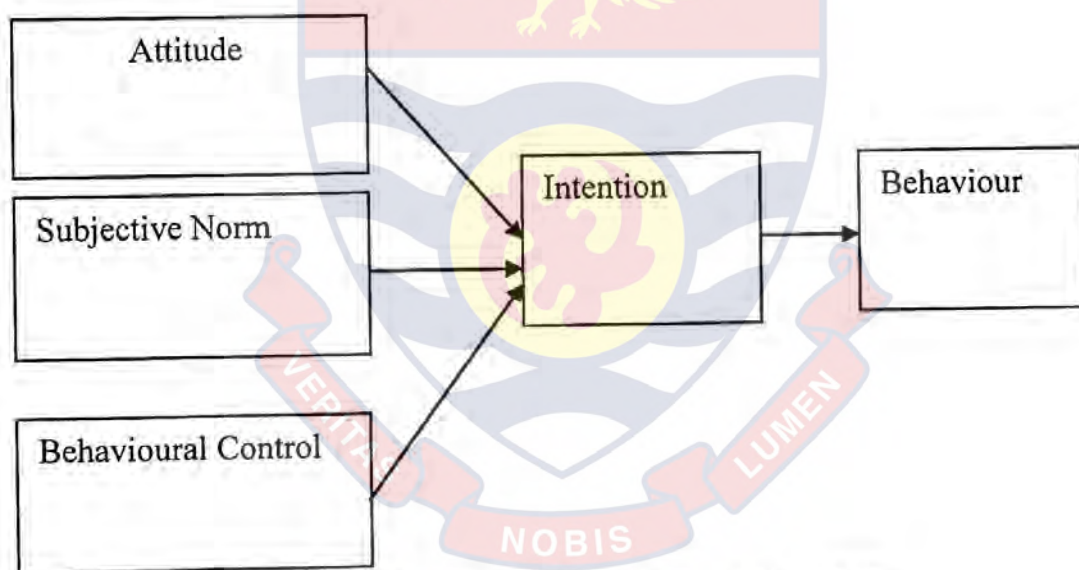
Figure 2: Theory of Planned Behaviour (Ajzen & Fishbein, 1985)

Constructs in the Theory

A theory is a systematic, purposeful, interrelated set of ideas that provides abstract explanation of a phenomenon or some aspect of reality (Polit & Beck, 2004). Kerlinger (1973) defined theory as a set of interrelated propositions, concepts and definitions that systematically explain events or facts by specifying relationships among variables, with the aim of predicting or

explaining facts. In a theory, concepts are put together in a coherent structure to describe or explain an aspect of the world. Theories are necessary in both quantitative and qualitative studies. The building blocks of theories are phenomena, concepts, and constructs. These are mental representation or abstraction inferred from behaviours or situations.

Quantitative studies are guided by a theory, conceptual model or framework to make predictions about how the constructs will behave in the real world if the theory is true. Therefore, deductive reasoning is used to develop from general theory to specific predictions that may be subjected to empirical testing (Polit & Beck, 2004). This study was guided by the following constructs; intention, knowledge, perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, and cues in relation to cervical cancer screening among HIV-positive women.

Intention of HIV-positive Women about Cervical Cancer and Screening

Several studies (Balogun, Odukoya, Oyediran & Ujomu, 2012; Burger, Nygard, Gyrd-Hansen, Moger & Kristiansen, 2014; Dim, Onyedum, Dim & Chukwuka, 2015; Ezechi et al., 2013) have examined intention and cervical cancer screening among HIV infected and non infected women. The willingness of HIV-positive women to avail themselves for cervical screening is critical in cervical cancer prevention. Dim et al. and Ezechi et al. reported that HIV-positive women were willing to have cervical screening as majority of the women were prepared to pay for the Pap test after they had been counseled about it. A significant association was found between the use of invitation letters and intention to take part in cervical screening (Burger et al.). Burger et al.

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conducted this study in an advanced setting where there are well designed structures and programmes for cervical screening. This may explain the conclusions drawn from the study. The applicability of this finding in resource-constrained settings might require further evidence.

A cross-sectional study conducted among young women and adolescent girls reported that previous behaviour and level of knowledge of women and girls were not linked to intention to have another Pap test and possible follow-up (Kahn, Goodman, Slap, Huang & Emans, 2001). In Kenya, although older women and those in marital relationships did not have adequate information about cervical cancer, they had the intent of obtaining cervical screening in the future (Sudenga et al., 2013). This affirmed the findings that women who were 16 years and older may be more likely to avail for screening (Labeit et al., 2013). Conversely, Hoque et al. (2008) found no significant association between age and having Pap test. Ogilvie et al. (2013) indicated that women's intention to participate in screening decreased immensely when the interval was five years and when screening begun after 25 years of age. Rather, the study found that support from male partners increased HIV-positive women's intention to participate in cervical screening (Ogunwale et al., 2016).

Intention has been measured in previous studies on different scales of measurement (Balogun et al., 2012; Dim et al., 2015; Ezechi et al., 2013; Kahn et al., 2001; Ogilvie et al., 2013). Ajzen (2013) measured intention using a seven-point Likert scale, from strongly agree to strongly disagree. Burger et al. (2014) and Kahn et al. used a single item with two options. The variables were dichotomous and therefore measured intention on the nominal scale. Ogilvie et

al. used a seven point Likert scale which ranged from strongly agree to strongly disagree, but the responses were re-categorised into dichotomous variable. Participants who responded greater than four were coded as "intending to screen" and those who responded to four or less as "not intending to screen". A serious weakness with this approach is that dichotomisation may lead to loss of valuable information about individual differences. It can cause havoc in connection with the estimation and interpretation of possible associations among the variables. Nonetheless, correlation and regression procedures without dichotomisation of variables seem to be more appropriate (MacCallum, Zhang, Preacher & Rucker, 2002).

Knowledge of HIV-positive Women about Cervical Cancer and Screening

Several studies (Audu, El-nafaty, Khalil & Otubu, 1999; Bynum et al., 2013; Maree & Moitse, 2014; Lambert et al., 2015; Sichanh et al., 2014) have explored the level of knowledge of HIV-positive women and women whose HIV status was unknown about cervical cancer and its screening. In Tanzania, where the highest burden of cervical cancer has been recorded in East Africa, knowledge about cancer of the cervix increased screening uptake (Plotkin et al., 2014). A cross-sectional case control study conducted in South Africa involving HIV-positive and negative women reported that HIV-positive women had more knowledge about cervical cancer than women without the disease (Maree & Moitse). A logistic regression analysis conducted identified marital status, occupation, level of education, and province, as important factors that influenced knowledge about cervical cancer (Sichanh et al.). The logistic regression model predicted a significant association between having knowledge of cancer of the

cervix and its prevention and screening uptake (Lyimo & Beran, 2012). Chirayil, Thompson and Burney (2014) argued that knowledge of HPV and Pap test screening may not significantly predict screening intention. This is because HIV has been linked with poverty and consequently the socio-psychogical processes of denial and dependency poor women experience are essential factors to consider than perception of sexual behaviour (Ward, 1993). It has been documented that knowledge alone may not be adequate in ensuring behaviour change, as there are other complex factors that equally influence positive behaviours (MacKian, 2003). Similarly, knowledge about risk factors significantly influence intention (Zheng, Saito, Takashashi, Ishibashi & Kai, 2006).

Ogunwale et al. (2016) found cervical cancer knowledge to be low among low-income HIV-positive women, but identified spousal support from male partners and well designed health system, knowledge about the risk as factors that significantly predicted screening uptake. Similarly, knowledge of cervical cancer and Pap test correlated low with intention to screen in the future (Shea, Klainin-Yobas & Mackey, 2013). This could be due to the fact that culturally, women interpret diseases from the spiritual origin to be caused by witchcrafts, sorcery, evil forces or a curse from God (Dako-Gyeke, Aikins, Aryeetey & Mccough, 2013). Rosser et al. (2015) pointed out that HIV-positive women were more likely to have the intention to screen from a district hospital.

Lambert et al. (2015) reported that HIV-positive women lacked knowledge about cervical cancer risk factors and as a result, they may not adopt actions to prevent the disease. Sichanh et al. (2014), however, concluded that

regular consultation in HIV/AIDS treatment facilities may not be enough in providing detailed information about cervical cancer. There is the need to educate women about their high risk nature in contracting the disease. Women may not be adequately informed about the need to avail themselves for cervical cancer screening and prompt treatment of precancerous lesions if they are detected. Therefore, comprehensive education about cervical cancer screening among this vulnerable population is needed.

Although education may be one of the numerous interventions that can aid in a change of behaviour, Bynum et al. (2013) did not find any significant difference in knowledge about cervical cancer or HPV among HIV-infected women with high and those with low health literacy. This suggests that knowledge of a disease condition may not necessarily translate into screening practices. This may pose challenges to any efforts to prevent cancer of the cervix.

Maree and Moitse (2014) affirmed that although more than half of a sample of HIV-positive women had knowledge of Pap test, only few had screening due to fear of the Pap test procedure. When the findings were compared with previous studies, HIV-infected women were more knowledgeable about cancer of the cervix and screening facilities available compared to women whose HIV status was not known. It could be argued that HIV-positive women might have had the opportunity to be educated about cervical cancer and screening since they are more at risk of developing cervical cancer than women with HIV-negative status. Intensifying education about cervical cancer screening will enable women to assess their knowledge and personal risk that might

increase screening uptake (Eze, Umeora, Abuna, Egwuatu & Ejikeme, 2012; Ndikom & Ofi, 2012; Nwankwo, Aniebue, Aguwa, Anarado & Agunwah, 2011).

Several cross-sectional studies conducted in sub-Saharan Africa showed low level of knowledge among women regarding cervical cancer and screening (Ahmed, Sabitu, Idris & Ahmed, 2013; Ebu et al., 2014; Eze et al., 2012; Getahun, Mazengia, Abuhay & Birhanu, 2013; Nwankwo et al., 2011; Mupepi et al., 2011). In Elmina, Ghana, Pap smear screening knowledge was found to be as low as 97.9% of the women reported not to have heard of the test (Ebu et al.). Knowledge and awareness about cancer of the cervix among women may enable them to accept cervical screening and avail themselves for screening (Kahesa et al., 2012). Ahmed et al. and Audu et al. (1999) reported low knowledge about cervical cancer among a sample of Nigerian women. However, Hanisch et al. (2007) in an advanced country indicated high Pap test knowledge among women patronising health facilities in Columbia. These women may have access to information about cervical cancer and screening.

Even though awareness can influence some women to obtain information about cervical screening, a multiple logistic regression conducted in much of the published literature indicated the level of awareness of cervical cancer and the available facilities that offer screening services were low. These variables could not predict screening intention (Eze et al., 2012; Mupepi et al., 2011; Nwankwo et al., 2011). Getahun et al. (2013) however, found cervical cancer screening awareness to be high among a cross-section of Ethiopian women. Though this finding contradicts earlier studies, Getahun et al. conducted the study in an urban community and it is possible that participants might have been exposed to some

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information about cervical cancer. Public education about cervical cancer preventive measures, methods available for detecting the disease, and targeting interventions at the community level by the government and relevant stakeholders may improve cervical cancer screening utilisation (Lyimo & Beran, 2012).

In determining knowledge about cervical cancer and screening, it was essential to examine how this construct was measured, as it would help in identifying the proportion of HIV-positive women who had knowledge about cervical cancer and screening and those who lacked knowledge in previous studies. Although several authors have reported on knowledge about cervical cancer and screening, it was not clear in their methodology how knowledge was measured (Audu et al., 1999; Maree & Moitse (2014). Ahmed et al. (2013), Getahun et al. (2013), and Nwankwo et al. (2011) viewed women who scored 50% or more of the items on the knowledge scale as having knowledge and otherwise. Hislop, Lai, Ralston, Shu and Taylor (2004) and Lyimo and Beran (2012) categorised knowledge as high, medium and low. Knowledge score of 60-100% was high, 50% medium, and below 50% was low. Adageba, Danso, Ankobea, Kolbilla and Opoku (2011) considered high knowledge to be 75% and above while 50% and below constituted poor knowledge.

Hanisch et al. (2007), however, defined level of knowledge of Pap test based on the number of correct responses. Knowledge was categorised as low, medium and high. The Pap test sub-scale had a total of four questions. A participant was said to have high knowledge if she answered three or four questions correctly. Those who answered two of the four questions correctly

were categorised as having medium knowledge and those who answered only one or none were regarded as having low knowledge. This implies that participants who had knowledge scored 75% to 100%. High knowledge of above 75% is necessary for improving the health of the public. For instance, in the area of screening, high knowledge might be important in ensuring that people actually practice it.

Perceived Susceptibility to Cervical Cancer among HIV-positive Women

Risk perception is a significant factor that enables people to adopt health promoting behaviours as emphasised by the HBM and PMT (Gu, Chan, Twinn & Choi, 2012). Perceived susceptibility or perception of risk can be defined as an individual's subjective perception of the risk of developing a health condition (Glanz, Rimer & Lewis, 2002). It is an important behaviour change construct that underpins various theoretical frameworks of behaviour change (Glanz et al.). Perceived susceptibility, as a construct, has been linked with many health behaviours and preventive health actions such as cervical cancer screening (Frank, Swedmark & Grubbs, 2004). Cervical cancer is a disease that greatly impacts the health of women. Perceptions of risk of cervical cancer can be associated with great pain, anxiety, and worry about cancer (Kelly et al., 2015). Several studies have examined the perceived risk of cervical cancer and the intent for screening (Nadarynski et al., 2012; Sudenga et al., 2013; Were et al., 2011). Kadhel et al. (2012) asserted that HIV-positive women who are on treatment and have access to cervical screening services may not be susceptible to cervical cancer. Most HIV-positive women, however, show up for treatment at

the terminal stage of the disease despite their high risk of acquiring cervical cancer.

Aswathy, Quereshi, Kurian and Leelamoni (2012), in a cross-sectional study conducted in India, reported that a majority of women lacked knowledge about the risk factors of cervical cancer and as a result only few women undertook screening. In Kenya, women with high likelihood of being diagnosed with HIV in the past four years felt at risk of developing cervical cancer. They also had the intent of seeking screening services if available, but were less likely to obtain the screening services from a district hospital (Sudenga et al., 2013). Ma et al. (2013) reported that the belief of being at risk increased the likelihood of going for cervical screening. The lack of qualified personnel to provide cervical screening at the district level could be an underlying factor. Other risk factors that increase susceptibility to cervical cancer include multiple sex partners, polygamy, and exposure to sexually transmitted infections (Balogun et al., 2012; Nadarynski et al, 2012; Were et al, 2011). Denny-Smith, Bairan and Page (2006) and Ingledue, Cottrell and Bernard (2004) reported a positive correlation between the number of sexual partners and perceived susceptibility to cervical cancer.

Several studies (Balogun et al., 2012; Nadarynski et al, 2012; Were et al, 2011) have explored the association between having multiple lifetime sex partners and perceived risk for cervical cancer. The WHO (2013b) identified heterosexual contact to be an important risk marker for HPV transmission. Schluterman et al. (2013) explained that polygamy, income and age may not have any significant association with high risk HPV infection. In Taiwan,

women willing to self-sample for HPV perceived themselves to be at risk (Chen, Hsieh, Chou & Tzeng, 2014). Chen et al. used a descriptive cross-sectional survey design and employed convenience sampling method. Therefore, the results need to be interpreted with caution.

Previous studies found perception of susceptibility to be a strong predictor of intention and screening (Ben-Natan & Kutygaro, 2014; Williams, Moneyham, Kemf, Chamot & Scarinci, 2015). However, Were et al. (2011) found perception of risk of cervical cancer to be low in women who considered themselves to be at low risk and had information about the risk factors. It seems reasonable to assume that availability of risk factor information is necessary in decreasing cervical cancer risk perception (Nadarynski et al., 2012). Evidence suggests that women who knew that failure to have Pap test was a risk marker for cervical cancer were more likely to engage in routine screening, but no relationship was found in screening patterns for those with more knowledge about risk factors for cancer of the cervix (Tracy, Schluterman, & Greenberg, 2013; Gu et al, 2012). Garces-Palacio and Scarinci (2012) and Gu et al. (2012) reported that majority of women viewed themselves to be at low risk of cancer of the cervix.

Nonetheless, some women may generally have the perception of being susceptible (Garces-Palacio & Scarinci, 2012). Gu et al. stated that women who availed themselves for the test, had children, were knowledgeable about the disease, and had the perception of routinely visiting their doctors. The factors identified to be associated with perceived susceptibility included the likelihood of previous exposure to a sexually transmitted infection, level of education,

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having thoughts of being at risk of HPV presently, having obtained Pap test the previous year, and having a family member or relative diagnosed with cervical cancer. Perception of susceptibility was highly associated with present or previous perception of exposure to HPV or other sexually transmitted infections (Garces-Palacio & Scarinci). Twinomujuni et al. (2015) reported that intention to have screening was high among the respondents at risk of developing cervical cancer. However, in a study conducted by Ogunwale et al. (2016), unwillingness to have cervical screening was related to lack of symptoms of the disease.

In the same way, a secondary data analysis of Korean National Cancer Survey data guided by the stages of change model showed that women in the action or maintenance stage worried more about developing breast cancer which also influenced intention to screen (Choi et al., 2015). Similarly, a qualitative study that explored the socio-psychological effects of HPV testing found worry about cervical cancer to be an identifiable theme that facilitated intention to screen (McCaffery, Waller, Nazroo & Wardle, 2006). However, an experimental study conducted in the United Kingdom by Hall, French and Marteau (2009) found no significant relationship between worry about cervical cancer and intention to cease smoking. Burger et al. (2014) affirmed that being quite or very worried was not a determinant of intention to screen in Noeweigian women.

Perceived Seriousness of Cervical Cancer among HIV-positive Women

Perceived severity or seriousness of a health-related condition might enable individuals to take actions that would promote their health. Focus group discussions conducted among women in rural Ethiopia suggested that women perceived cervical cancer to be a serious disease (Birhanu et al., 2012). In

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contrast, Ingledue et al. (2004) identified low level of perceived severity about HPV and cancer of the cervix among college students in the United States. Similarly, Ingledue et al. did not find any relationship between cervical cancer HPV severity and condom use when Pearson correlation was performed. Additionally, the results of ANOVA demonstrated no mean differences between women with the history of having had Pap smear in the past, those that had Pap smear in recent times, and those who had never been screened for cervical cancer.

A study conducted by Hoque, Ibekwe and Ntuli-Nqcobo (2009) reported no significant relationship between perceived seriousness of cervical cancer and screening, but significant association was found between monthly income, residence, and perceived severity of cancer of the cervix. Meanwhile, Botswana is an area in Southern Africa, worse affected by the HIV epidermic (UNAIDS, 2008). A secondary data analysis conducted by Shi, Kanouse, Baldwin and Kim (2012) reported that perception of seriousness did not determine HIV testing in Los Angeles. Katz, Tatum, Degraffinreid, Dickinson and Paskett (2007) stated that women who had ever suffered from a sexually transmitted disease, had multiple sexual partners and a sexual relationship before 18 years of age were more likely to have participated in cervical screening.

In young people, their perception of severity could be heightened to the extent that it may serve as deterrent to seeking care (Cunningham, Kerrigan, Pillay & Ellen, 2005). The consequences of not having Pap smear and knowing someone with the disease were associated with cervical screening among Jamican women (Ncube, Bey, Knight, Bessler & Jolly, 2015). A previous study

that combined constructs from the HBM and TPB reported that perception of seriousness was a predictor of intention (Ben-Natan & Kutygaro, 2014). Similarly, increased perceived severity predicted cervical screening (Ho et al., 2005). Morema et al. (2014) found perception of seriousness to significantly influence likelihood of screening ($p = 0.001$). This suggests the need for HIV-positive women to be supported by creating a condusive environment to facilitate access to screening services. There is the need for HIV-positive women to be motivated as high internal motivation has been associated with adherence to therapeutic regimen (Holstad, Spangler, Higgins, Dalmida & Sharma, 2016).

Perceived Benefits of Cervical Cancer Screening among HIV-positive Women

Women may engage in health behaviours if they deem them to be beneficial to their health. A systematic review and meta-analysis that included 24 empirical studies concluded that, cervical screening is essential to women, as it offers substantial protective benefits. The test can result in decreasing incidence of cervical cancer and the mortality associated with it (Peirson, Fitzpatrick, Lewis, Ciliska & Warren, 2013). Ben-Natan and Adir (2009) opined that, awareness about the perceived benefits, risk, and being motivated about general health conditions affected women's intention to seek cervical screening test. Ibekwe et al. (2010) reported that, women viewed cervical screening to be necessary, as it could identify cervical changes early before it progressed into cancer.

Ibekwe et al. (2010) and Tung (2010) affirmed that, the screening test might facilitate early treatment and possible cure due to early detection of

cervical abnormalities. Tung conducted a cross-sectional study among Vietnamese American women, using snowball sampling technique. A serious weakness of this study, however, was the use of non-probability sampling technique which limits the ability of the results to be generalised. While the advantages of cervical screening far outweigh the potential harm, a majority of women lacked information about the benefits of screening and wanted this vital information before participating in any cervical screening tests (Dieng, Trevena, Turner, Wadolowski & McCaffery, 2013). A cross-sectional study conducted by Luszczynska, Durawa, Scholz and Knoll (2012) indicated that a significant relationship existed between perception of benefits and use of cervical screening facilities in Poland. Ben-Natan and Kutygaro (2014) affirmed this finding as perception of benefits predicted intention to screen. Again, lower perception of the barriers led to higher perception of the benefits (Zheng et al., 2006). However, Ibekwe et al. reported that perceived benefits of engaging in cervical cancer screening may not be a strong predictor of cervical screening.

Perceived Barriers to Cervical Cancer Screening among HIV-positive Women

Much has recently been published on perceived barriers to cervical cancer screening (Agurto, Bishop, Sanchez, Betancourt & Robles, 2004; Baskaran et al., 2013; Ebu et al., 2014; Ibekwe et al., 2010; Maar et al., 2013; Markovic, Kesic, Topic & Matejic, 2005; Mupepi, et al., 2011; Williams et al., 2013). A qualitative study using in-depth interviews and focus group discussions identified several barriers. These included inadequate health care providers, transportation and geographic challenges, socio-economic disparities, health

literacy, and colonial legacy as factors impacting screening uptake (Maar et al.). Markovic et al. and Williams et al. identified social barriers including gender roles, socio-cultural health beliefs, lack of client-friendly health services, and personal factors. These findings suggested the need for improvement of the social, economic and political environment by government and all stakeholders with special focus on maternal health. Cervical cancer screening programmes need to be designed to be culturally relevant for women to fully participate in screening interventions.

A study conducted among a cross-section of Ghanaian women with cancer and those without the disease to identify their perceptions of barriers to cervical screening reported lack of knowledge about the disease, misconceptions and myths about the screening, cultural taboos in relation to the gender of the health care provider, lack of spousal support, and stigmatisation of women diagnosed with cervical cancer (Willams et al., 2013). It is asserted that cultural beliefs or myths held by some women that cancer of the cervix cannot be prevented deters potentially high risk women from obtaining screening services (Hyacinth, Adekeye, Ibeh & Osoba, 2012; Kwok, White & Roydhouse, 2011).

Sutton and Rutherford (2005) asserted that, screening can be determined by several factors; the gender of the service provider, discomfort and embarrassment with the procedure, trust, and unavailability of test materials which may deprive women from taking appropriate health promoting actions. In the United Kingdom, a qualitative study conducted suggested that, women had negative feelings of fear, being stigmatised, and embarrassment about cervical screening (Logan & Mcilfatrick, 2011). Although this study was conducted in a

developed setting, the findings have important implications for cervical screening programmes in developing countries. To add to that, in Uganda, feelings of embarrassment deterred women from participating in cervical screening (Teng et al., 2014). Again, Marlow, Waller and Wardle (2015) identified embarrassment as an emotional factor that hindered cervical screening.

Were et al. (2011) explained that, stigma and misconceptions relating to female gynaecological examinations including socioeconomic inequalities; technical and organizational inefficiencies in delivering screening services; and lack of priorities, policies and guidelines on the part of government could affect cervical screening behaviour. In sub-Saharan cultures, cultural and religious factors surrounding pelvic examinations may inhibit cervical cancer screening utilisation (Grewal, Bottorff & Balneaves, 2004; Hislop et al., 2004).

Descriptive cross-sectional studies conducted in Nigeria reported illiteracy, inadequate financial resources, belief that one is not susceptible, and fear of obtaining positive results as factors that discouraged women from participating in cervical screening activities (Ezem, 2007; Ndikom & Ofi, 2012; Oche, Kaoje, Gana & Ango, 2013; Were et al., 2011). Basu et al. (2006) and Ezem explained that women may not see the essence of engaging in cervical screening. Women's inability to participate in screening could be linked with several factors, including long waiting times at the health facility, unfavourable time for examination, recent visit to a gynaecologist, and fear of offering Pap smear (Kivistik, Lang, Baili, Anltila & Veerus, 2011).

Psychosocial factors such as fear of the procedure and general lack of interest about the test can affect Pap smear screening behaviour (Aswathy et al.,

2012). Time and finances also contribute significantly to cervical screening pattern in women from diverse backgrounds (Aswathy et al.). Logan and Mcilfatrick (2011) affirmed that, the time to schedule an appointment and having someone to manage other social roles, for instance child care, could possibly prevent women from participating in cervical screening. Al-Naggar, Low and Isa (2010) and Jia et al. (2013) asserted that anxiety as a result of cancer diagnosis and outcome of the test could deter women from seeking cervical screening. Principal component analysis conducted by Ebu et al. (2014) and Mupepi et al. (2011) indicated that women perceiving themselves as not having any medical problems was an important personal barrier to cervical screening. It is therefore recommended that, cervical screening services should be made available and accessible to women, especially those who are highly vulnerable to reduce the incidence of cervical cancer (Lyimo & Beran, 2012; Ndikom & Ofi, 2012; Nwankwo et al., 2011).

Empirical evidence suggest that inadequate awareness about cervical cancer, high cost, difficult scheduling time for procedure, and unavailability of screening sites are potential barriers to cervical screening (Beining, 2012; Eze et al., 2012; Sutton & Rutherford, 2005; Thippeveeranna, Mohan, Singh & Singh, 2013). The lack of awareness about cervical cancer and unavailability of screening facilities in most sub-Saharan African countries may pose a challenge to the advancement of women's reproductive health issues (Ebu et al., 2014; Eze et al. ; Ezem, 2007; Hyacinth et al., 2012; Mupepi et al., 2011). In situations where screening facilities are accessible and available, it has been observed that women without symptoms are less likely to seek screening services. In Uganda,

perceived low susceptibility was cited as a barrier to screening (Mutyaba, Mmiro & Weiderpass, 2006). Major barriers to seeking preventative screening reported as in Malawi included low knowledge levels, low perceived susceptibility and low perceived benefits of screening (Fort et al., 2011). In Northern Ethiopia however, women with no perceived barriers to cervical screening were two times more likely to avail for cervical screening (Bayu, Berhe, Mulat, & Alemu, 2016). Again, the absence of the barriers predicted intention in a previous study (Ho et al., 2005).

A high proportion of women in SSA receive treatment at the terminal stage of the disease, where managing it with local technology becomes problematic and rate of survival is low (Beining, 2012; WHO, 2012a; WHO, 2013a). This is because health care seeking among women in resource-constrained settings seems to have followed the clinical model of health, where individuals avail themselves for treatment only when there are conspicuous signs and symptoms of the disease (Mandle, 2002). A systematic review conducted by Bukowska-Durawa and Luszczynska (2014) suggested that lower perception of the barriers significantly predicted cervical cancer screening utilisation. This review involved 43 correlational and 5 experimental studies conducted in Australian, North American and European continents.

Cues Influencing HIV-Positive Women to Seek Cervical Cancer Screening

Fort et al. (2011) stated that the process of supporting women to avail for screening and adverts about cervical screening may increase usage of screening facilities and reduce avoidable deaths due to the disease. Screening recommendations from doctors, knowing where to obtain the test and knowing

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someone who had the test strongly predicted screening in rural Uganda (Matejic et al., 2011; Ndejjo, Mukama, Musabyimana & Musoke, 2016). Abotchie and Shokar (2009) reported that among Ghanaian women, only few had recommendations from healthcare providers, had heard information regarding cervical cancer on the mass media, and social gatherings including the church. In a study conducted in South Africa, Maree and Moitse (2014) affirmed that HIV-positive women who participated in cervical cancer screening had information from doctors and nurses. Those who had access to primary care providers were more likely to undergo cervical screening as compared to those who did not have or had limited access to service providers (Leece et al., 2010). Morema et al. (2014) pointed out that women who patronised child welfare clinic services had better chances of being screened. Recent diagnosis of HIV, level of education and awareness about cancer of the cervix forced some women to have the test in Nigeria (Ezechi et al., 2013). Similarly, cues to seeking Pap test, perception of others' beliefs and personal beliefs were linked with cervical cancer screening intention (Kahn et al., 2001).

Several factors may prompt women to obtain cervical screening. Obeidat, Amarin and Alzaghal (2012) and Yi (1994) reported that women could participate in screening as part of scheduled visits to meet their physicians and gynaecologists. Nwankwo et al. (2011) and Obi et al. (2007) argued that most women engage in cervical screening because physicians/doctors refer them for the test. Although referral could be a strategy of increasing screening uptake, Kuroki (2012) indicated that women may avail for health screenings/checkups if paid by employers. Tacken et al. (2007) emphasised that those who viewed

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cervical screening as personal obligation, had reminders and invitations from their personal physicians responded positively by obtaining cervical screening. The doctor's recommendation seems to be a strong predictor of Pap test screening as previously described (Kwok et al., 2011; Tacken et al.). A systematic review conducted by Baron et al. (2008) and Marcus and Crane (1998) concluded that mass media campaigns alone may not be effective in increasing utilisation of cervical cancer screening services but there is the need for resources, organised screening services and policy. Nonetheless, a meta-analysis conducted in the United States on mass media campaigns reported signicant small effect (Snyder et al., 2004). Additionally, the findings of a similar systematic review that included studies conducted in developed settings showed that minimising structural barriers, the use of one-on-one education, reminders by health professionals and small media campaigns could significantly increase cervical screening uptake (Brouwers et al., 2011).

The gender of the health care provider can influence the way in which women utilise screening services. In a study conducted among Chinese women, the women returned for repeated screenings in facilities with female Chinese doctors to conduct vaginal examination. This study also highlighted the fact that free cervical screening and frequent letter reminders may encourage women to take appropriate action (Lyimo & Beran, 2012).

Conceptual Framework

The study was conceptualised within the TPB and the HBM (Ajzen & Fishbein, 1985; Becker, 1974). These theories have been widely used in previous studies in conceptualising and explaining the factors influencing cervical cancer

screening among women in general and vulnerable groups such as women who have been infected with HIV/AIDS in most SSA settings (Mupepi et al., 2011; Tsunematsu et al., 2013; Yilmaz & Sayin, 2013). The HBM constructs adopted for this study were; demographic variables, knowledge, perceived susceptibility, seriousness, benefits, barriers, and cues to action. The reason for the adoption was that these constructs attempt to provide detailed explanation as to why some individuals take pragmatic steps to avoid the disease while others fail to adopt those strategies (Stanhope & Lancaster, 2002).

In addition to the HBM constructs, intention was adapted from the TPB. The rationale for the adaptation was that Ajzen and Fishbein (1985) measured intention on a seven-point Likert scale. However, studies that adopted the intention construct of the theory dichotomised the variable at the point of analysis (Burger et al., 2014; Kahn et al., 2001). For this reason, intention was measured on the nominal scale as a dichotomous variable in the present study. The TPB was relevant in explaining how individual's intention predicts the way in which the person behaves toward a health promotion action such as cervical screening. The willingness of a person to engage in cervical cancer screening may be influenced by her intention. People with positive intention about preventive health services will be more likely to utilise available services than those with negative intention. The HBM and TPB constructs were able to explain the factors influencing intention to seek cervical cancer screening by HIV-positive women based on evidence from previous studies (Mupepi et al., 2011; Ben-Natan & Kutygaro, 2014; Sheeran & Orbell, 2000; Yilmaz & Sayin, 2013).

The study hypothesised that more HIV-positive women with moderate to high knowledge about cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low knowledge (Getahun et al., 2013; Kahesa et al., 2012), more HIV-positive women with moderate to high knowledge about cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with low knowledge (Booth et al., 2014; Cook & French, 2008; Gu et al., 2012; Hanisch et al., 2007; Maree & Moitse, 2014; Mtenga et al., 2015; Mupepi et al., 2011; Sichanh et al., 2014; Wong et al., 2013) and more HIV-positive women with high cues about cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with low cues (Abotchie & Shokar, 2009; Fort et al., 2011; Kahn et al., 2001; Kwok et al., 2011; Leece et al., 2010; Lyimo & Beran, 2012; Maree & Moitse, 2014; Morema et al.,2014; Ndejjo et al., 2016; Tacken et al., 2007).

In addition, more HIV-positive women with high perceived seriousness of cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low perceived seriousness (Birhanu et al., 2012; Floyd et al., 2010), more HIV-positive women with high perceived benefits of cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with low perceived benefits (Ben-Natan & Adir, 2009; Harrison et al., 1992; Ibekwe et al., 2010; Kim et al., 2012), more HIV-positive women with low perceived barriers to cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with high perceived barriers (Jia et al., 2013; Sutton & Rutherford, 2005; Were et al., 2011), and

more HIV-positive women with high perceived susceptibility to cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low perceived susceptibility (Floyd et al.; Nadarynski et al., 2012; Sudenga et al., 2013).

Independent variables   Dependent variable
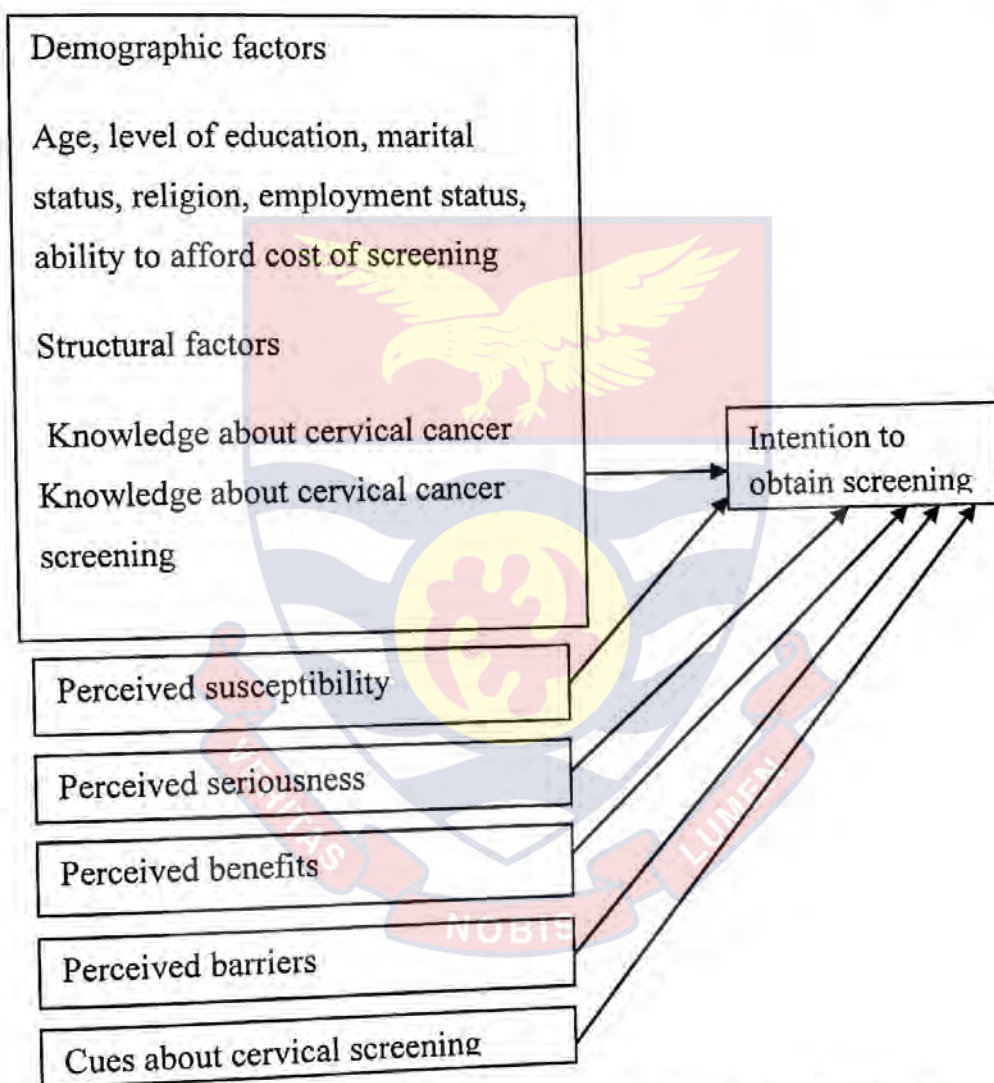
Figure 3: Conceptual framework adapted from the Health Belief Model (Becker, 1974) and Theory of Planned Behaviour (Ajzen & Fishbein, 1985)

It was assumed that more HIV-positive women with low to high level of education (Baskaran et al., 2013; Bhagwan et al., 2007; Ezechi et al., 2013; Kahesa et al., 2012; Mc Farland, 2003; Mupepi et al., 2011; Sichanh et al., 2014; Sudenga et al., 2013; Williams et al., 2013), aged 30 years and above (Bhagwan

et al., 2007; Were et al., 2011), married (Balogun et al., 2012; Elit et al., 2012; Were et al., 2011), employed (Labeit et al., 2013; Olesen et al., 2012; Twinomujuni et al., 2015), Christians (Chen et al. 2012b; Elit et al., 2012; Kahesa et al.; Moser et al., 2009; Park et al., 2011; Tacken et al., 2007), and able to afford the cost of cervical cancer screening (Labeit et al., 2013; Olesen et al., 2012) have the intention to seek cervical cancer screening than HIV-positive women with no formal education, under 30 years of age, not married, unemployed, belong to other religions and unable to afford the cost of cervical cancer screening.

Summary

The literature suggests that cervical screening is an effective intervention in decreasing the mortality and incidence of cancer of the cervix. The review affirms the claim that cervical cancer disproportionately affects women. However, screening uptake among women in resource-limited settings has been low which may be due to several factors. The literature has clearly established the relationship between HIV and cervical cancer and justifies the need for screening among HIV-positive women.

Although knowledge about cervical cancer and screening is critical in the prevention of cervical cancer among HIV-positive women, the evidence in the literature is inconclusive as to whether HIV-positive women have knowledge about cervical cancer and screening. The review points to the fact that HIV-positive women are highly susceptible. This is because their immune system is compromised and thus they are vulnerable to a host of infections including HPV which may lead to the development of cancer of the cervix.

The literature suggested that demographic factors influenced intention. Similarly, perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, and cues about cervical cancer screening can determine intention to obtain screening and subsequent likelihood of going for screening. These constructs have been used in previous studies to determine cervical screening behaviour of women in different settings.

The review has pointed out numerous theoretical and methodological gaps in the literature. Although HBM and TPB have been used to guide previous studies, few studies combined constructs from the model and theory. Many studies have been conducted on cervical cancer screening among women in general in both advanced and resource-constrained settings. However, it seems few studies have been conducted among HIV-positive women, especially in sub-Saharan Africa, despite strong evidence supporting the claim that HIV-positive women are more vulnerable to cervical cancer and the high burden of HIV in sub-Saharan Africa. Evidence about the factors influencing the intention of HIV-positive women to seek cervical cancer screening in Ghana is lacking in the literature. This study seeks to fill in the gap in theory regarding cervical screening by HIV-positive women.

CHAPTER THREE

RESEARCH METHODS

The purpose of the study was to assess the levels of knowledge of HIV-positive women about cervical cancer and screening, determine the extent to which perceived susceptibility, seriousness, benefits, barriers, and cues about cervical cancer screening influence intentions to obtain screening test, and to identify the demographic factors influencing intention of HIV-positive women to seek cervical screening in the Central Region of Ghana. This chapter presents the methods and procedures used in conducting the study. It highlights the research design, population, sample and sampling procedure, instrument, data collection procedures including information on ethical principles that were considered in ensuring that the rights of participants involved in the study were fully protected and methods of analysing the data.

Research Design

The study employed the descriptive cross-sectional survey design. The rationale for selecting this type of design was to describe a phenomenon at one point in time (Ogah, 2013) thereby facilitating an understanding of many existing phenomena in life as they occur in the natural setting. The design was appropriate for this study because the study involved women with a highly sensitive disease and previous studies have suggested a high rate of mortality among this population, especially when such women were involved in longitudinal studies (Hessol et al., 2007; Mupepi et al., 2011). Based on the nature of the problem and the type of hypotheses posed in the study, the design helped in describing the relationships among variables at a fixed point in time to

understand the factors influencing intentions to obtain cervical cancer screening by HIV-positive women in the Central Region of Ghana.

The ontological and epistemological positions of this study are in line with the positivist paradigm which holds that reality is objective (O'Gorman & Macintosh, 2014). Therefore, having reliable knowledge on the factors influencing intentions to obtain cervical cancer screening by HIV-positive women is driven by the positivist assumptions. Positivists believe that all phenomena are invariably subjected to natural laws and for that matter, all behaviour is naturally determined (Bryman, 2008). They also believe that knowledge comes from experience and knowledge from the human senses needs to be demonstrated objectively and all objective phenomena are eventually knowable (Gillis & Jackson, 2002). These ontological and epistemological positions aligned themselves with this research; hence, the study employed quantitative methodology. This approach, according to Bryman operationalises concepts, formulates hypothesis, focuses on facts, test for associations, seeks to predict, generalise, and uses large sample sizes.

Population

The target population for this study was all HIV-positive women in the Central Region of Ghana. This population was estimated to be 6,019 (GHS, 2015). The accessible population was HIV-positive women receiving highly active antiretroviral therapy in the Central Region of Ghana. The data available at the Health Information Unit of the Central Regional Health Directorate suggested that a total of 3,483 women were receiving HIV/AIDS care in health

facilities in the Central Region (GHS). This population consisted of HIV-positive women within 20 to 65 years who were receiving care in the Central Region.

Study Area

The study took place in the Central Region. The Central Region is located in the southern part of Ghana. The region occupies a total land area of 9,826 square kilometres, forming approximately 4.1% of the land area of Ghana. The region has the following boundaries: on the South is the Gulf of Guinea, on the East is Greater Accra Region, West is the Western Region, North is the Ashanti Region, and North-East is the Eastern Region. According to GSS (2012), the population for Central Region is 2,201,863 with 1,050,112 males and 1,151,751 females. This indicated a percentage increase of 38.1 percent in comparison with the 2000 figures. The region comprises 17 administrative districts and has Cape Coast as its capital. The GSS (2009) reported that approximately 63% of the Central Region is rural.

In the Central Region, health facilities are available at the regional, some districts, sub-districts, and community levels. However, four major districts lack access to hospital facilities. They are Upper Denkyira West, Assin South, Gomoa East and Agona West. The Central Region has a total of 295 health facilities comprising 17 quasi-government/mission hospitals, 68 private hospitals, and 210 government hospitals. It has a teaching hospital, Cape Coast Teaching Hospital, which serves as a major referral hospital for the region and other neighbouring towns. The Cape Coast Teaching Hospital, formerly known as the Central Regional Hospital, is the first hospital in the region to have established a clinic for people living with HIV/AIDS. Currently, the National AIDS Commission has established more centres or clinics in the region and the services provided are

known to be highly patronised by people living with HIV/AIDS condition. The private health facilities are mostly concentrated in urban areas. There are 134 functional primary health care facilities/Community-based Health Planning and Services (CHPS) zones. In terms of the distribution of these health facilities, a majority of them are found in urban areas which deprive some rural communities of basic essential health care. Scaling up of CHPS to all communities will aid in addressing the inequity gap in access to health care (GHS, 2015).

Over 90% of the people in the Central Region are Akans and are predominantly Fantes. The region has vibrant tourist attractions such as the Cape Coast Castle, Elmina castle and Kakum National Park. Other festive occasions that attract tourists to the region include the Edina Bakatue Festival which is celebrated by the indigenes of Elmina, Fetu Afahye by the people from Cape Coast, and Aboakyir by the people of Winneba. These festivals and tourist attraction centres have implications for the people in the region. Sexual activity is high in Central Region. The region has been associated with high rates of teenage pregnancy and HIV/AIDS (GSS, 2012). There are differences in the employment status of both men and women. High proportion (76.6%) of women are employed compared to 74.2% of men, compared to national average for both men and women of 74.2% and 74.8%, respectively (Ghana Districts, 2012).

Figure 1: Map of the study area

Source: Department of Geography of the University of Cape Coast (2016)

Sampling Procedure

Charan and Biswas (2013) stated that cross-sectional studies are conducted to estimate a population parameter. Ogah (2013) proposed the following formula for a non experimental design.

Sample size =

$$\sqrt{n} = \sqrt{p(1-p)} \times cl/ci$$

$\sqrt{n}$ = square root of sample size

p = variability or probability = .5

cl = confidence level = 95%

ci = confidence interval = + or - 4%

Sample size = $\sqrt{n} = \sqrt{.5(1-.5)} \times 1.96/.05$

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ci = confidence interval = + or - 4%

Sample size $= \sqrt{n} = \sqrt{.5\,(1-.5)} \times 1.96/.05$

$$0.25 \times 1.96 / .05$$

$$(.5) \times 49$$

$$\sqrt{24.5^2}$$

Sample size   =   600.25

                =   600

Based on the formula above, a sample size of 600 was needed in conducting a study of this nature. This was increased to 660 as it is known that a larger sample size reduces the degree of uncertainty because there would be more information (Bryman, 2008). A simple random sampling technique, specifically, simple balloting with replacement method, was used to select six out of the eleven health facilities responsible for providing care for PLHIV in the Central Region to participate in this study. The selection of six facilities was based on the assumption that when groups are selected from a population, the characteristics of the groups might hover around the population parameters (Ogah, 2013).

This type of sampling offered each facility an equal opportunity to be included in the study, thereby avoiding sampling bias (Robson, 2011). In order to obtain the required number of participants from each facility, the probability proportionate to size sampling was used to determine the proportions from each facility to be included in the sample. This was to obtain a sample representative of the population. Table 1 shows the number of health facilities randomly sampled for this study with the estimated number of participants and number to participate in the study.

Table 1- *Facilities Randomly Selected with Estimated number of HIV- patients and Number that Participated in the Study*

Health facility	No. of Patients	No. per facility
Cape Coast Teaching Hospital	1729	327
Abura Dunkwa Hospital	280	53
Swedru Government Hospital	429	80
Our Lady of Grace, Assikuma	366	70
St. Francis Xavier Hospital	391	74
Saltpond Hospital	288	56
Total	3, 483	660

Source: Field Survey, Ebu Enyan (2016)

Accidental quota sampling was used to select 660 HIV-positive women in the various health facilities participating in the study. This sampling technique was used by involving all members of the accessible population who showed up at HIV/AIDS clinic at the time of data collection and volunteered to participate in the study. Therefore, HIV-positive women within the ages of 20 and 65 were selected until the desired sample size was reached. These women were either married or unmarried. The unmarried women included those who were divorced, widowed and single. As regard their religious status, the respondents were either Christians or Muslims because these are the predominant religious groups in Ghana. Economically, some were working while others belonged to the non-working class. Some were formally educated (with tertiary, secondary or primary levels of education) while others had no formal education. However, HIV-

positive women with dementia, those who were critically ill and were reporting for review were excluded as their responses might confound the results.

Although accidental quota sampling is a non-probability sampling, it can be extremely efficient in situations where random selection might not be practicable (Robson, 2011). It has been used in many hospital based studies (Hailu & Mariam, 2013; Hoque et al., 2009; Ibekwe et al., 2010; Singh & Badaya, 2012; Valerianova, Panayotova, Amati, Baili, EUROCHIP Working Group & ALLEMANI, 2010). It was appropriate for this study, as Lunsford and Lunsford (1995) explained that in the real world of hospital based studies, true random sampling of participants could be problematic or difficult to achieve.

Research Instrument

A questionnaire was used to collect relevant data for the study (see Appendix A). This was adapted from the one used by Mupepi et al. (2011) and Hassani et al. (2014). The adaption of items from Mupepi et al. was important. First, the items were culturally-relevant to the present study. Second, it helped in addressing the hypotheses posed by the study. The instrument by Mupepi et al. was a 39-item questionnaire with Cronbach's reliability coefficient alpha of 0.724 for knowledge about cervical cancer screening. The present study adapted knowledge about cervical cancer and screening, barriers, and cues about cervical cancer screening subscales from Mupepi et al. Evidence of validity of the items for the barriers and cues about cervical cancer screening were determined by factor analysis. Mupepi et al. used the instrument to determine cervical cancer screening behaviour among Zimbabwean women. Ebu et al. (2014) used some

aspects of the instrument to assess knowledge about cervical cancer screening and barriers in an urban community in Ghana.

Hassani et al. (2014) used a 26-item questionnaire. The study adapted the perceived susceptibility, perceived seriousness and perceived benefits subscales from the same. This instrument was developed to determine women's intention to obtain Pap test in Iran and was validated using confirmatory factor analysis. The scales were modified slightly to fit the Ghanaian context. Factors such as "cervical cancer imposes high expenditure on me and my family" and "I'm afraid of thinking about cervical cancer" were modified. These factors were judged to be too technical. Additionally, factors like "many women with cervical cancer may have complications" and "cervical cancer makes life worse" were added. However, all factors were similar to the questions posed on the original instrument. The modifications of the items were necessary to make it more culturally-appropriate to the Ghanaian setting.

Intention to obtain cervical cancer screening was adapted from Ajzen and Fishbein (1985). Ajzen and Fishbein measured intention using a seven point-Likert scale, but most studies that applied it dichotomised it at the point of analysis. Some authors have argued that when the responses of a Likert scale item are more, the validity of the Likert measurement might be compromised because of respondents giving socially-desirable responses (Burns & Grove, 1997; McLeod, 2008; Paulhus, 1984). Consequently, intention of HIV-positive women was measured using 1-item which was dichotomous in nature. Participants who responded "YES" to the question (Do you intend to have cervical screening again or for the first time?), had the intention to have cervical

screening. Participants who responded "NO" did not have any intention to seek cervical screening. This was in line with measures used by Balogun et al. (2012), Burger et al. (2014), Kahn et al. (2001) and Ogilvie et al. (2013).

The selection of measures was guided by the HBM (Becker, 1974) and TPB (Ajzen & Fishbein, 1985) which attempts to explain the category of people who will take appropriate actions to prevent a disease and predict their intention towards preventive health related behaviour. Measures based on these models have been used extensively in assessing cervical cancer screening behaviour among healthy as well as disadvantaged and marginalised population (Balogun et al. 2012; Hyacinth et al., 2012; Mupepi et al., 2011; Nwankwo et al., 2011; Ogunsiji et al., 2013; Robb et al., 2010). Additionally, Ben-Natan and Kutygaro (2014), Ezechi et al. (2013) and Luszczynska et al. (2012) combined the HBM and TPB constructs in determining cervical cancer screening intention.

The questionnaire was designed to determine the knowledge of women about cervical cancer; 10-items were adopted from Mupepi et al. (2011). This included information on the definition of cervical cancer, cervical cancer risk factors, signs and symptoms, and prevention. Knowledge about cervical cancer screening was measured using 5-items from the questionnaire adopted from same. The items included information on the rationale for cervical screening, where it could be obtained, who does the test, and type of specimen required. The responses to the questions on the knowledge about cervical cancer and screening were "Yes", "No" and "Don't Know". For the positive statements on the knowledge scales, each answer correctly identified was assigned a score of one. However, some of the items were negative and therefore had a reverse

score. This meant that those who indicated "No" had it correct. Therefore, "No" was assigned a score of one.

The measures for perceived susceptibility, seriousness, benefits, cues influencing cervical cancer screening, and barriers were guided by the HBM subscales with items from that designed by Hassani et al. (2014) and Mupepi et al. (2011). Hassani et al. and Mupepi et al. used a five-point Likert scale type questions to assess the beliefs of women and how they influenced cervical cancer screening intention. In the present study, perceived susceptibility, seriousness, barriers, benefits, and cues influencing cervical cancer screening were measured on a four point-Likert scale. The use of a four-point Likert scale is highly justified. Garland (1991) explained that social desirability bias, a situation where respondents give answers that put them in good light can be reduced by deleting or eliminating the mid-point from Likert scales. He also argued that maintaining the mid-point can produce some inconsistencies or distortions in the results that one obtains. Dolnicar, Grün, Leisch and Rossiter (2011) affirmed that the use of the four-point Likert scale does not result in loss of predictive validity, but it is easier, simpler and quicker to use. Therefore, the responses to the Likert scale items were strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD). For positive statements, (SA) had a score of 4, (A) = 3, (D) = 2 and (SD) = 1. However, some of the items were negative and therefore had a reverse score.

Previous studies measured HBM constructs using Likert scales (Ebu et al., 2014; Mupepi et al., 2011). In the present study, perceived susceptibility subscale consisted of 8-items, perceived seriousness = 8-items, perceived

benefits = 7-items, cues influencing cervical screening = 5-items, and perceived barriers to cervical screening = 8 -items.

The questionnaire was also designed to identify the demographic characteristics of HIV-positive women. Information about the demographic characteristics was adopted from Mupepi et al. (2011). Mupepi et al. used their instrument to gather demographic factors influencing cervical cancer screening in rural Zimbabwe, an area badly affected by HIV/AIDS. The demographic information used included age, marital status, religion, level of education, employment status and perception of the cost of cervical cancer screening.

The validity and reliability of the instrument were tested. Bryman (2008) referred to validity as the degree to which a particular measure one uses is true to its intended purpose. Face validity and content related validity were ensured as the questions were constructed in line with the hypotheses and the literature review. The questionnaire was given to my supervisor and two independent researchers to confirm its validity. Although face validity seems to be worthless to some researchers (Tappen, 2011), it could be argued that it helped to highlight the real issues that needed to be addressed in the study. All aspects or dimensions of the phenomenon under investigation that needed to be measured were included in the study and efforts made to exclude extraneous dimensions. The instrument was shown to experts in the area of cervical cancer to judge it against the purpose and hypotheses the study sought to answer.

Reliability is concerned with questions of consistency. To achieve internal reliability, a pilot study was conducted to ensure that the questions were appropriate and would be understood by the study participants. The pilot-test was

conducted among 100 HIV-positive women in Effia Nkwanta Hospital, Takoradi, Western Region. This hospital was used because it had a vibrant clinic that catered for people living with HIV/AIDS. Therefore, it was easier identifying participants for the pilot study. Additionally, the people in the Western Region share some features with those in the Central Region in terms of socio-cultural characteristics, and their responses might be similar to that of the actual population.

The pilot test helped to check the adequacy of the questions in terms of wording, clarity, and ambiguity (Bryman, 2008). It facilitated the refining of the questions and ensured they were valid. It also determined the extent to which the data were reliable, and estimated how long one would take in completing the instrument. The pilot study was useful in identifying the type of training the data collectors might require before embarking on the main study (Bryman). Preliminary analysis was conducted to ensure that the type of data collected would answer the hypotheses.

Cronbach's coefficient or alpha of the items for the various subscales was calculated to determine the reliability coefficient, using the population for the main study. Cronbach's alpha is an important indicator of homogeneity of a scale or internal consistency (Bryman, 2008). Nunnally and Bernstein (1994) stated that Cronbach's alpha of 0.70 is acceptable for new measures, demonstrating a modest degree of internal consistency. For established measures used in empirical research, an alpha of 0.80 is anticipated. In clinical evaluation of a specific individual however, an alpha of 0.90 or 0.95 or higher is more desirable. Bryman affirmed that an alpha of 0.70 is acceptable. For items that

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were on the nominal scale or dichotomous, Kuder-Richardson-20 (KR-20) reliability statistics was used to determine the reliability of measurement items. It is known that the closer the value is to one, the better the constructs are related to each other (Bryman). The following Cronbach's alphas or reliability statistics were obtained for the items on the various subscales; knowledge of cervical cancer 10 items = .738, knowledge about cervical cancer screening 5 items = .704, perceived susceptibility 8 items = .824, perceived seriousness 8 = .820, perceived benefits 7 items = .798, cues about cervical cancer screening 5 items = .809, and perceived barriers 8 items = .795.

Data Collection Procedure

Recruitment of participants for the study was conducted at the hospitals, health centres, and by word of mouth. Recruiters were professional public health nurses who had been trained in the care and management of HIV/AIDS patients. These categories of nurses were more likely to have a pleasant attitude, respect, and be courteous to people living with HIV/AIDS. The benefits of participating in the research process to the participant and the entire society were carefully explained to the participants, without providing misleading information or exaggerations about the potential benefits. Participants were told that a summary of the findings would be shared with them if they chose to be recruited for the study.

An interviewer-administered questionnaire was used because the questions were asked orally in a face-to-face interview. The use of this type of instrument was highly relevant. Although Ghana has a female literacy rate of 68.5%, most women cannot read and write. In the Central Region, for instance,

despite it being the stronghold of education in Ghana, evidence suggests that only 137,435 women can read and write in English; only 292,316 in both English and the local dialect, and some 48,364 women understand only the local dialect (GSS, 2012). Additionally, people are more willing to speak to an interviewer who explains the need for the study and solicits their cooperation. With the interviewer-administered questionnaire, there is an increased likelihood of achieving a high response rate of about 80% to 90% (Robson, 2011). Polit and Beck (2004) affirmed that interviews can be used for population groups including the uneducated or illiterate, elderly and the blind. It allows the interviewer to clarify questions that may be confusing or ambiguous, enabling participants to have a better understanding of concepts. In terms of sample control, the interviewer-administered questionnaire will permit the interviewer to interview the intended or right participants. It can also result in the acquisition of additional data mainly through observation. The interviewer can judge the level of understanding of the participants and degree of cooperativeness as well as their psychological state, whether drunk or not. In contrast, the use of interviewer-administered questionnaire may be costly, prevent participants' anonymity and has the risk of interviewer bias (Tappen, 2011).

The independent variables for the study were level of education, marital status, age, employment status, religion, economic ability to afford the cost of cervical cancer screening, knowledge about cervical cancer, knowledge about cervical cancer screening, perceived susceptibility, seriousness, benefits, barriers, and cues about cervical cancer screening. The dependent variable was the intention to obtain cervical cancer screening.

HIV-positive women who met the inclusion criteria were approached. They were interviewed after I had obtained their full consent. Six HIV/AIDS nurse prescribers who could speak both English and Fante or Twi languages and had worked or were currently working with women with HIV were trained to assist with the data collection. It was important to involve data collectors who understood the local language since the study was conducted in an area dominated by Fante and Twi speaking communities. The training covered how they should ask the questions on the instrument. They were told to concentrate on the data collection and avoid distractions such as receiving phone calls while interviewing participants as they might occasionally record wrong answers or options which will consequently lead to the introduction of random error. This was an attempt to ensure inter-rater reliability.

The data were collected on special clinic days designated for caring for people with HIV/AIDS in all the hospitals that were selected for the study. This was to ensure that participants did not incur transportation cost due to this exercise. It took the researcher and assistants 12 days to collect the data at the Cape Coast Teaching Hospital, three days at Abura Dunkwa Hospital, five days at Swedru Government Hospital, seven days at Our Lady of Grace Hospital, Assikuma, five days at St. Francis Xavier Hospital, Assin Fosu, and eight days at Saltpond Government Hospital.

The interviews took place in the counselling rooms in the HIV/AIDS clinics in order to ensure privacy and confidentiality. The instrument was administered in the local language for participants without any formal education. The data collection process took approximately eight weeks, from mid-March to

mid-May, 2016. It was anticipated that all the clients who visit the HIV/AIDS clinic within a health facility would make at least one visit within two months as evidenced by the hospital records (District Health Information Management System [DHIMS, 2014). Therefore, clients who were regular attendants were met during the period of data collection and their consent to partake in the study was sought.

Ethical approval for the study was obtained from the Institutional Review Board of the University of Cape Coast, with identification number (ID NO) UCCIRB/CES/2015/04 (see Appendix B), and from the Ethical Review Committee of the Ghana Health Service, with ID NO: GHS-ERC: 07/01/16 (see Appendix C). Approval was also obtained from the Ethical Review Committee of the Cape Coast Teaching Hospital (see Appendix D) during the proposal development stage of the research. Permission was sought from the Central Regional Health Directorate to use all the HIV/AIDS clinics in the Central Region, which were randomly selected for the study. The nature, purpose and the benefits of the research was explained to the participants. Participants were informed that this research would not cause any physical, social, psychological, economic or legal harm, but they were cautioned that some of the questions might make them feel uncomfortable. Written informed consent was obtained from the participants to ensure that their rights were protected or not infringed upon during the data collection phase of the study (see Appendix E). Participants were told that participation in the study was voluntary and that they were free to stop participating at any stage of the research without offering explanations to

the researcher. The participants were neither exploited nor coerced in any way to take part in the study.

Participants were assured of confidentiality and privacy in relation to the information they volunteered to give. The instrument did not require participants to provide their names and addresses. They were told that they would not be discriminated against or stigmatised as a result of participating in this research. Again, they were assured that the data would be kept under lock and key and destroyed after a period of 10 years. It was explained to participants that the research was being conducted by a competent person and the data collectors, who were professional nurses with a high level of integrity, and were trained to ask relevant questions pertaining to the study. The data collectors signed a confidentiality statement as part of maintaining a high level of ethics in the research process (see Appendix F). Participants suspected of having the condition were counseled, reassured, and referred to an obstetrician gynaecologist in the hospital. In health facilities where there was no obstetrician gynaecologist, participants were referred to the medical doctor for further investigations and management. The management of all the health facilities involved in the study was informed and their support solicited as part of the process of negotiating access to the place.

Data Processing and Analysis

In all, 660 HIV-positive women participated in the study with a 100% questionnaire retrieval rate. Frequencies were tallied and their corresponding percentages computed, and presented in tables. These were done to describe the characteristics of the sample and to examine how the values within the dataset

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were distributed. Binary logistic regression was performed to test all the study's hypotheses and conclusions were drawn at 5% significance level.

A cross-tabulation between the independent and dependent variables was done since the independent variables were categorical in nature and the dependent variable was nominal. The frequencies and percentages were reported in Tables 6, 7, 8 and 9. In addition, all the eight hypotheses were tested using binary logistic regression analysis. This assumes that the dependent variable (y) should be nominal and independent variables (x) are measurement variables or dichotomous. However, assumptions of homogeneity of variance, normality and linearity for the independent variables are not required (McDonald, 2014). Previous studies predicted cervical cancer screening behaviours, using logistic regression model (Fletcher et al., 2014; Getahun et al., 2013; Mupepi et al., 2011; Nwankwo et al., 2011).

Hypothesis one stated that more HIV-positive women with moderate to high knowledge about cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low knowledge. Each correct response to an item on the knowledge about cervical cancer subscale was assigned a score of one, with a total score of 10. The incorrect responses recorded a score of zero. For positive statements on knowledge about cervical cancer subscale, a response of "Yes" was assigned a score of one. However, for the negative statements a reversed score was used. The score demonstrated the opinion of the respondents about the item being measured.

An individual was said to have high knowledge about cervical cancer if she answered correctly 80% or more of the items on the knowledge about

cervical cancer subscale. This meant that a score of 8-10 was considered to be high. A score of 6-7 was considered medium knowledge and 0-5 meant that the person had low knowledge about cervical cancer. These affirmed scores used in previous studies to measure knowledge about cervical cancer (Adageba et al., 2011; Hanisch et al., 2007; Hislop et al., 2004; Lyimo & Beran, 2012).

The independent variable was knowledge about cervical cancer which had three levels of high, moderate and low. The dependent variable was the intention which was a categorical variable and dichotomous in nature. The dependent variable had two levels, Yes and No. Participants who responded "Yes" had the intention to seek cervical screening. Those who responded "No" did not have the intention to obtain cervical cancer screening. This outcome of interest, intention to obtain screening, was coded as 1 and not intending to seek cervical cancer screening coded as 0. The binary logistic regression analysis was performed.

The outputs reported were the beta, Wald statistics, p-value, odds ratios and 95% confidence intervals for the odds ratios (Nicol & Pexman, 2005). Nicol and Pexman and Ofori and Dampson (2011) stated that it was essential for any logistic regression analysis to report this information. The beta value (B) determined the direction of any significant effects. Similarly, when assessing the contribution of individual predictors in the model, the significance of the Wald statistics was examined. Munro (2001) stated that the Wald statistics is used to assess the significance of coefficients. It is the ratio of the square of the regression coefficient to the square of the standard error of the coefficient and is

asymptotically distributed as a Chi-square distribution. The interpretation of the *p*-value is the same in this study.

The study relied on the odds ratios (OR) and 95% confidence intervals for the odds ratio for better appreciation of the dynamics in the results. Thus, the exponential function of beta (e^b) is the odds ratio associated with a one-unit increase in the exposure. Ofori and Dampson (2011) and Munro (2001) stated that if:

1. OR = 1, Exposure does not affect odds of outcome;

2. OR > 1, Exposure associated with higher odds of outcome; and

3. OR < 1, Exposure associated with lower odds of outcome.

The 95% confidence interval (CI) is used to estimate the precision of the OR. A large CI indicates a low level of precision of the OR, whereas a small CI indicates a higher precision of the OR. The binary logistic regression analysis showed that the data supported the null hypothesis for knowledge about cervical cancer.

Hypothesis two stated that more HIV-positive women with moderate to high knowledge about cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with low knowledge. In measuring knowledge about cervical cancer screening, each item correctly identified was assigned a score of one. This was for positive statements on knowledge about cervical cancer screening subscale. However, for the negative statements, a reversed score was used.The total score for this subscale was five. A score of 80% and above was considered to be high knowledge. This meant that a score of 4-5 was considered high knowledge about screening. A score of 3 was

medium knowledge and 0-2 considered low knowledge. Previous studies used similar categorisation and scores to determine knowledge about cervical cancer screening (Adageba et al., 2011; Hanisch et al., 2007; Hislop et al., 2004; Lyimo & Beran, 2012).

The independent variable was knowledge about cervical cancer screening which had three levels of high, moderate and low. The dependent variable was the intention and measured as described in hypothesis one. The binary logistic regression analysis was performed and the results interpreted as described in hypothesis one. The analysis suggested that the data failed to support the null hypothesis for knowledge about cervical cancer screening.

Hypothesis three stated that more HIV-positive women with high cues about cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with low cues. The independent variable was cues about cervical cancer screening which had two levels of high and low. This was arrived at by assigning a numerical score to each of the questions under this construct. The scores ranged from 4 to 1 for positive statements on a four-point Likert scale and the reversed score for negative statements. The respondent's level of agreement or disagreement to a particular item determined her score. The total score for each respondent was computed by summing all the scores for that particular individual. The score demonstrated the opinion of that respondent about the construct being measured. This process applied to all the other perceived constructs.

Respondents with scores of 19-20 on cues about cervical cancer screening subscale had high cues about cervical screening while those with

scores of 5-18 had low cues. This meant that a score of less than 75% was considered low cues while 75% or more had high cues. These scores were used in a previous study (Hoque et al., 2009; Ibekwe et al., 2010). The independent variable or cues had two levels of high and low. The dependent variable was the intention to obtain cervical cancer screening. Details about the level of measurement of the dependent variable have been described in hypothesis one. A binary logistic regression analysis was performed which showed that the data failed to support the null hypothesis. This indicated that high cues about screening influenced intention to screen.

Hypothesis four stated that more HIV-positive women with high perceived seriousness of cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low perceived seriousness. The independent variable was perceived seriousness which had two levels of high and low. Respondents with perceived seriousness score of less than 75% were considered to have low perception of seriousness of cervical cancer. These respondents had total scores ranging from 8-25 on perceived seriousness of cervical cancer subscale. Those with a score of 75% or more had high perceptions of seriousness. These respondents had scores ranging from 26-32. Hoque et al. (2009) and Ibekwe et al. (2010) used these scores to determine high and low perceived severity of cervical cancer. The dependent variable was the intention to obtain cervical cancer screening. Details about the level of measurement of the dependent variable have been described in hypothesis one. The binary logistic regression analysis was performed which showed that the

data failed to support the null hypothesis. This suggests that high perceived seriousness influenced intention to screen.

Hypothesis five stated that more HIV-positive women with high perceived benefits of cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with low perceived benefits. The independent variable was perceived benefit which had two levels of high and low. Respondents with a score of 23-28 on the perceived benefits of cervical cancer screening subscale had a high perception of the benefits of screening while those with scores 7-22 had low perception of the benefits. This meant that a score of less than 75% was considered low perception while 75% or more had high perception. These scores were used in a previous study (Hoque et al., 2009; Ibekwe et al., 2010). The dependent variable was the intention to obtain cervical cancer screening. Details about the level of measurement of the dependent variable have been described in hypothesis one. The binary logistic regression analysis suggested that the data failed to support the null hypothesis which suggests that high perceived benefits about screening influenced intention to screen.

Hypothesis six stated that more HIV-positive women with low perceived barriers to cervical cancer screening have the intention to seek cervical cancer screening than HIV-positive women with high perceived barriers. The independent variable was perceived barrier which had two levels of high and low. The scores used in arriving at the high and low groups are the same as what has been described in hypothesis four. The dependent variable was the intention to obtain cervical cancer screening. The details about the level of measurement

of the dependent variable have been described in hypothesis one. The binary logistic regression analysis showed that the data supported the null hypothesis that perceived barriers did not influence intention to screen.

Hypothesis seven stated that more HIV-positive women with high perceived susceptibility to cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low perceived susceptibility. The independent variable was perceived susceptibility which had two levels of high and low. The scores used in arriving at the high and low groups are the same as what has been described in hypothesis four. The dependent variable was intention to obtain cervical cancer screening. The details about the level of measurement of the dependent variable have been described in hypothesis one. The binary logistic regression analysis showed that the data supported the null hypothesis that perceived susceptibility does not influence intention to screen.

Hypothesis eight stated that socio-demographic factors predict intentions to seek cervical cancer screening. The independent variables were level of education which had three levels; high level of education (tertiary), low level of education (primary and secondary) and no formal education. Marital status had two levels; married (married and cohabiting) and unmarried (single, divorced, and widowed). Employment status had two levels: working and non working (student, retired, and unemployed). As regard religion, the participants were classified into Christians and Muslims. Age was classified into 30 years and above and under 30. The economic ability to afford the cost of cervical screening was classified into affordable cost (very affordable and fairly affordable) and not affordable. The independent variables were categorical and measured on the

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of the dependent variable have been described in hypothesis one. The binary logistic regression analysis showed that the data supported the null hypothesis that perceived barriers did not influence intention to screen.

Hypothesis seven stated that more HIV-positive women with high perceived susceptibility to cervical cancer have the intention to seek cervical cancer screening than HIV-positive women with low perceived susceptibility. The independent variable was perceived susceptibility which had two levels of high and low. The scores used in arriving at the high and low groups are the same as what has been described in hypothesis four. The dependent variable was intention to obtain cervical cancer screening. The details about the level of measurement of the dependent variable have been described in hypothesis one. The binary logistic regression analysis showed that the data supported the null hypothesis that perceived susceptibility does not influence intention to screen.

Hypothesis eight stated that socio-demographic factors predict intentions to seek cervical cancer screening. The independent variables were level of education which had three levels; high level of education (tertiary), low level of education (primary and secondary) and no formal education. Marital status had two levels; married (married and cohabiting) and unmarried (single, divorced, and widowed). Employment status had two levels: working and non working (student, retired, and unemployed). As regard religion, the participants were classified into Christians and Muslims. Age was classified into 30 years and above and under 30. The economic ability to afford the cost of cervical screening was classified into affordable cost (very affordable and fairly affordable) and not affordable. The independent variables were categorical and measured on the

nominal scale. The dependent variable was the intention to obtain cervical cancer screening which was measured as described in hypothesis one. From the analysis, the data supported the null hypothesis for marital status, age, economic ability to afford the cost of screening, employment status, and religion regarding intention for cervical screening. However, it failed to support the null hypothesis that educational level does not influence intention.

CHAPTER FOUR

RESULTS AND DISCUSSION

The purpose of the study was to assess the levels of knowledge of HIV-positive women about cervical cancer and screening, determine the extent to which perceived susceptibility, seriousness, benefits, barriers, and cues about cervical cancer screening influence intentions to obtain screening test, and to identify the demographic factors influencing intentions of HIV-positive women to seek cervical screening in the Central Region of Ghana. The first part of this chapter presents the descriptive results for the entire study followed by hypotheses, interpretation of results and discussion.

Descriptives on Intention, Perceived Susceptibility, Perceived Seriousness, Perceived Benefits, Perceived Barriers, Cues, and Knowledge about Cervical Cancer and Screening

The intention of respondents regarding cervical cancer screening was elicited. Out of the 660 respondents, 82% (n = 540) had the intention to go for cervical cancer screening while 18% (n = 120) had no intention of seeking cervical cancer screening. In addition, respondents' responses were classified into low and high groups on the basis of perceived susceptibility. Table 2 shows that approximately 87% (n = 573) had low susceptibility perception. Regarding the respondent's perception of the seriousness of cervical cancer, Table 2 shows that about 46% (n = 305) had a high perception of the seriousness of cervical cancer. Similarly, approximately 53% (n = 352) of the respondents had a low perception of the benefits of cervical cancer screening.

Table 2- *Summary of Descriptives on Perceived and Knowledge Scales*

Factors	Frequency	Percentage
Perceived Susceptibility		
High	87	13.2
Low	573	86.8
Perceived Seriousness		
High	305	46.2
Low	355	53.8
Perceived Benefits		
High	308	46.7
Low	352	53.3
Perceived Barriers		
High	148	22.4
Low	512	77.6
Cues		
High	130	19.7
Low	530	80.3
Knowledge about Cervical Cancer		
High	122	18.5
Moderate	173	26.2
Low	365	55.3
Knowledge about Cervical Screening		
High	470	71.2
Moderate	132	20.0
Low	58	8.8
Total	660	100.0
		N = 660

Source: Field Survey, Ebu Enyan (2016)

About twenty two percent of the respondents (n = 148) had a high perception of the barriers of cervical cancer screening. In addition, a high proportion of 80% (n = 530) of respondents had low cues about screening. Again, the responses by the respondents were classified into low, moderate and high groups for knowledge about cervical cancer and screening based on their total scores to the items constituting the scales. Table 2 shows that 26% (n = 173) had moderate knowledge about cervical cancer. About fifty five percent (n = 365) had low knowledge about cervical cancer. The Table further shows that more than half of the respondents, 71% (n = 470), had high level of knowledge about cervical cancer screening.

Overall Binary Logistic Regression Model to Predict Intention to Seek Cervical Cancer Screening based on All Predictors

In order to test the hypotheses posed in the study, a full binary logistic regression analysis was performed using the Forced entry or Enter method as shown in Table 3. A test of the full model with the 13 predictors against a constant only model was statistically significant (-2 Loglikelihood statistics = 536.712, χ^2 = 88.750, df = 16, p = 0.001), suggesting that the predictors as a set could distinguish between HIV-positive women with intention to seek cervical screening and those who did not have the intention. The variance in intention accounted for was moderate (Nagelkerke R^2 = 0.206), indicating approximately 21% of shared variance between intention and the set of predictors. This suggests that the model was a significant fit for the data (Ofori & Dampson, 2011).

Table 3-*Overall Binary Logistic Regression Model to Predict Intention to Seek Cervical Cancer Screening based on All Predictors*

Variables	B	Wald	p-value	OR	95% CI for OR Lower	Upper
Knowledge about Cervical Cancer		2.843	0.241			
High	-0.530	2.667	0.102	0.589	0.312	1.112
Moderate	-0.243	0.815	0.367	0.784	0.462	1.330
Knowledge about Cervical Screening		11.212	0.004			
High	1.012	1.012	0.002	2.752	1.428	5.305
Moderate	1.265	9.796	0.002	3.544	1.605	7.828
Cues	1.247	7.528	0.006	3.481	1.428	8.485
Perceived Seriousness	0.705	7.960	0.005	2.023	1.240	3.301
Perceived Benefits	0.521	4.599	0.032	1.683	1.046	2.709
Perceived Barriers	0.012	0.001	0.969	1.012	0.544	1.883
Perceived Susceptibility	0.942	3.457	0.063	2.565	0.950	6.925
Level of education		15.512	0.001			
High	1.150	7.971	0.005	3.159	1.421	7.020
Low	0.980	14.347	0.001	2.665	1.605	4.424
Marital status	0.161	0.473	0.492	1.174	0.743	1.856
Religion	0.086	0.059	0.808	1.090	0.546	2.176
Age (in years)	0.113	0.145	0.704	1.119	0.626	2.000
Employment status	0.490	4.024	0.045	1.632	1.011	2.635
Affordable	0.224	0.676	0.411	1.251	0.734	2.131
Constant	2.164	35.349	0.001	8.704		

Source: Field Survey, Ebu Enyan (2016)

The overall model in Table 3 shows that knowledge about cervical cancer screening ($p = 0.004$), cues ($p = 0.006$), perceived seriousness ($p = 0.005$),

perceived benefits ($p = 0.032$), and level of education ($p = 0.001$) contributed significantly to the prediction of the intention to screen. The Wald statistics ($\chi^2 = 15.512$) indicated that level of education contributed more to the prediction of intention followed by knowledge about cervical cancer screening ($\chi^2 = 11.212$).

The ability of the model to correctly classify the respondents in terms of their intention was found to be very high (81.5%). The model's sensitivity was also very high (96.7%). This meant that (96.7%) of the respondents with intention were correctly classified. Its specificity was (13.3%), which is an indication that 13.3% of the respondents without intention were correctly classified.

Hypothesis 1: More HIV-positive Women with Moderate to High Knowledge about Cervical Cancer have Intention to Seek Cervical Cancer Screening than HIV-Positive Women with Low Knowledge

The hypothesis sought to determine whether more HIV-positive women with moderate to high knowledge about cervical cancer have intention to seek cervical cancer screening than HIV-positive women with low knowledge. The binary logistic regression model was used to assess the prediction of HIV-positive women's intention to seek cervical cancer screening based on their knowledge about cervical cancer.

The study compared the levels of the predictors for significant differences. The results in Table 4 show that a high level of knowledge about cervical cancer did not contribute significantly to the prediction of intention to seek cervical cancer screening in the model. This is because using those with low knowledge about the disease as a reference category, the comparison produced a

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p-value of 0.102 for those with high knowledge (OR = 0.59 [95% CI, 0.31-1.11]). Again, moderate knowledge about cervical cancer did not contribute significantly to the model (*p* = 0.367, OR = 0.78, [95% CI, 0.46-1.33]). The results show that knowledge about cervical cancer did not contribute to intention to screen. A possible explanation for this outcome may be that, some HIV-positive women may not be aware that they are highly susceptible to the disease and may lack information about cervical cancer preventive measures.

Table 4- *Binary Logistic Regression Model to Predict Respondents' Intention to Seek Cervical Cancer Screening based on Respondents' Knowledge about Cervical Cancer*

Variables	n (%)	B	Wald	*p*-value	OR	95% CI for OR Lower	Upper
Knowledge							
High	102 (19)	-0.53	2.67	0.102	0.59	0.31	1.11
Moderate	143 (27)	-0.24	0.82	0.367	0.78	0.46	1.33
Low (Ref.)	295 (55)						
Constant		2.16	35.35	0.001	8.70		

Source: Field Survey, Ebu Enyan (2016)

This result supports that of previous studies conducted among HIV-positive women in developed settings (Bynum et al., 2013; Lambert et al., 2015) in which knowledge about cervical cancer did not significantly determine screening intention. This consistency could be that the studies focused on HIV-positive

women and the participants were recruited from health facilities. Again, measurement of knowledge may have been similar across the studies.

Health promotion interventions, however, have been based on the idea that adequate knowledge about the causes of a health problem and alternatives available for its management may have a significant impact in changing undesirable health behaviours, it seems knowledge at the micro or individual level may not sufficiently result in the needed change as there are complex influences on health behaviours (Mackian, 2003). Knowledge about cervical cancer not predicting intention in the present study could be due to the fact that 55% (n = 295) of HIV-positive women had low knowledge about the disease. This suggests that some HIV-positive women may have misconceptions about the disease. For instance, since some did not know the part of the body the disease affects, it would be difficult conceptualising and understanding the impact the disease could have on affected women.

Moreover, it has been well documented that cervical cancer is preventable when it is detected early through screening (Castle et al., 2010; UNFPA, 2011; WHO, 2013a). This pointed to the fact that cervical cancer treatment could be initiated early to stop the disease from progressing and also for cure to be achieved. Again, there was inadequate knowledge about the risk factors which strongly suggests that it could affect HIV-positive women's perception of susceptibility and possible engagement in cervical screening activities. A previous study affirmed that HIV-positive women lacked knowledge about cervical cancer, especially the risk factors which may not facilitate the adoption of preventive health actions (Lambert et al., 2015). Although HIV-

positive women are offered counseling services and health education on lifestyle modification and prevention of co-morbidities, it seems plausible to assume that regular visits to HIV/AIDS clinics may not adequately equip women living with the disease with the essential information they require about cervical cancer (Sichanh et al., 2014). It is known that the low level of knowledge about the disease may not permit women who are at a high risk to follow doctor's recommendations (Ahmed et al., 2013; Getahun et al., 2013; Mupepi et al., 2011; Nwankwo et al., 2011).

Rather, a well designed comprehensive education on the causes, risk factors, signs and symptoms and measures for prevention will facilitate understanding of the disease and help clarify misconceptions. This is because misconceptions and myths about the disease can potentially restrict women who are at a high risk from participating in cervical screening programmes (Hyacinth et al., 2012; Kwok et al., 2011; Were et al., 2011). Moreover, in Ghana, culturally, chronic diseases of which HIV and cervical cancer are examples may be attributed to a curse from the gods for wrong doing, punishment from the ancestors, witchcraft, and sorcery (Dako-Gyeke et al., 2013). To add to this, poverty and lack of knowledge about cervical cancer have been reported to be associated with non-adherence to referrals for screening (GSS, 2012). Therefore, high knowledge about cervical cancer among HIV-positive women is required for appropriate health behaviours to be undertaken.

Meanwhile, the TPB and PMT stipulated that an individual's intention to choose the required health behaviour may be as a result of several beliefs (Ajzen & Fishbein, 1985; Sutton, 2002). The HBM and BPM also posit that knowledge

which is a structural variable can influence behaviour (Glanz et al., 2002; Stanhope & Lancaster, 2002). However, previous studies found knowledge about cervical cancer to be a predictor of cervical screening behaviour in Tanzania (Kahesa et al., 2012; Lyimo & Beran, 2012). A possible explanation is that cervical cancer screening awareness may be high since Tanzania has the highest burden of cancer of the cervix in East Africa (Plotkin et al., 2014). Awareness-raising campaigns and education may have been high which could have influenced intention and screening utilisation.

The finding of the present study differed from that of Kahesa et al. (2012) and Lyimo and Beran (2012), probably, because these studies were population-based and adopted multistage sampling procedures. Although these studies focused on women, in terms of the eligibility criterion, women aged 25 to 59 years participated in the study by Kahesa et al. while those aged 18 to 69 years were involved in the study by Lyimo and Beran. Additionally, the women were not known to be HIV-positive and as a result, their perceptions and beliefs may have contributed to the outcome. The use of random sampling procedures may allow the findings to be generalised. However, the present study made use of accidental sampling which limits the ability of the findings to be generalised to other populations.

In Ghana, previous studies have pointed out that the low level of knowledge about cervical cancer (Ebu et al., 2014; Adanu, 2002) and the absence of a national policy and guidelines on cervical cancer screening (Adanu) could be factors slowing down efforts to prevent cervical cancer. It is worth mentioning that in settings where policies and screening guidelines are well

established, knowledge about the disease seems to be high which may influence the intention to seek screening. The finding implied the need to intensify health education on cervical cancer, focusing on the cause, risk factors, signs and symptoms and measures for prevention among women who are at high risks of developing the disease. Misconceptions HIV-positive women have about the disease should be clarified. Emphasis should be placed on the fact that it affects the cervix and is a preventable disease. Lyimo and Beran (2012) emphasised that efforts by the government to increase public education and target interventions at all levels of the health care delivery system, especially in the community, are critical.

Furthermore, the finding implied that there could be a high possibility of some HIV-positive women reporting to the hospital with an advanced form of cervical cancer since the disease affects a part of the reproductive organ that cannot be seen ordinarily. Hence, it will be difficult for a person suffering from the disease without adequate knowledge about cervical cancer to detect it early and report to the hospital. Empirical evidence affirmed that having inadequate knowledge about cancer of the cervix could lead to poor attitudes about screening (Adanu et al., 2010; Bitok et al., 2013; Ebu et al., 2014). The evidence is required in designing initiatives that will promote the health of women at a high risk of developing cancer of the cervix.

Hypothesis 2: More HIV-positive Women with Moderate to High Knowledge about Cervical Cancer Screening have Intention to Seek Cervical Cancer Screening than HIV-Positive Women with Low Knowledge

This hypothesis sought to determine whether more HIV-positive women with moderate to high knowledge about cervical cancer screening have intention to seek cervical cancer screening than HIV-positive women with low knowledge. The binary logistic regression model was used to test this hypothesis. The study compared the levels of the predictors for significant differerences. The p-value of 0.002 for moderate and high knowledge about cervical cancer screening as shown in Table 5, respectively indicate a significant contribution of knowledge levels about cervical screening predicting intention. Using those with low knowledge as a reference category, respondents with moderate knowledge about cervical screening were approximately 4 times more likely to have intention to seek cervical screening (OR = 3.54, [95% CI, 1.61-7.83]). Again, respondents with high knowledge were approximately 3 times more likely to have intention to seek screening (OR = 2.75, [95% CI, 1.43-5.31]). A possible explanation for this outcome may be that HIV-positive women with moderate knowledge may have low level of education and a higher tendency of accepting recommendations by health care professionals compared to those with high knowledge. This suggested that those with high knowledge may have high level of education, and as such they had more information about the disease and screening facilities available which may necessary not lead to intention to screen.

The finding showed that respondents with moderate to high knowledge about cervical screening may have intention to screen compared to those with

low knowledge. A possible explanation for this outcome could be that these women may have been exposed to some education about health screening on the mass media and health facilities. For instance, in the present study, 72% (n = 391) of the respondents with intention to screen had high knowledge about cervical screening.

Table 5-*Binary Logistic Regression to Predict Intention to Seek Cervical Cancer Screening based on Knowledge about Cervical Cancer Screening*

Variables	n (%)	B	Wald	p-value	OR	95% CI for OR Lower	Upper
Knowledge							
High	391(72)	1.01	1.01	0.002	2.75	1.43	5.31
Moderate	112(21)	1.27	9.79	0.002	3.54	1.61	7.83
Low (Ref.)	37(7)						
Constant		2.16	35.35	0.001	8.70		

Source: Field Survey, Ebu Enyan (2016)

Therefore, cervical screening seems to be an essential public health intervention that can facilitate early detection of precancerous lesions (Castle et al., 2010; CDC, 2014; Kerr & Fiander, 2009). HIV-positive women may have perceived screening to be beneficial to their health. The result corroborates previous findings (Gu et al., 2012; Hanisch et al., 2007; Maree & Moitse, 2014) in which knowledge about Pap smear tests led to cervical screening by HIV-positive women in South Africa (Maree & Moitse), among Chinese women (Gu et al.) and in women attending health facilities in Columbia (Hanisch et al.). The use of

convenience sampling, interviewer-administered questionnaire and HBM could possibly explain the similarities in results. In addition, the studies by Maree and Moitse and Hanisch et al. were hospital-based and participants may share certain characteristics with the present study.

In a study conducted in South Africa, HIV-positive women were more knowledgeable about cervical cancer screening compared to those who were HIV-seronegative (Maree & Moitse, 2014). It seems these women may have been exposed to information about cervical cancer and screening since they are more vulnerable. Similarly, in Columbia, knowledge about Pap test was a determinant of screening (Hanisch et al., 2007). While there are no effective policies to ensure cervical screening in Ghana, in some developing and developed settings, Pap test is required for all women who are sexually active, and there are well designed systems to ensure that all eligible women are screened.

Several theories including the HBM, BPM, PMT and TPB have highlighted that knowledge can influence intention (Ajzen & Fishbein, 1985) and actual behaviour (Glanz et al., 2002; Sutton, 2002). From the perspective of the TPB, if an HIV-positive woman gets to know about screening from health providers, the mass media and significant others, the person may have the intention to screen (Ajzen & Fishbein). The HBM, PMT and BPM also emphasised that knowledge may positively impact the initiation of a health behaviour change (Glanz et al.; Sutton, 2002; Stanhope & Lancaster, 2002). The findings are in line with the proposition of these theories that knowledge about

convenience sampling, interviewer-administered questionnaire and HBM could possibly explain the similarities in results. In addition, the studies by Maree and Moitse and Hanisch et al. were hospital-based and participants may share certain characteristics with the present study.

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health behaviour or action could influence the intention of achieving a desirable behaviour.

However, the results of the study differed from that of Chirayil et al. (2014) and Mupepi et al. (2011) in which knowledge about screening did not significantly contribute to intention to screen. The difference could arise from the fact that Mupepi et al. conducted a population-based study and random sampling procedures were used in selecting respondents who were not HIV-positive for the study. Meanwhile, the present study employed accidental sampling which has a high possibility of human judgement influencing the process (Bryman, 2008). Similarly, Chirayil et al. conducted a theory-based study based on the TPB. A sample size of 206 women aged 18 to 26 who were not known to be HIV-positive participated in the study which is not congruent with the sample characteristics of this study. The present study combined constructs from the TPB and HBM and that could have influenced the outcome.

This finding could lay an important foundation for health promotion strategies as screening is known to be a single most crucial intervention in decreasing risk of cervical cancer. This implied that interventions to increase knowledge about cervical cancer screening are necessary, especially for women with low knowledge about screening since they may be at high risk of developing the disease. Low knowledge about cervical screening may not facilitate the adoption of health appropriate behaviours that could prevent cervical cancer (Bynum et al., 2013; Chirayil et al., 2014; Lambert et al., 2014). In Ghana, although the Ministry of Health has proposed educational programmes and awareness-raising campaigns about the disease (GHS, 2013), these have not

been operationalised. This medium may be effective in reaching out to those with low knowledge about the disease. Additionally, mass media campaigns in the form of televisions, national radio and specific community radios could be used to sensitize women about cervical screening.

Emphasis should be placed on the fact that screening can prevent cervical cancer, as it could enable HIV-positive women to make informed choices about the test. This is owing to the fact that resources and effective health promotion strategies are critical in increasing cervical screening utilisation (Anorlu, 2008; Denny & Anorlu, 2012). Currently, it seems that there are no standard protocols on cervical cancer screening in health facilities.

Hypothesis 3: More HIV-Positive Women with High Cues about Cervical Cancer Screening have Intention to Seek Cervical Cancer Screening than HIV-Positive Women with Low Cues

The aim of this hypothesis was to compare scores from respondents based on cues about cervical cancer relative to their intention to seek screening. Using respondents in the low group as a reference category, it could be deduced from Table 6 that cues about cervical screening significantly predicted intention to screen ($p = 0.006$). Those with high cues about screening were 3 times more likely to have the intention to screen (OR = 3.48, [95% CI, 1.43-8.49]). The results show that the presence of high cues was a determinant of the intention to seek cervical screening by HIV-positive women. A possible explanation to this may be that high cues will enable HIV-positive women to have adequate information about screening which may influence screening behaviour. For

instance, it may enable them to know where to go for the test, what the test entails and the benefits they could derive for availing for screening.

Table 6-*Binary Logistic Regression to Predict Intention to Seek Cervical Cancer Screening based on Perceived Scales*

Variables	n (%)	B	Wald	p-value	OR	95% CI for OR Lower	Upper
Cues							
High	124 (23)	1.25	7.53	0.006	3.48	1.43	8.49
Low (Ref.)	416 (77)						
Perceived Seriousness							
High	272 (50)	0.71	7.96	0.005	2.02	1.24	3.30
Low (Ref.)	268 (50)						
Perceived Benefits							
High	269 (50)	0.52	4.59	0.032	1.68	1.05	2.71
Low (Ref.)	271 (50)						
Perceived Barriers							
High	127 (24)	0.01	0.01	0.979	1.01	0.54	1.88
Low (Ref.)	412 (76)						
PerceivedSusceptibility							
High	82 (15)	0.94	3.46	0.063	2.57	0.95	6.93
Low (Ref.)	458 (85)						
Constant		2.16	35.35	0.001	8.70		

Source: Field Survey, Ebu Enyan (2016)

Previous studies found high cues to be a strong predictor of cervical screening intention and actual screening (Ezechi et al., 2013; Everelt, 2011;

Figueroa-Minoz Ledo et al., 2014; Fort et al., 2011; Kahn et al., 2001; Kwok et al., 2011; Leece et al., 2010; Lyimo & Beran, 2012; Maree & Moitse, 2014; Morema et al., 2014; Ndejjo et al., 2016; Nwankwo et al., 2011; Obeidat et al., 2012; Obi et al., 2007;Tacken et al., 2007). These studies pointed out that doctor's recommendation, use of invitation letters, advertisements about the disease, and access to health education about the disease in primary care facilities would increase cervical screening intention and utilisation among women, especially those living with HIV. Despite heterogeneity in the methodology, the conceptual basis of these studies could possibly explain the similarities in results as they can be linked to the HBM and TPB. The studies also employed health communication in determining women's reaction about screening. It seems this method provides a powerful medium that equips people with the necessary information for behaviour change to be effected.

High cues seem to play a significant role in encouraging HIV-positive women to have intention to screen. In the present study, 23% (n = 124) of the respondents with high cues had the intention of obtaining cervical cancer screening. This could be due to the fact that health education seems to equip people with information and empowers them to be self-reliant, which could have a longer impact in influencing positive health behaviours. In a retrospective study conducted by Leece et al. (2010) in Ottawa hospital, Canada, HIV-positive women who had access to primary care providers at the hospital had higher chances of availing for cervical screening.

Again, a systematic review involving randomised controlled and cluster randomised controlled trials studies conducted in developing settings found one-

on-one education to be highly effective in increasing cervical screening uptake (Brouwers et al., 2011). Previous studies conducted in Ghana (Abotchie & Shokar, 2009; Ebu et al., 2014), South Africa (Maree & Moitse, 2014) and Nigeria (Nwankwo et al., 2011) reported that doctors' recommendation may be vital in enhancing cervical cancer screening uptake. The high level of agreement about doctors' referral for screening by HIV-positive women could be attributed to the fact that health screening is generally not part of the culture of most African women. As a result, they often seek health care when symptoms of a disease are eminent (Mandle, 2002). Encouragement and advice from doctors may be critical in timely detection of cervical cancer.

Evidence from a meta-analysis of 38 RCT studies found cues to be a strong predictor of screening intention, but recommended that the use of invitation letters may greatly impact cervical screening (Everelt, 2011). However, these studies were conducted in developed settings which make their applicability in a middle-income country like Ghana questionable. All the same, the findings of the present study suggested that 77% (n = 416) of HIV-positive women with intention to screen had low cues about the disease. This meant that these women could be at high risks of developing cervical cancer since they may not have the intention to undergo screening. Consequently, these categories of HIV-positive women need to be supported to avail for cervical screening by increasing cues about the disease.

Recommendation or referral by doctors and nurses, and equipping women with information by educating them about the disease and screening in health facilities may positively affect attitudes and beliefs of women about the

disease. For instance, in South Africa, HIV-positive women engaged in cervical cancer screening because medical doctors provided them with that important information (Maree & Moitse, 2014). Access to primary health care including child welfare clinics seems to influence intention as women who had such services had higher chances of having intention to seek screening compared with those with limited access (Maree & Moitse; Morema et al., 2014).

A meta-analysis of studies on mass media campaigns conducted in the United States showed a small significant effect (Snyder et al., 2004). Despite the contextual differences, the findings may be relevant to the Ghanaian setting. Other empirical works reported that recent diagnosis of HIV, level of education (Ezechi et al., 2013) and personal beliefs about screening have been associated with cervical screening intention (Kahn et al., 2001). Nonetheless, systematic reviews conducted by Baron et al. (2008) and Marcus and Crane (1998) reported that the provision of adequate resources and organised screening services may enhance screening intention and behaviour.

This demands a careful consideration of the population characteristics in designing programmes aimed at increasing cervical screening intention. The finding suggested that cues play an important role in health promotion and is in line with the constructs of HBM, PMT and TPB. The TPB emphasised external control factors which examined the opportunities available for the individual to perform the behaviour influencing intention (Ajzen & Fishbein, 1985). The HBM considers health education, media information and symptoms of illness from relatives as important cues to action (Glanz et al., 2002). The PMT

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Cues can take several forms but it seems for HIV-positive women, referral by doctors and health education in the hospitals may enable them to protect themselves from a potential health threat. The finding implied that HIV-positive women with low cues may be at high risks of developing the disease. These women may not have adequate information about the disease to empower them to seek cervical screening. Earlier empirical works have also emphasised the need for some cues to enable women to engage in cervical screening (Abotchie & Shokar, 2009; Fort et al., 2011; Kahn et al., 2001). This may be a cost-effective intervention that could positively influence intention of HIV-positive women, especially those with low cues, as information about screening may not be readily available to the general public. The information should be devoid of threats, as threat appeals were found to have increased fear arousal but did not lead to a significant effect on driving outcomes in a previous meta-analysis (Carey et al., 2013). The finding has an important implication for public health education on cervical cancer and screening in health facilities about managing women with HIV-positive status. Health education programmes on cervical cancer and screening could be designed to enable women access the essential information about the disease and screening.

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Hypothesis 4: More HIV-Positive Women with High Perceived Seriousness of Cervical Cancer have Intention to Seek Cervical Cancer Screening than HIV-Positive Women with Low Perceived Seriousness

The aim of this hypothesis was to compare scores of respondents based on their perception of seriousness of cervical cancer relative to their intention to seek screening. Using respondents in the low group as a reference category, it was seen in Table 6 that perceived seriousness significantly contributed to the model with a p-value of ($p = 0.005$). Respondents with a high perception of the seriousness of cervical cancer were 2 times more likely to have intention to screen (OR = 2.02, [95% CI, 1.24-3.30]).

The finding shows that perception of the seriousness of cervical cancer was a determinant of cervical cancer screening intention. A possible explanation for this outcome could be that respondents may have perceived cervical cancer as detrimental to life. For instance, in the current study, 50% (n = 272) of the respondents had a high seriousness perception of the disease. It is plausible to assume that HIV-positive women with a high seriousness perception may be knowledgeable about the fact that cervical cancer is an equally devastating and deadly disease. Cervical cancer can affect women physically, psychologically and mentally. This could have consequences on sexual relationships and socio-economic development of the individual affected by the disease. Therefore, the perception of seriousness of the disease as an essential factor in determining the intention to screen may enable HIV-positive women to evaluate the seriousness and complications associated with the disease and to take appropriate decisions about screening.

Previous studies found perception of seriousness of cervical cancer to have predicted cervical screening behaviour (Ho et al., 2005; Morema et al., 2014; Ncube et al., 2015). The findings of these studies are congruent with the present study as these earlier studies were cross-sectional in nature, employed an interviewer-administered questionnaire and used the HBM as the theoretical framework. Hence, operationalisation of the construct of seriousness would have been similar across the studies. For instance, the study by Ho et al. was conducted among Vietamese immigrants residing in the United States but the items used to measure perceived seriousness of the disease were similar to that of the present study. In the same way, the study by Ncube et al. was conducted among Jamaican women and knowledge about the consequences of cervical cancer led to cervical screening as cervical cancer was perceived to have dire consequences on those suffering from the disease.

The finding is consistent with the HBM construct of perceived seriousness that perception of seriousness can result in positively engaging in the behaviour (Stanhope & Lancaster, 2002). PMT and TPB also posit that an individual's perception of the seriousness of a disease could lead to intention and actual behaviour. The intention to engage in particular health behaviour is linked with certain beliefs of the individual (Ajzen & Fishbein, 1985; Ogden, 2004; Sutton, 2002). The finding of this study highlights the relevance of these theories in explaining perceived seriousness of cervical cancer among women living with HIV. Cervical cancer, if not detected early through screening and managed, could have serious complications on those affected with the disease. For instance, it can lead to the removal of the womb and fallopian tubes if the cancer

spreads to those organs (National Cancer Institute, 2015). To add to this, the treatment of cancer can have devastating consequences as effects of radiotherapy, for instance, can be severe and result in the peeling of the skin, itching, blistering and fatigue (American Cancer Society of Clinical Oncology, 2015; Cancer Research UK, 2015). Therefore, there is the need for HIV-positive women to avail themselves for screening for any cervical abnormalities to be detected before cancer develops.

Despite the seriousness of cervical cancer on women's health, Hoque et al. (2009) found no significant relationship between perceived severity of cervical cancer and screening behaviour. The methodology employed by Hoque et al. was consistent with that of the present study. Therefore, volunteer bias may be a potential concern for the difference in findings. Shi et al. (2012) reported that perceived seriousness was not a determinant of HIV testing. The study involved secondary data analysis of which data were obtained from the 2005 Los Angeles County Survey which employed a random sampling. The characteristics of the population sampled could possibly account for the difference in the findings as the respondents were not HIV-positive. Meanwhile, a meta-analysis concluded that perception of severity could enhance adaptive intention as those who perceived cervical cancer to be a serious disease had higher probabilities of seeking screening (Floyd et al., 2010).

The finding implied that public health education on cervical cancer screening should highlight the seriousness of the disease as it could potentially enhance HIV-positive women's intention about screening. However, the finding suggested that HIV-positive women with low seriousness perception may be at

high risks of developing cancer of the cervix since they may be less likely to have intention to screen. This is because they may have not evaluated the complications associated with the disease (Hoque et al., 2009; Ingledue et al., 2004) and the emotional and psychological distress women with the disease go through. This is a critical area of concern in health promotion. There is a high possibility that they may also lack knowledge about the potential risk factors. It is, therefore, imperative that educational programmes specifically target these women as such programmes may be critical in enhancing intention. Additionally, such women would be able to adopt healthy behavioural practices that may protect them from developing the disease. By so doing, the risk of cervical cancer may be decreased while the promotion of the health of HIV-positive women will be enhanced.

Hypothesis 5: More HIV-Positive Women with High Perceived Benefits of Cervical Cancer Screening have Intention to Seek Cervical Cancer Screening than HIV-Positive Women with Low Perceived Benefits

The aim of this hypothesis was to compare the scores of the respondents based on their perceptions of benefits of cervical cancer screening relative to their intention to seek screening. Using respondents in the low group as a reference category, it was seen that perceived benefits contributed significantly to the model with a p-value of ($p = 0.032$). Table 6 shows that respondents with high perceived benefits of cervical cancer screening were approximately 2 times more likely to have the intention to screen (OR = 1.68, [95% CI, 1.05-2.71]). The finding showed that a perception of the benefits predicted intention to screen. A possible explanation for this outcome may be that respondents had

high risks of developing cancer of the cervix since they may be less likely to have intention to screen. This is because they may have not evaluated the complications associated with the disease (Hoque et al., 2009; Ingledue et al., 2004) and the emotional and psychological distress women with the disease go through. This is a critical area of concern in health promotion. There is a high possibility that they may also lack knowledge about the potential risk factors. It is, therefore, imperative that educational programmes specifically target these women as such programmes may be critical in enhancing intention. Additionally, such women would be able to adopt healthy behavioural practices that may protect them from developing the disease. By so doing, the risk of cervical cancer may be decreased while the promotion of the health of HIV-positive women will be enhanced.

Hypothesis 5: More HIV-Positive Women with High Perceived Benefits of Cervical Cancer Screening have Intention to Seek Cervical Cancer Screening than HIV-Positive Women with Low Perceived Benefits

The aim of this hypothesis was to compare the scores of the respondents based on their perceptions of benefits of cervical cancer screening relative to their intention to seek screening. Using respondents in the low group as a reference category, it was seen that perceived benefits contributed significantly to the model with a p-value of ($p = 0.032$). Table 6 shows that respondents with high perceived benefits of cervical cancer screening were approximately 2 times more likely to have the intention to screen (OR = 1.68, [95% CI, 1.05-2.71]). The finding showed that a perception of the benefits predicted intention to screen. A possible explanation for this outcome may be that respondents had

knowledge about the benefits of screening. For instance, in the current study, 50% (n = 269) of the respondents perceived cervical cancer screening to be beneficial.

The result of this study is consistent with evidence from previous studies (Ben-Natan & Kutygaro, 2014; Luszczynska et al., 2012) conducted in Israel and Poland respectively in which perception of benefits was linked with an intention to screen. The consistency in findings may be related to the fact that these studies combined constructs from the HBM and TPB in predicting the intention to screen for HIV during pregnancy (Ben-Natan & Kutygaro) and determined empowerment beliefs and intention to use cervical screening (Luszczynska et al.). This meant that knowledge about the benefits of a health promoting action may be critical in enhancing intention and subsequent utilisation.

The finding suggested that HIV-positive women who perceived cervical cancer screening to be beneficial may have the intention to screen. This is supported by a systematic review and meta-analysis that cervical screening offers substantial protective benefits to women, especially when screening is done for women aged 30 years and above. Cervical screening is known to decrease incidence, morbidity and mortality of cervical cancer (Peirson et al., 2013). Although evidence from meta-analysis is considered to be of high quality and can inform practice, the studies included in the review were randomised control trials and observational studies conducted in advanced settings. This finding, however, is of relevance to developing settings as few studies that have been conducted have drawn similar conclusions (Birhanu et al., 2012; Mupepi et al., 2011; Tung, 2010). It seems that in settings where cervical screening

programmes are well established, awareness and knowledge about the benefits may positively influence screening intention. Women who engage in cervical screening tend to have control over their life which can result in high performance in other aspects of their lives (Agurto et al., 2004).

Theoretically, the finding is in line with the HBM and TPB. The HBM hypothesised that individuals with high perceived benefits were more likely to engage in preventive health action than those with low or no perceived benefits (Glanz et al., 2002). This suggests that individuals exhibiting high beliefs in susceptibility and seriousness are not expected to follow any recommended health action unless they perceive the action to be highly beneficial by eliminating or reducing the treat. The TPB emphasises behavioural intention which determines the performance of the actual behaviour which is a result of the person's belief (Ajzen & Fishbein, 1985).

Despite evidence that perception of benefits may encourage women to have intention to seek cervical screening, perceived benefits did not predict screening intention in previous studies (Ben-Natan & Adir, 2009; Ibekwe et al., 2010). The study by Ben-Natan and Adir focused on 108 lesbian women in Israel who were conveniently sampled. The small sample size could have affected the inferences drawn from the study. Again, the methodology used by Ibekwe et al. and the characteristics of the respondents were the same as that employed in the present study. Therefore, the difference in findings could be due to volunteer bias.

The finding implied that highlighting the benefits of cervical screening among HIV-positive women may translate into screening intention. Public health

education should target those with low perceived benefits about the disease. The importance of cervical screening includes its ability to detect precancerous lesions early; enables women to know whether they have the disease or not; can facilitate early treatment; and saves the persons life should be emphasised in addition to the other important factors. This is imperative as health education is known to improve health literacy, and equip people with knowledge and skills that could improve health (WHO, 1998).

Hypothesis 6: More HIV-Positive Women with Low Perceived Barriers to Cervical Cancer Screening have Intention to Seek Cervical Cancer Screening than HIV-Positive Women with High Perceived Barriers

The aim of this hypothesis was to compare the scores of the respondents based on their perceptions of barriers to cervical cancer screening relative to their intention to seek screening. Using respondents in the low group as a reference category, it could be deduced from Table 6 that perceived barriers did not significantly contribute to the model ($p = 0.969$, OR = 1.01, [95% CI, 0.54-1.88]). The finding showed that perceived barrier was not a determinant of intention to screen. A possible explanation for this outcome could be that 76% (n = 412) of the respondents with the intention to screen based on their perception of the barriers had low perception of the barriers. Therefore, the way this construct was classified could have been a contributing factor. The barriers are known to be impediments of intention to seek cervical screening. For instance, it could be that HIV-positive women lack information about cervical cancer and screening.

This finding corroborates that of previous studies conducted in Botswana (Ibekwe et al., 2010), Zimbabwe (Mupepi et al., 2011) and other sub-Saharan cultures (Baskaran et al., 2013; Ben-Natan & Adir, 2009; Ebu et al., 2014; Fort et al., 2011; Maar et al., 2013; Markovic et al., 2005; Mutyaba et al., 2006; Williams et al., 2013) in which perception of barriers was a deterrent to cervical screening. A possible explanation for the similarities in findings could be the HBM construct of perceived barriers that guided the study. The measurement and classification of perceived barrier used by Ibekwe et al. were consistent with that of the current study. It could also suggest that the barriers are widespread in the sub-Saharan cultures.

The finding is in line with the HBM and TPB as they posit that perceived barriers act as impediments to performing recommended health action (Glanz et al., 2002; Frank et al., 2004). The TPB also suggests that perceived barriers could affect behavioural intention and the effectiveness of health behaviour (Ajzen & Fishbein, 1985). This suggests that physical barriers in the form of distance to a facility that could offer cervical screening and financial challenges may deter HIV-positive women from having the intention to screen. It is well documented that potential barriers could be in the form of institutional factors, personal, negative belief, social, fatalistic, financial, and negative misconception (Ebu et al., 2014; Mupepi et al., 2011) which tends to hinder women's ability to engage in cervical screening.

In Malawi, Uganda and Nigeria, the low perception of susceptibility, benefits and knowledge about cervical cancer screening affected women's perception of the barriers to screening (Fort et al., 2011; Mutyaba et al., 2006;

Ndikom & Ofi, 2012). Aside these, institutional factors, long waiting times within health facilities (Kivistik et al., 2011) and inadequate information on the importance of participating in screening (Basu et al., 2006) could affect HIV-positive women's ability to decide to screen and the likelihood of screening. Furthermore, several studies have established a relationship between embarrassment in connection with screening (Logan & Mcilfatrick, 2011; Lyimo & Beran, 2012; Marlow et al., 2008; Sutton & Rutherford, 2005; Teng et al., 2014), misconceptions about the test (Kwok et al., 2011; Williams et al., 2013) and lack of participation in cervical screening programmes.

Nonetheless, evidence from a systematic review concluded that lower perception of the barriers could significantly predict cervical screening utilisation (Bukowska-Durawa & Luszczynska, 2014). The relevance of this finding to the sub-Saharan African region and Ghana in particular may be unclear since all the studies used in the review were conducted in North American, European and Australian continents. In addition, a community-based study conducted in Northern Ethiopia concluded that women with no perceived barriers were two times more likely to avail themselves for cervical cancer screening (Bayu et al., 2016). It seems in advanced settings, there are policies and structures in place that enable women overcome the barriers. However, these barriers are widespread in sub-Saharan cultures. Hence, socio-political factors may determine cervical screening.

The finding implied the need for a supportive legal framework to remove the multiple barriers HIV-positive women encounter as they strive to access cervical screening services. For instance, the cost associated with screening

could be absorbed by the government and non-governmental organisations which have a special focus on people living with HIV. The National Health Insurance Scheme could be expanded to cover cervical screening for high risk women. Access barriers could be bridged by strengthening existing health facilities to perform the test through additional trained personnel, equipment and logistics (Adanu, 2002). In the same way, cervical screening programmes should be designed to be culturally sensitive and to address misconceptions women have about the test (Grewal et al., 2004; Hislop et al., 2004).

Hypothesis 7: More HIV-Positive Women with High Perceived Susceptibility to Cervical Cancer have Intention to Seek Cervical Cancer Screening than HIV-Positive Women with Low Perceived Susceptibility

The aim of this hypothesis was to compare respondents' scores based on their perception of susceptibility to cervical cancer relative to their intention to seek screening. Using respondents in the low group as a reference category, Table 6 shows that perceived susceptibility did not significantly contribute to the model ($p = 0.063$, OR 2.57, [95% CI, 0.95-6.93]). The finding suggests that perception of susceptibility was not a determinant of intention to seek screening. A possible explanation for this outcome could be that HIV-positive women may feel that they are not at a risk of contracting cervical cancer due to their inadequate knowledge about the disease. It could also be that respondents are not aware that cervical cancer affects sexually active women. Another reason could be that respondents may have provided answers that put them in good light since they are all HIV-positive. This could be explained from the point that they did not genuinely evaluate their risk of developing cervical cancer as it is known to

be a serious disease. The result is consistent with the findings of Basu et al. (2006) and Ibekwe et al. (2010). The similarities could stem from the methodology in terms of the conceptual framework, sampling and data collection instrument. It seems that there may have been some consistency in the way the construct of perceived susceptibility was measured.

Several factors could determine perception of susceptibility to cervical cancer including being in a polygamous relationship, having multiple sexual partners and being exposed to a sexually transmitted infection (Balogun et al., 2012; Nadarynski et al., 2012; Were et al., 2011). These factors are closely linked with HIV which makes HIV-positive women highly vulnerable to the disease. However, in the present study, 85% (n = 458) of the respondents had low susceptibility perception of the disease. Meanwhile, cervical cancer is caused by HPV which is sexually transmitted just like HIV. Sexual activity seems to be a medium for effective transmission of HPV, as empirical evidence affirmed that heterosexual contact facilitates exposure to the virus that potentially leads to cervical cancer (WHO, 2013b). Consequently, all sexually active women require cervical screening (WHO, 2013c).

Perceived susceptibility not being a determinant of an intention to screen is a critical area one needs to focus on and design initiatives that will promote the health of HIV-positive women. This is important because HIV-positive women have greater risks of contracting cervical cancer than women who are not infected with the virus (Kumakech et al., 2014; Ndiaye et al., 2012). It emphasises the fact that HIV-positive women may not be prepared to take recommended health action based on their perception of susceptibility. Hall et al.

(2009) and Burger et al. (2014) identified no significant relationship between the state of one being worried about cancer and screening intention.

However, previous studies differed from this finding as women with high susceptibility perceptions had the intention to seek cervical screening (Ma et al., 2013; Nadarynski et al., 2012; Twinomujuni et al., 2015; Were et al., 2011). Perception of susceptibility could be attributed to exposure to a sexually transmitted infection (Garces-Palacio & Scarinci, 2012). The heterogeneity in the methodology may explain the differences in findings. Aside methodological differences, socio-cultural issues relating to the context could possibly account for the contradictory findings. Katz et al. (2007) reported that women who had treatment for STIs had two or more partners and had sexual intercourse before attaining 18 years of age participated in cervical cancer screening. Gu et al. (2012) affirmed that when HIV-positive women perceive themselves to be at high risk of developing cervical cancer, they will be more likely to have an intention and adhere to recommended health behaviours. However, the intention to carry out specific health behaviour is determined by several beliefs (Ajzen & Fishbein, 1985). The HBM also hypothesised that perception of susceptibility could lead to intention to screen. This meant that the present study did not support the HBM's hypothesis on percerived susceptibility.

The finding implied the need for HIV-positive women to be educated on the risk factors for cervical cancer such as having multiple sexual partners as well as the complications associated with the disease. It seems they may not be aware that they are highly susceptible to the disease.

Hypothesis 8: Socio-demographic Factors Predict Intention to Seek Cervical Cancer Screening

The hypothesis sought to identify relationships between the various socio-demographic variables and intention to seek cervical cancer screening. Using the OR, the study assessed the differences between the levels of each variable. The results in Table 7 show that a low level of education (primary and secondary) and high education (tertiary) significantly contributed to the intention to screen with p-values of 0.001 and 0.005 respectively, using respondents with no formal education as the reference category. Respondents with low levels of education were approximately 3 times more likely to have the intention to screen (OR = 2.67, [95% CI, 1.61- 4.42]). Comparatively, those with tertiary or a high level of education were approximately 3 times more likely to have intention to screen (OR = 3.16, [95% CI, 1.42-7.02]). However, marital status (p = 0.492), religion (p = 0.808), age (p = 0.704), employment status (p = 0.045), and economic ability to afford the cost of cervical screening (p = 0.411) did not contribute significantly to the prediction of intention in the model.

The findings suggest that respondents with a low to high level of education may have intention to screen as compared to those with no formal education. A possible explanation for this outcome may be that women who are educated may have increased knowledge and understanding of health care services which may increase their level of self efficacy and decision-making power. Education seems to be an enabling factor that helps women to have a better understanding about cervical cancer as well as the screening facilities available. This is because women may be able to follow discussions about the

disease on the mass media and health facilities. They may also be in a better position to evaluate their level of risk concerning the disease. The level of educational attainment could facilitate decisions in accessing health services including cervical screening.

Table 7- *Binary Logistic Regression to Predict Intention to Seek Cervical Cancer Screening based on Socio-Demographic Characteristics*

Variables	n (%)	β	Wald	p-value	OR	95% CI for OR Lower	Upper
Level of Education							
High	93 (17)	1.15	7.97	0.005	3.16	1.42	7.02
Low	350 (65)	0.98	14.35	0.001	2.67	1.61	4.42
No Formal Education (Ref.)	97 (18)						
Marital Status							
Married	297 (55)	0.16	0.47	0.492	1.17	0.74	1.86
Not married (Ref.)	243 (45)						
Religion							
Christianity	486 (90)	0.09	0.06	0.808	1.09	0.55	2.18
Islam (Ref.)	54 (10)						
Age (in years)							
30 and above	427 (79)	0.11	0.15	0.704	1.12	0.63	2.00
Under 30 (Ref.)	113 (21)						
Employment Status							
Working	311 (58)	0.49	4.02	0.045	1.63	1.01	2.64
Not working (Ref.)	229 (42)						
Economic Ability to Afford Cervical Cancer Screening							
Affordable	255 (47)	0.22	0.68	0.411	1.25	0.73	2.13
Not affordable (Ref.)	285 (53)						
Constant		2.16	35.35	0.001	8.70		

Source: Field Survey, Ebu Enyan (2016)

Several studies (Baskaran et al., 2013; Bhagwan et al., 2007; Ezechi et al., 2013; Kahesa et al., 2012; Mc Farland, 2003; Mupepi et al., 2011; Sichanh et al., 2014; Sudenga et al., 2013; Williams et al., 2013) have affirmed education as

an important predictor of intention to screen and screening behaviour. The present finding is cosistentt with findings of these previous studies because the studies examined demographic factors that influenced cervical screening intention and behaviour of women. The studies were guided by the HBM and TPB constructs. It seems that the way in which level of education was measured in the present study was also consistent with that of previous studies (Bhagwan et al., 2007; Sichanh et al., 2014) and this has contributed to the outcome. The level of education is known to be a modifying factor as it is known to modify other constructs in the HBM. The level of education is an individual characteristic that can influence subjective perception (Glanz et al., 2002; Frank et al., 2004). It may also influence how a person perceives the seriousness of the disease as well as evaluate her level of susceptibility. This may also facilitate an individual's understanding of the perceived barriers about screening and how she can be overcome.

It has commonly been assumed that women with some level of education may have better chances of using maternal health care services compared to those without any formal education (Bhagwan et al., 2007; Kahesa et al., 2012; Park et al., 2011; Simou et al., 2010). The level of education of HIV-positive women can facilitate cervical screening intention in many ways. For instance, women with tertiary or high level of education may have increased self efficacy to use modern health care services, as they may be aware of its uses and benefits which may enhance decision making power and increased intention to use the services. Ihaji et al. (2014) asserted that education has a high tendency of

changing beliefs and unfavourable behaviours if interventions are designed and targeted to address specific notions in respect of health and illness.

The findings suggested that women with no formal education may not have the intention to seek cervical screening. It has been recognised that women who are illiterate or not had any form of education may have poor access to health services and lower quality of life. Importantly, they may delay in seeking health care, even when symptoms of the disease are obvious when compared to better educated women who may respond faster (Ihaji et al., 2014). Other empirical works (Chen et al., 2012b; Lee et al., 2013; Lyimo & Beran, 2012; Moser et al., 2009; Park et al., 2011; Simou et al., 2010) have affirmed the claim that illiterate women may be less likely to seek cervical screening. Despite the heterogeneity in the methodology and characteristics of the population employed in these studies, the findings suggest that women with no formal education may be at a high risk of contracting cervical cancer. It seems the level of education is an important factor that can impact the status of women. Education allows women to have improved socio-economic status and decreased morbidity and mortality as women become empowered to have conrol over the determinants of their health (Thomas, 2005).

The findings implied that some level of education is necessary for women to have positive attitudes and intention toward cervical screening. Cervical cancer screening education should be designed to target HIV-positive women, especially those who are not literate since they may be at an increased risk of developing the disease. Again, educational materials should be culturally appropriate to enhance understanding. Similarly, the promotion of education of

the female child and women for that matter may form an integral part in any efforts of ensuring positive health behaviours. Women who are not educated may not utilise health services as misconceptions and personal beliefs about it could be a barrier (Bhagwan et al., 2007; Mupepi et al., 2011). Therefore, the family, community, civil society and government should view female education as a priority in nation building. Perhaps when women are educated, it may impact positively on them, their family and the entire society.

Marital status did not significantly predict intention to screen in the present study ($p = 0.492$, OR = 1.17, [95% CI, 0.74-1.86]). This indicates that marital status was not a determinant of intention to screen. A possible explanation could be due to how this concept was measured in this study as those who were cohabiting were regarded as being in marital relationship. Additionally, respondents who have divorced and widows were added to single women and considered unmarried. The definition of marital status in this study could have influenced the outcome, as these categories of women may have different perceptions. It is plausible to assume that women who are not in marital relationships may be distressed by the cost of screening.

Although living with a partner affords one the opportunity to be physically and mentally sound, as there is a high tendency of partner support, the findings of the present study, however, suggested that marital status is not a critical factor to consider when designing cervical screening interventions for high risk women. This meant that whether sexual activity was found in marriage or otherwise, it may not be a necessary factor for HIV-positive women to reveal their intention to screen. It could also be due to the fact that there was not much

difference in intention between those who were married and the unmarried group.

This finding confirmed previous studies (Park et al., 2011; Sichanh et al., 2014; Simou et al., 2010) in which no significant relationship was found between those who were married and the unmarried in relation to cervical cancer screening intention. Although there was heterogeneity in the methodology employed in these studies, the results were similar to the present study due to the fact that the studies focused on women and the conceptual basis could be linked to the HBM. Ogunwale et al. (2016) explained that HIV-positive women who have not had cervical screening were younger and had multiple sexual partners or had ever had sexual intercourse with a man with multiple sexual partners. Abeliwine (2007) added that in Ghana, and other African societies, men tend to dominate over affairs of women at the household level including decisions about seeking preventive healthcare.

In Kenya and Zimbabwe, empirical evidence suggested that women were restricted by their husbands from engaging in cervical screening (Bingham et al., 2003; Mupepi et al., 2011). In Nigeria, marital status was found not to be a predictor of cervical screening uptake as women had abysmally low knowledge and poor perception of the disease (Abiodun et al., 2014). It is plausible to assume that having high knowledge about the disease may be necessary for it to be translated into screening intention. For instance, men may also require some knowledge about the disease to evaluate the seriousness of it and encourage their partners to participate in screening activities. In Ghana, the fact that marital status does not determine cervical screening intention could be assumed to have

strong biblical and contextual bases. In both situations, males are perceived as heads of the households. Consequently, their actions and inactions could affect the pattern of health seeking behaviours of their partners.

In contrast, the finding differs from that of Hyacinth et al. (2012), Limmer et al. (2014), Ncube et al. (2015) and Sudenga et al. (2013) in which marital status was a predictor of cervical screening intention with married women having higher probabilities of seeking screening. The difference could be that Hyancinth et al. selected participants by random sampling, the women were not HIV-positive and the sample size was small compared to that used in the present study. Similarly, measurement of marital status by Ncube et al. was not consistent with that of the present study as those divorced/widowed and singles were not combined but viewed as independent categories. These differences could affect the results and hence the inferences drawn from the findings.

In the United Kingdom, for instance, cervical screening utilisation was high among women in marital relationships and those who had separated (Sutton & Rutherford, 2005). This suggests that both the married and unmarried may have equal intention towards cervical screening. Nonetheless, spousal support from male partners has been found to influence intention to screen in women living with HIV (Ogunwale et al., 2016). In Tanzania, women who had support from their husbands participated in cervical screening (Lyimo & Beran, 2012). The finding implied that cervical cancer screening initiatives should focus on all HIV-positive women irrespective of their marital status. Again, a further study needs to explore marital-related factors that may influence intention to seek cervical screening by HIV-positive women.

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Similarly, respondent's religion did not significantly contribute to the prediction of intention to screen ($p = 0.808$, OR = 1.09, [95% CI, 0.55-2.18]). This could be explained from the perspective that the study was conducted in areas dominated by Christians, as 90% (n = 486) of the women with the intention to screen based on religion in this study were Christians. As a result, it could be that the respondents may be thinking alike. The result is consistent with that of Ezechi et al. (2013) and Modibbo et al. (2016) in whose studies religion did not predict cervical cancer screening intention. The categorisation of respondents' religion in these previous studies was similar to that of the present study and that may have influenced the outcome. Previous studies explained that in the African context, issues such as religious and cultural beliefs of modesty, cervical cancer being viewed as a curse from God and a shameful disease which is associated with immorality (Modibbo et al., 2016) could prevent women from obtaining cervical cancer screening. Again, male dominance over decisions including health care seeking, may create barriers for many women (Abeliwine, 2007).

The similarities between the present study and that of Ezechi et al. (2013) is that both studies focused on HIV-positive women's willingness or intention to seek cervical screening which was also in line with the conceptual frameworks that guided the present study. Although the present study used accidental sampling, Ezechi et al. used systematic random sampling which makes the results generalisable. However, a major weakness with this approach is that inherent ordering of the sampling frame could bias the sample obtained (Bryman, 2008). Additionally, Modibbo et al's (2016) study was conducted in Nigeria and is congruent with the present study as the study considered religion

and other factors that may lead to increased utilisation of cervical screening programmes.

Although the Christian doctrine is not against health promotion activities including cervical screening, some Muslim women with extremist views may never allow a male gynaecologist to examine or assist them even in child birth (Salman, 2012), which could hinder them from seeking care. In Ghana, some men consider it as a taboo for even male doctor to see another man's wife nakedness (Williams & Amoateng, 2015). This may be due to the belief that the private part of married women should be seen by only their husbands.

However, in a study among Latinas (Allen et al., 2014) and Jewish women (Benjamins, 2006), religion was a determinant of cervical screening utilisation. This meant that these women had gone beyond intending to seek screening to actually perform the behaviour. These findings do not support that of the present study due to differences in the methodology and settings as specific social and cultural factors could impact the findings. For instance, Benjamins analysed secondary data which has a serious weakness of variables or concepts being misunderstood. Allen et al. conducted a cross-sectional study in Massachusetts. However, the sample size of 97 was too small for any statistical inferences to be made. Other empirical works affirmed that religion is a predictor of cervical cancer screening in a study conducted among Nigerian (Dareng et al., 2015) and Hispanic (Leyva et al., 2015) women.

Women who attended religious programmes had higher chances of using cervical screening services (Benjamins, 2006). Dareng et al. (2015) found Christian women to have a high level of awareness when compared to their

Muslim counterparts in a study conducted in Nigeria. Muslim women were found to prefer self- sampling or collect their own cervical smear for cervical cancer screening than Christians. This suggested that by virtue of religion, Muslim women may not want any man to see their private part even for health reasons. A possible weakness of this study is that it was conducted in areas dominated by Christians. Convenience sampling was used which may have affected the conclusions drawn.

In Ghana, it seems religion is not a determinant of cervical screening intention since there is no huge gap in intention to seek cervical screening between Muslims and Christians. The findings suggested that both Christians and Muslims have equal chances of having cervical screening intention or otherwise. The finding has implications for health promotion. There is the need for cervical cancer screening initiatives to be culturally appropriate and designed to target HIV-positive women irrespective of their religious backgrounds. A further qualitative study needs to explore the influence of religion on the intention to seek cervical cancer screening.

In addition, the results of the binary logistic regression analysis in Table 7 indicate that age was not a significant predictor of intention ($p = 0.704$, OR = 1.12, [95% CI, 0.63-2.00]). The finding suggests that age is not a determinant of cervical cancer screening intention. A possible explanation for this outcome could be how age was measured in this study as it was dichotomised into those under 30 and above 30 years. It could also be related to the fact that 79% (n = 427) of HIV-positive women with intention to screen were aged 30 years and above. Therefore, there may have been little variability in intention. Another

from HPV are normally present in young women (Jakobsson et al., 2007; Kyrigiou et al., 2006; Noehr et al., 2009; Poon et al., 2012). However, these changes are harmless in this category of women. There is the danger of the young woman being predisposed to preterm deliveries in the event that she wants to have children (Noehr et al.; Poon et al.) and the entire cervical screening procedure may create undue anxiety (National Health Service UK, 2014).

In contrast, Bhagwan et al. (2007) and Were et al. (2011) found women aged 30 years and above to have intention compared to the under 30 year olds. The finding of the present study differs from that reported by Bhagwan et al. and Were et al. in terms of the population characteristics and the sampling methodology employed as the women were not HIV-positive. Bhagwan et al. conducted a randomised control trial in generating the evidence in India. A major strength of this approach is that the findings can be generalised to other populations. Were et al. conducted a hospital based study but the sample size was small compared to the present study. This may have impacted the conclusions drawn from the study.

The present finding contrasts that of previous studies because in Ghana, HIV-positive women may face challenges in accessing health care services owing to the fear of other health workers getting to know of their status as HIV is a highly stigmatised disease. Nonetheless, in settings where stigma reduction strategies have been effective, there may be a high tendency of these women engaging in health promoting activities. For instance, in Senegal, HIV-positive women who were 30 years and above, were willing to adhere to actions that could promote health because they had accepted the diagnosis of HIV and

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from HPV are usually present in young women (Jakobsson et al., 2007; Kyrigiou et al., 2006; Noehr et al., 2009; Poon et al., 2012). However, these changes are harmless in this category of women. There is the danger of the young woman being predisposed to preterm deliveries in the event that she wants to have children (Noehr et al.; Poon et al.) and the entire cervical screening procedure may create undue anxiety (National Health Service UK, 2014).

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recognised that mortality associated with cervical cancer is seen in older women (Holmes et al., 2009). The finding implied that cervical screening initiatives should target all women who are eligible for screening. All HIV-positive women are at high risks of developing cervical cancer regardless of their ages. Amid limited resources, there is the need for cervical screening interventions to be directed at the factors that determine screening intention rather than age.

Furthermore, employment status did not significantly contribute to the prediction of intention to screen ($p = 0.045$, OR = 1.63, [95% CI, 1.01-2.64]). A possible explanation for this outcome is that though employment provides a sense of self esteem and could result in personal fulfillment, HIV-positive women may lack knowledge about cervical cancer and they may also have specific barriers regarding screening. It was seen that 42% (n = 229) of HIV-positive women with the intention to screen in this study were not working. The fact is that these women were not in any formal or informal sector job which could affect their perception of the benefits, barriers and even cues about the disease. The finding confirms that previously reported by Matejic et al. (2010) and Hoque et al. (2008) where employment status was not a determinant of screening. The current finding is consistent with that of Hoque et al. as they conducted a cross-sectional survey, used large sample size and the population characteristics were comparable to that used in the present study. Similarly, Matejic et al. recruited participants from primary health care facilities to investigate the determinants of preventive health actions in regards to cervical screening. The focus of the study, age group of participants and characteristics may account for the consistency in findings.

The findings suggested that employment may not guarantee the intention to participate in a health promotion activity. This meant that other important factors could influence intention. It seems HIV-positive women encounter unique problems including stigma, discrimination and fear of obtaining a positive cervical screening result (Ezem, 2007; Ndikom & Ofi, 2012; Oche et al., 2013; Were et al., 2011) despite being in active employment and having the financial resources for health. Similarly, the researcher argued that the high possibility of other health workers getting to know of their HIV status may deter some HIV-positive women from revealing their intention to screen. Additionally, in Ghana, most women are not able to take independent decisions regarding their health and health care seeking behaviour despite being gainfully employed as the position of women is considered to be subservient to that of men (Amu, 2005; Archampong, 2010). Consequently, men tend to make the most important decisions at the household level which could potentially deny women of equity and dignity (Abeliwine, 2007). Ardayfio-Schandorf (2005) explained that the socilisation processes of the female child and women in the Ghanaian culture and the strict traditions can deprive women of having high status which can affect their pattern of health care seeking.

Employment status is an individual characteristic that can be modified by the constructs of perception in the HBM (Glanz et al., 2002). It is assumed that when HIV-positive women are not working or unemployed, they may have a high perception of the barriers. As a result, they may not be able to access information about the disease which can affect their perception of susceptibility and seriousness of the disease. Other empirical works found employment status

to be significantly associated with the intention to screen and likelihood of screening (Labeit et al., 2013; Olesen et al., 2012; Twinomujuni et al., 2015) in women who were not infected with HIV.

The inconsistencies in findings may emanate from the methodology, geographical differences and characteristics of the population. Labeit et al. (2013) conducted secondary data analysis of large survey data conducted in the United Kingdom. The differences in socio-economic conditions across countries may possibly explain the findings. The studies conducted by Olesen et al. (2012) and Twinomujuni et al. (2015) were community-based. They made use of large representative samples which make the findings generalisable to other populations compared to the current study that made use of accidental sampling. Moreover, the studies involved women who were not HIV-positive. Therefore, these differences could impact the findings. Wang and Lin (1996) found unemployment as a factor that hindered the use of cervical screening services. The present finding contradicts that of previous studies probably due to several reasons. It seems that some HIV-positive women are not gainfully employed and as a result, may have low socio-economic status. It is also plausible to assume that those who are working may not have sufficient financial resources and power to decide to seek screening.

The implication of this finding for health promotion of HIV-positive women is that cervical screening initiatives should be friendly for all HIV-positive women regardless of their employment status. There is the need for a further study to explore the employment-related factors that may facilitate cervical screening intention in women living with HIV.

Furthermore, the economic ability to afford the cost of cervical cancer screening did not significantly contribute to the prediction of intention to screen as indicated in Table 7 ($p = 0.411$, OR = 1.25, [95% CI, 0.73-2.13]). This result shows that economic ability to afford the cost of screening was not a determinant of the intention to screen. A possible explanation for this outcome is that HIV-positive women may have unique challenges regarding cervical screening as 53% (n = 285) of HIV-positive women with intention to screen perceived the cost as not being affordable. It could be that they may not be able to afford the cost of screening as they may have perceived it to be too high or there are other barriers that may hinder them from revealing their intention to screen.

The finding is consistent with that of Akinyemiju et al. (2015), Ezechi et al. (2013) and Were et al. (2011) in which the economic ability to afford the cost screening did not result in cervical screening intention. The similarities in findings are that Were et al. conducted a hospital-based study and the participants were women who accessed family planning services in Kenya. These participants may have similar characteristics with those involved in the current study. In Kenya, HIV and cervical screening programmes have been integrated (Huchko et al., 2011). The focus of the study conducted by Ezechi et al. was in line with the current study. Therefore, the consistency in findings could emanate from the theories that guided the studies as well as how concepts were measured. In the same way, Akinyemiju et al. conducted secondary data analysis of South African World Health Survey. However, it seems the socio-economic conditions of women in South Africa may be similar to that of Ghana which could have resulted in the conclusions drawn from the study.

The economic ability to afford the cost of screening is a factor which has the potential of modifying the perception constructs in the HBM (Glanz et al., 2002). The low socio-economic status and self esteem of HIV-positive women can impact utilisation of health services (Amu, 2000). Previous studies found cost of screening to be a critical barrier to screening (Beining, 2012; Eze et al., 2012; Sutton & Rutherford, 2005; Thippeveeranna et al., 2013). This is because women perceived the cost associated with obtaining cervical screening to be high. Kuroki (2012) asserted that women may be willing to have cervical screening if employers pay for the cost of screening. This calls for an urgent need for women to be supported to avail their intention to screen (Fort et al., 2011). For instance, in Ghana, although women play a critical role in nation building and form approximately 50% of the workforce, they are mostly involved in informal sector jobs including trading and farming and only 1% are in administrative positions in the public sector (GSS, 2012). This suggests that it may be difficult for HIV-positive women to pay for the cost of cervical screening which ranges from 50 to 80 Ghana cedis.

Nonetheless, previous studies reported that women who are gainfully employed may be able to afford the cost of health services compared to those who are not (Labeit et al., 2013; Olesen et al., 2012; Twinomujuni et al., 2015). They may be able to overcome the barriers related to cervical screening accessibility and affordability. The differences in findings between the present study and that reported by Labeit et al., Olesen et al. and Twinomujuni et al. could be due to methodological heterogeneity. An important implication of the finding of this study is that being able to afford the cost of cervical screening is

not a determinant of intention to screen. The finding implied that services provided for HIV-positive women should include cervical cancer screening to enable all high risk women have access to screening.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of the study was to assess the levels of knowledge of HIV-positive women about cervical cancer and screening, determine the extent to which perceived susceptibility, seriousness, benefits, barriers, and cues about cervical cancer screening influence intentions to obtain screening test, and to identify the demographic factors that influencing intentions of HIV-positive women to seek cervical screening in the Central Region of Ghana. This chapter focuses on the summary, conclusions and recommendations of the study.

Summary

Cervical cancer is a leading malignant disease that affects women, especially those with HIV-positive status. It is a disease of global public health concern and high rates of morbidity and mortality have been recorded in sub-Saharan cultures owing to the high rate of HIV infection and immunosuppression that accompanies the disease. Nonetheless, the disease is preventable as there are technologies including Pap test, VIA and HPV-DNA available to detect the disease early for appropriate interventions to be initiated. The WHO guidelines posit that all sexually active women require cervical screening due to increased risk of developing the disease. In Ghana, VIA is recommended for women between 25 to 45 years of age and Pap test for those aged above 45 years. However, the health system is not sufficiently equipped to perform HPV-DNA test. In the area of treatment, most of the regional hospitals in the country have facilities for chemotherapy and surgical management of the disease.

Cervical cancer screening remains an important and fundamental public health intervention that can decrease risk, morbidity and mortality associated

with the disease. To understand the factors influencing the intention to obtain cervical cancer screening by HIV-positive women in the Central Region of Ghana, a descriptive cross-sectional study was conducted with 660 HIV-positive women attending HIV/AIDS clinics in the Central Region of Ghana from mid-March to mid-May 2016. HIV-positive women who volunteered to participate in the study were interviewed, using interviewer-administered questionnaire. The research instrument was guided by constructs from the HBM and TPB. Five HIV/AIDS care providers were trained to assist with the data collection. Ethical clearance for the study was obtained from the Institutional Review Board of the University of Cape Coast and Ethical Review Committee of the Ghana Health Service. Approval was also sought from the Ethical Review Committee of the Cape Coast Teaching Hospital. The data obtained were analysed using frequencies, percentages and binary logistic regression analysis.

Main Findings

The findings revealed that:

1. HIV-positive women with moderate to high knowledge about cervical cancer screening had the intention of seeking cervical cancer screening than those with low knowledge.

2. HIV-positive women with high cues had the intention to seek cervical cancer screening than those with low cues.

3. HIV-positive women with high perceived seriousness of the disease had the intention to screen than those with low perceived seriousness.

4. HIV-positive women with high perceived benefits about cervical cancer screening had the intention to screen for cervical cancer than those with low perceived benefits.

5. HIV-positive women with low to high level of education had the intention to seek cervical cancer screening than those with no formal education.

6. Knowledge about cervical cancer did not influence intention to screen

7. Perceived susceptibility to cervical cancer did not influence intention to screen.

8. Perceived barriers to cervical cancer screening did not determine intention to screen.

9. Socio-demographic factors; age, marital status, religion, employment, and economic ability to afford the cost of screening did not determine intention to seek cervical cancer screening by HIV-positive women in the Central Region of Ghana.

Conclusions

Although the existing literature on cervical cancer and screening support the theoretical positions of the HBM and TPB constructs in predicting cervical cancer screening intention, the findings of the present study suggest that not all the HBM constructs predict intention of HIV-positive women to engage in cervical cancer screening, especially when all the constructs are assessed spontaneously. In reality, none of the HBM and TPB constructs and modifying factors works in isolation. Human beings are complex, so are their perceptions, which could be influenced by several factors.

It could be deduced from the findings of the current study that when HIV-positive women are educated about cervical cancer screening including the seriousness and benefits of participating in screening activities they may have better chances of utilising screening services. It is critical that cues about the screening are intensified to facilitate access to essential information. Nonetheless, it is evident that HIV-positive women may have barriers that could hinder intentions to screen and subsequent attempt to utilise cervical screening. This highlights the fact that the perceived barrier construct in the HBM actually impedes intention to screen.

Despite evidence that perceived susceptibility influences intention to screen, the current study proposes that perceived susceptibility may not commit HIV-positive women to have the intention to screen. This implies that education on cervical cancer screening for HIV-positive women needs not to strongly focus on their level of perceived susceptibility since it may not be a crucial factor in determining intentions to screen. Similarly, it seems that knowledge about cervical cancer may not be a sufficient factor that will enable women to have intention to screen when considering cervical cancer prevention strategies.

Again, for the modifying variables in the HBM, aside level of education, there was lack of prediction for age, marital status, employment status, religion, and economic ability to afford the cost of cervical cancer screening. This suggests that the applicability of the HBM and TPB constructs to HIV-positive women in the Ghanaian context may require further evidence. The HBM and TPB are western models and few studies in other African countries have applied the constructs. It seems the current study is the first to test the constructs among

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HIV-positive women in the Central Region of Ghana. Also, it seems there has not been any existing evidence on cervical cancer screening among HIV-positive women in Ghana. Consequently, there is the need for further exploration of these factors in determining cervical cancer screening intention of HIV-positive women.

The findings of this study have raised numerous issues which have implications for clinical practice, research and policy on health promotion of women living with HIV regarding cervical screening. The findings of the study suggested that HIV-positive women with low knowledge about cervical cancer screening, low perceived seriousness, low perception about the benefits of engaging in screening, low cues, and no formal education may not have the intention to seek cervical cancer screening which could affect efforts to prevent cervical cancer among high risk women. This means that health-promoting programmes including cervical cancer screening for HIV-positive women should be designed to target the most vulnerable groups.

It is also imperative that cervical cancer screening initiatives for HIV-positive women are designed to enhance knowledge about cervical cancer screening, increase perception of seriousness of the disease, benefits and cues as these factors could increase the intention and potentially facilitate utilisation of screening services. It could also be assumed that when screening services are provided for HIV-positive women they may use it since knowledge about cervical cancer screening could lead to intention to screen. The findings implied the need for a policy on cervical cancer screening to facilitate access to screening services.

Recommendations

The findings have important implications for clinical practice, policy on cervical cancer screening and research. It is recommended that:

1. The CRHD/MOH/GHS and non-governmental agencies with a special focus on the health of HIV-positive women need to intensify public health education on the seriousness or complications of the disease and benefits HIV-positive women are likely to derive from engaging in cervical cancer screening.

2. Education of women or the female child should be made a high priority by the government since women with some form of formal education have higher chances of having intention to seek cervical screening than those with no formal education.

3. The CRHD/MOH needs to develop a policy that could enable HIV-positive women have access to information on cervical cancer screening.

4. Cervical cancer screening interventions should be designed by the CRHD to target all HIV-positive women in the Central Region of Ghana.

5. Efforts should be made by the government and important stakeholders to remove access barriers including geographical and financial challenges HIV-positive women encounter.

It is recommended that further research should:

1. Explore the lived experiences of HIV-positive women about cervical cancer.

2. Explore the meaning and interpretation high risk women give to susceptibility to cervical cancer.

3. Employ a true randomised controlled trial to address any methodological flaws.

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APPENDICES
APPENDIX A: QUESTIONNAIRE ON CERVICAL CANCER SCREENING

Dear participant,

I am Nancy Ebu, a PhD student of the University of Cape Coast in the Department of Health, Physical Education and Recreation. I am conducting a study on the topic **"Factors influencing intention to obtain cervical cancer screening by HIV-positive women in Central Region of Ghana".** I seek your assistance to complete a questionnaire for me. The questionnaire will take approximately 15-20 minutes. Your participation is voluntary and anonymous. The results of the research may be published, but your name will not be used and no individual identifying information will be provided. You are free to refuse to take part in the study or withdraw at any point of the process. If you have any questions concerning the project or your participation in this study, please contact me (0503270088) or my supervisor, Prof. Joseph Ogah on 0243102322.

Yours Sincerely,

Nancy Ebu

I have read the above information. The nature, demands, risk, and benefits of the research have been explained to me. I understand that I may withdraw my consent and discontinue participation at any time without penalty or loss of benefit to myself.

Date.....................

Participant's signature...............................

SECTION A

Please respond to each item by ticking [✔] Yes, No or Don't know in the appropriate box.

Items	Yes	No	Don't Know
1. What is cervical cancer?			
a. Cancer that affects the mouth of the womb			
b. Cancer that affects the face			
c. Cancer that cannot be prevented			
2. Which of the following are risk factors for cervical cancer?			
a. Being transfused with blood			
b. Having multiple sexual partners			
c. Heredity			
3. What are the signs and symptoms of cervical cancer?			
a. Bleeding after sexual intercourse			
b. Offensive blood- stained vaginal discharge			
c. Itching around the vulva			
d. Severe headache all the time			

Please respond to each item by ticking [✔] Yes, No or Don't know in the appropriate box.

4. Statements	Yes	No	Don't know
a. Screening can prevent cervical cancer			
b. Screening can cure cervical cancer			
c. Urine is used for cervical screening			
d. Screening must be done by trained person			
e. Screening cannot be obtained in Ghana			

4. Do you intend to have cervical screening again or for the first time?

   a. Yes [ ]   b. No [ ]

Please indicate the extent to which you agree or disagree to the statements below by ticking [✔] strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD) in the appropriate box.

5. STATEMENTS	SA	A	D	SD
a. I worry about developing cervical cancer				
b. I had a relative with cancer, so I may get cervical cancer				
c. I don't think I can get cervical cancer				
d. I had multiple sexual partners in the past, so I may get cervical cancer				
e. I have been in a polygamous relationship in the past, so I may get cervical cancer				
f. I may not get cervical cancer because I already have HIV				
g. I think I may get cervical cancer sometime in my life				
h. I do not feel at risk of getting cervical cancer				

6. STATEMENTS	SA	A	D	SD
a. Cervical cancer makes life worse				
b. Cervical cancer makes it difficult to have sex				
c. Cervical cancer patients may die within a short time				
d. Cervical cancer is more serious than other diseases				
e. The problems caused by cervical cancer remain for a long time				

		SA	A	D	SD
f.	Cervical cancer makes patients anxious all the time				
g.	Many women with cervical cancer may have complications				
h.	Cervical cancer mainly affects sexually active women				

7.	**STATEMENTS**	SA	A	D	SD
a.	Screening can find cervical changes before they become cancer				
b.	If cervical changes are found early they are easily treatable				
c.	Screening test will help a woman to know if she has cervical cancer				
d.	Screening cannot prevent the spread of cervical cancer				
e.	Screening cannot save the patient's life				
f.	Cervical screening may cause infertility				
g.	If I had cervical screening, I would never get cancer				
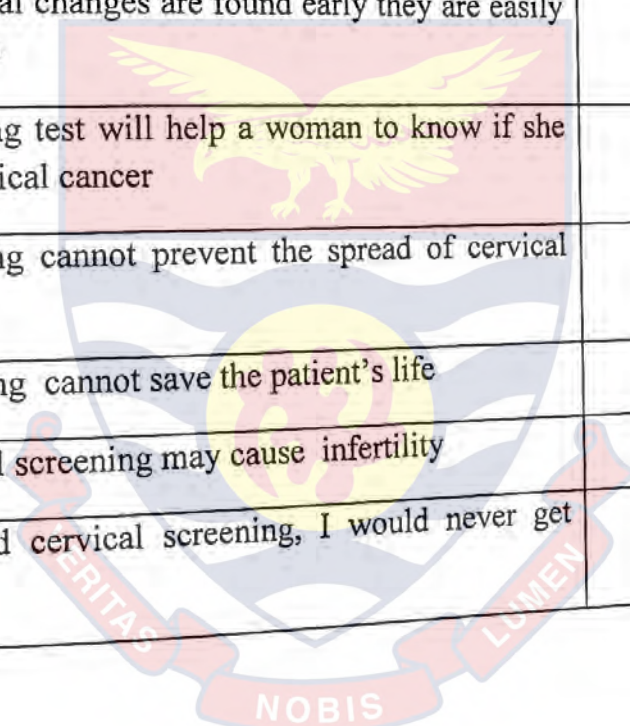
8. STATEMENTS

	SA	A	D	SD
a. Education on the need for cervical cancer screening at the hospital will encourage me to have the test				
b. If a relative suffers from cervical cancer, it will discourage me from obtaining the screening				
c. If I hear about cervical cancer screening on the radio and television, I will go for the test				
d. If I am referred for cervical screening by my doctor, I will obtain the test				
e. If a doctor/nurse reminds me, I will obtain the test				

9. STATEMENTS

	SA	A	D	SD
a. I know where to go for cervical cancer screening				
b. I don't have much information about cervical cancer				
c. The screening centres are too far from where I live				
d. Cervical cancer screening would be embarrassing				
e. Cervical screening would be painful				
f. Cervical screening is against my religious beliefs				
g. I am afraid of knowing that I have cancer				
h. I cannot afford the cost of screening				

SECTION B

SOCIODEMOGRAPHIC INFORMATION

10. How old are you...

Instruction: Read the questions carefully and tick [✓] the most appropriate option.

1. What is your marital status?
    a. Single   [ ]
    b. Married   [ ]
    c. Divorced   [ ]
    d. Widowed   [ ]
    e. Cohabiting   [ ]

2. Religion
    a. Christianity   [ ]
    b. Islam   [ ]
    c. Traditional   [ ]
    d. Other, please specify.........................

3. Level of education?
    a. Primary   [ ]
    b. Secondary   [ ]
    c. Tertiary   [ ]
    d. No formal education [ ]

4. Employment status?
    a. Employed   [ ]
    b. Unemployed   [ ]
    c. Student   [ ]
    d. Retired   [ ]

5. If cervical cancer screening costs 50-80 Ghana cedis, will it be affordable to you?
    a. Very affordable   [ ]
    b. Fairly affordable [ ]
    c. Not affordable   [ ]

Thank you for taking the time to participate in the study.

APPENDIX B: ETHICAL CLEARANCE UNIVERSITY OF CAPE COAST

UNIVERSITY OF CAPE COAST
INSTITUTIONAL REVIEW BOARD
SECRETARIAT

TEL: 03321-33172/3 / 0207355653/ 0244207814

E-MAIL: irb@ucc.edu.gh

OUR REF: UCC/IRB/3/40

YOUR REF:

C/O Directorate of Research, Innovation and Consultancy

11ᵀᴴ JANUARY, 2016

Ms. Nancy Innocentia Ebu
Department of Health, Physical Education and Recreation
University of Cape Coast
Cape Coast

Dear Ms. Ebu,

ETHICAL CLEARANCE –ID NO: (UCCIRB/CES/2015/04)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted **Provisional Approval** for implementation of your research protocol titled **"Factors influencing intentions to obtain cervical Cancer Screening by HIV-positive women in Central Region of Ghana."**

This approval requires that you submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

Please note that any modification of the project must be submitted to the UCCIRB for review and approval before its implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol

Yours faithfully,

Samuel Asiedu Owusu
Administrator

cc: The Chairman, UCCIRB

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST
Date:.......1/11/16...............

APPENDIX C: ETHICAL CLEARANCE FROM GHS

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the
number and date of this
Letter should be quoted.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: Hannah. Frimpong@ghsmail.org

My Ref. GHS/RDD/ERC/Admin/App/16/02
Your Ref. No.

3rd February, 2016

Ebu Nancy Innocentia
Department of HPER
University of Cape Coast
Cape Coast

ETHICS APPROVAL - ID NO: GHS-ERC: 07/01/16

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of
your Study Protocol titled:

**"Factors Influencing Intention to Obtain Cervical Cancer Screening by HIV-Positive Women in
Central Region of Ghana"**

This approval requires that you submit yearly review of the protocol to the Committee and a final full review to
the Ethics Review Committee (ERC) on completion of the study. The ERC may observe or cause to be observed
procedures and records of the study during and after implementation.

Please note that any modification without ERC approval is rendered invalid.

You are also required to report all serious adverse events related to this study to the ERC within three days
verbally and seven days in writing.

You are requested to submit a final report on the study to assure the ERC that the project was implemented as per
approved protocol. You are also to inform the ERC and your sponsor before any publication of the research
findings.

Please note that this approval is given for a period of 12 months, beginning 3rd February, 2016 to 2nd February, 2017.
However, you are required to request for renewal of your study if it lasts for more than 12 months.

Please always quote the protocol identification number in all future correspondence in relation to this approved
protocol

SIGNED...................................
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra

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APPENDIX D: APPROVAL FROM CAPE COAST TEACHING HOSPITAL

THE HEAD
COLLEGE OF EDUCATION STUDIES
UNIVERSITY OF CAPE COAST
CAPE COAST

Dear Sir,

RE: LETTER OF INTRODUCTION — MRS. NANCY INNOCENTIA EBU ENYAN

With reference to your letter number ED/HTP/14/0001/9, dated 1st March 2016 on the above subject, I write to inform you that the Cape Coast Teaching Hospital (CCTH) has granted approval for the above named student to collect data for their research in partial fulfilment of the requirements for the programme.

The student will be required to pay an amount of Two Hundred Ghana Cedis (GH¢200.00) to enable the hospital support the Ethical Review Committee to monitor the research to make sure it aligns to the ethics regarding patient confidentiality and other ethical consideration.

The hospital would also appreciate to have a copy of any relevant findings.

Thank you.

Yours faithfully,

DR. ERIC K. NGYEDU
(MEDICAL DIRECTOR)
FOR: CHIEF EXECUTIVE OFFICER

APPENDIX E: CONSENT FORM

Title of project: Factors influencing intention to obtain cervical cancer screening by HIV-positive women in Central Region of Ghana

Name of principal investigator: Nancy Innocentia Ebu, a PhD student in the Department of Health, Physical Education and Recreation, University of Cape Coast, Cape Coast.

Address: University of Cape Coast, College of Education Studies, Department of Health, Physical Education and Recreation, University of Cape Coast, Cape Coast.

Local telephone number: 0503270088/ 0541145193

Email: nancysrn@rocketmail.com

Nature of research: Cervical cancer is a leading cause of death among women in Ghana. It is known that HIV-positive women are at higher risk of developing cervical cancer. However, cervical cancer is preventable when the disease is detected early. The study will focus on intention of HIV-positive women about cervical cancer screening. The study is interested in finding out the factors that can predict HIV-positive women's intention to have cervical cancer screening in the Central Region of Ghana.

Participants' involvement: Participants will be required to complete a questionnaire which takes approximately 15-20 minutes.

Potential Risks: Participating in this study will not result in any physical risk or harm, but participants are cautioned that some of the questions may cause some discomforts.

Benefits: The direct benefit of this study to the participants is that, the findings will be shared with the participants. The study will empower HIV-positive women with the necessary information they need to make an informed choice about cervical cancer screening. The study can help the Ministry of Health and other relevant stakeholders formulate policies that would encourage cervical cancer screening among HIV-positive women. This will help in reducing risk of cervical cancer and promote the health of HIV-positive women. It will inform stakeholders to target interventions to the most vulnerable group to reduce the prevalence of cervical cancer. The study will contribute to broad knowledge on how HIV-positive women's health can be improved.

Compensation/Payment: Participants will not be remunerated for participating in the study.

Costs: The participants will not incur any costs as a result of participating in this study. This is because the study will be conducted during clinic days designated for people living with HIV/AIDS.

Confidentiality: Participants will be told that responses will be anonymous and confidential. Identification numbers will be given and personal information such as names and addresses will not be required on the questionnaire. The data will be kept under lock and key and destroyed after 10 years.

Voluntary participation/withdrawal: Participation is voluntary. Participants have the right to withdraw from the study any time without penalty.

Outcome and Feedback: The outcome of the research will be shared with the participants. It will also be shared with the Ministry of Health and other stakeholders concerned with the health HIV-positive women.

VOLUNTARY AGREEMENT

The above document describing the benefits, risks and procedures for the research title *(Factors influencing intention to obtain cervical cancer screening by HIV-positive women in Central Region of Ghana)* has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate in the study as a volunteer.

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Date   Mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

_____   _____

Date   Name and signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

_____   _____

Date   Name Signature of Person Who Obtained Consent

APPENDIX F: STAFF CONFIDENTIAL STATEMENT

To be completed by all research staff members

I promise not to discuss or reveal any information obtained during my participation in the project **"Factors influencing intention to obtain cervical cancer screening by HIV-positive women in the Central Region of Ghana"** to anyone other than the staff participating in this project.

Name of Staff Member

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