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Papanicolaou Test Status Among Inner-City Adolescent Girls in Accra, Ghana

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This is to certify that the doctoral dissertation by

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Abstract

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MPH, Rutgers University-School of Public Health, 2008

BS, Bloomfield College, 2005

AS, Essex County College, 2004

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Public Health

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Abstract

Cervical cancer is an emerging public health problem in developing countries. Globally, it is the 3rd most common malignancy in women after breast and colorectal cancers and 4th most frequent cancer in women, with an estimated 570,000 new cases and 311,000 deaths in 2018. Cervical cancer screening in the developed countries is credited with the reductions in cervical cancer morbidity and mortality during the last 50 years. However, nearly 90% of cervical cancer deaths occur in less developed countries. Ghana has a cervical cancer rate of 26.4%. Further, it is the highest cancer incidence faced among women 25 to 44 years and has a mortality rate of 17.4% in this age group. Knowledge, culture, attitude, and beliefs are known to limit women's participation in Pap test screening programs. Guided by the health belief model, the purpose of this quantitative study was to examine how knowledge, attitude, culture, and religious beliefs affected intent to seek Pap test screening among adolescent girls in Accra, Ghana. A total of 155 participants ages 16 to 20 years completed a 30-item questionnaire. Descriptive frequencies were calculated. Correlation and Chi-square tests were also performed to assess associations with intent to screen with Pap test. Most girls (92%) had never heard about Pap test screening. There were statistically significant correlations between cervical cancer knowledge (p=0.032) and attitude (p=0.001) with intent to participate in Pap test screening. However, culture (p=0.049) and religious beliefs (p=0.529) were not significantly associated with screening intent. The implications for social change include informing practice and research on how cervical cancer prevention programs can be tailored to girls living in countries where different cultural and religious values are practiced.

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Dedication

Philippians 4: 13 states that I can do all things through Christ who strengthens me and Mathew 19:26 states that with man this is impossible but with God all things are possible. Yes, these two biblical verses kept me strong and motivated to come this far.

I dedicate this Dissertation to God Almighty who has been my provider, counselor, and led me throughout my stay and studies here in the United States of America. Lord, without you I am nothing. To you and only you be the glory, Amen.

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Chapter 1: Introduction to the Study

Introduction

Cervical cancer poses public health problems in women worldwide. Globally, it is the fourth most common malignancy among women after breast cancer, colorectal, and lung cancer (Bray, et al., 2018). In addition, it is the fourth most common cancer death among women worldwide, with an estimated 570,000 new cases in 2018 (Bray, et al., 2018; World Health Organization [WHO], 2018). Approximately, 84% of the new cases occurred in women living in less developed countries (WHO, 2018). Global cervical cancer deaths are higher in populations where women lack access to routine Pap test screening and are usually diagnosed with late stage cervical cancer, rather than precancers, where the disease is incurable (WHO, 2013 b). In fact, it is the second most common cancer in women living in less developed countries (Ferlay et al., 2018; WHO, 2018). In 2018, about 311,000 women died from cervical cancer globally, and more than 85% of these deaths occurred in less developed countries (WHO, 2018). Almost 270,000 women die annually from cervical cancer, of which more than 85% of these cases occur in countries with limited resources (WHO, 2018). It is estimated that it could affect as many as 750,000 women by 2020, and as many as 1 million new cases by 2050 (WHO, 2005). Globally, Sub-Saharan Africa has the highest burden of mortality associated with cervical cancer where women have low survival rates compared to women in developed countries (WHO, 2010 c; 2013 a). In 2012, there were an estimated 93,278 newly diagnosed cervical cancer and 57,381 cervical cancer deaths in the Sub-Saharan Africa (Parkin, Bray, Ferlay, & Jemal, 2014).

In Ghana, cervical cancer is the most common cancer death among women of all ages, including adolescents (Parkin, et al., 2014). Pap test screenings have been documented to reduce the incidence and mortality rates of cervical cancer (ACS, 2018; CDC, 2018; WHO, 2018). Knowledge, culture, attitude, and health beliefs are shown to affect screening and preventions of cervical cancer (Binka, Nyanko, & Doku, 2016; McCaffery et al., 2003). Many researchers have documented that knowing about what cervical cancer is and risk factors as well as where to get screening services can help females to seek preventive care and treatment (Ali-Risasi et al., 2014; Bessler, Aung & Jolly, 2007). In addition, cultural practice, individual perception or attitude, and beliefs about the disease can influence women's decisions to seek preventive care or treatment (Bessler, Aung & Jolly, 2007; Chen & Kaphingst, 2010; Gerend & Magloire, 2008; Were, Nyaberi & Buziba, 2011; McCaffery et al., 2003). However, Ghanaian adolescents' knowledge, attitude, cultural, and religious beliefs about cervical cancer screening were unknown. In this study, I determined how these factors affected intent to seek Pap test screening among adolescent girls in Ghana.

Background of the Study

Several studies have shown Pap test uptake is affected by knowledge, cultural practice, attitude, and beliefs (Ackerson, 2012; Binka, Nyarko & Doku, 2016; Grissinger, 2007; Ibekwe, Hoque, Ntuli-Ncobo & Hoque, 2011). Researchers have documented that most women seek Pap tests when they have knowledge about it and believe that the test is beneficial, and within the "norms "of their cultural practices (Binka et al., 2016; Ibekwe et al., 2011; McCaffery et al., 2003; Rosario, 2010). Cervical cancer incidence and deaths

over last 50 years have been substantially reduced due to Pap test screening (CDC, 2012; WHO, 2018). However, the story is different in developing countries due to little or lack of effective cervical cancer screening programs. In Ghana, for example, there is no national cervical screening program. Ghana is a polygamous, multicultural society with varying religious beliefs, and these factors can affect screening status among females, yet little is known about how knowledge, culture, attitude, and beliefs affect Ghanaian women's Pap test screening status. In this study, I examined the correlation between knowledge, culture, attitude, religious beliefs, and intent to cervical cancer screening among adolescent high school girls in Accra, Ghana. More information about the risk factors and methodology are provided in Chapters 2 and 3 respectively.

Problem Statement

Adolescents are at greatest risk of sexually transmitted diseases (STDs), and behaviors that involve sexual risk taking have numerous health risk outcomes, including HIV, unplanned pregnancies, and human papillomavirus (HPV);(CDC, 2012; WHO, 2018). Researchers have shown that adolescents, in particular, are at high risk of these adverse health consequences. Adolescents' sexual and reproductive health are important public health issues in Sub-Saharan Africa and may have implications on policy, practice, and research. The region continues to be the most affected by STDs (WHO, 2010a). The UNAIDS estimated that in 2011, the region accounted for 1.9 million (73%) of the 2.7 million new HIV infections worldwide (UNAIDS, 2012). Globally, AIDS-related illnesses remain the leading cause of death among women of reproductive age (15-49 years) and they are the second leading cause of death among young women aged 15–24

years in Africa (UNAIDS, 2017; WHO, 2016). Most adolescent girls in Ghana do not use condoms or do not use them consistently during sexual intercourse, which increases their risk of STD infections (Ohene & Akoto 2008), such as HPV and cervical cancer. In Ghana, cervical cancer is the highest cause of death among all women aged 15 to 44 years (WHO, 2010a). Studies have shown that little is known about women's knowledge and beliefs about cervical cancer screening in Ghana (Abotchie & Shokar, 2009). Despite the remarkable progress made in reducing the incidence of cervical cancer in the United States and in developed countries, it remains the fourth most common cancer in women globally (CDC, 2011a;WHO, 2013c; 2018). In order to provide prevention and intervention programs, researchers have tried to find risk factors that influence adolescent sexual risk behavior. Researchers have shown that using models and perceptions are too narrow and are not conducive to the difficulties associated with adolescents' sexual practices (Kotchick, Staffer, Miller & Forehand, 2001) and cervical cancer screening status (Ibekwe et al., 2011). Reviews of the literature have indicated that little is known about Ghanaian adolescents' knowledge, attitude, cultural, and beliefs about cervical cancer screening, yet this information could be essential to the success of a culturally-based cervical cancer screening intervention program.

Purpose of the Study

Culture, religion, health beliefs, knowledge, and attitude have been found to have influence on an individual's health seeking behavior (Ackerson, K., 2012; Ali-Rises et al., 2014; Bandera, A.1977; Binka et al., 2016; Grissinger, 2007; Schiavo, 2007). The principal aim of this study was to obtain information about how knowledge, attitude,

culture, and religious beliefs affected the intention to seek Pap test screening among inner-city adolescent girls in Accra, Ghana.

Research Questions and Hypotheses

The following research questions and hypotheses were derived concerning Pap test screening status among adolescent girls in Accra, Ghana:

Research Question 1: What do adolescent girls in Accra, Ghana know about Pap test screening?

Null Hypothesis 1*:* Adolescent girls in Accra, Ghana have knowledge about Pap test screening.

Alternate Hypothesis 1: Adolescent girls in Accra, Ghana have no knowledge about Pap test screening

Research Question 2: Does knowledge about cervical cancer affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 2: Knowledge about cervical cancer does affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 2: Knowledge about cervical does not affect intent to Pap test screening among adolescent girls in Accra, Ghana.

Research Question 3: Do attitudes affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 3: Attitudes do not affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 3: Attitudes do affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Research Question 4: Does culture affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 4: Culture does affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 4: Culture does not affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Research Question 5: Do Religious beliefs affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 5: Religious beliefs do not affect to intent Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 5: Religious beliefs do affect intent to Pap test screening among adolescent girls in Accra, Ghana.

Nature of the Study

Quantitative methodology was used in conducting this study. There were several reasons for using quantitative methods. Data collections using quantitative methods can be relatively quick, and analysis is relatively less time consuming. In this study, I aimed to determine how knowledge, culture, attitude, and religious beliefs affected Pap test screening status among adolescent girls in Accra, Ghana. A quantitative method allowed me to construct situations that eliminated confounding variables that might have influenced the study results and allowed credibly creating cause and affecting the

relationship among variables. A quantitative study is also helpful using a large number of study samples and may have higher credibility when study sample size is large. There were items in the questionnaire that might have seemed uncomfortable for the adolescent girls to answer, such as number of sexual partners, what to do in case of vaginal bleeding between periods, and Pap test screening. In view of that, a semistructured questionnaire was used to collect data. Statistical Package for Social Science (SPSS) Version 24.0 was used for statistical analyses of this study. The aim of the study was to gain insight into how knowledge, culture, attitude, and religious beliefs affect Ghanaian adolescent girls regarding cervical cancer preventions. The confidential questionnaire was used so that the adolescent girls could feel free to express their opinions.

Theoretical Framework

The health belief model (HBM) was used as the theoretical approach for this study. The fundamental concept of the HBM is that health seeking behavior is determined by personal beliefs or perceptions about a disease and the ways used to prevent or decrease its occurrence (Bandura, 1977; Hochbaum, 1958) and treatment. Bandura (1977) and Hochbaum (1958) wrote that the HBM is a psychological health behavior change model to explain and predict health-related behaviors about how people seek health services. The HBM was originally developed by social psychologists (Hochbaum, 1958; Rosenstock, Strecher & Becker, 958) in the U.S. Public Health Services to gain insights into the extensive increase of people who failed to participate in intervention programs to prevent and detect tuberculosis. The HBM has been widely used in intervention programs to predict different health-related behaviors, such as being

screened for the early detection of asymptomatic diseases like cervical cancer. Other constructs were later added to the model to study people's health-seeking behaviors, responses to symptoms, and their behaviors, such as sexual risk behaviors (Bandura, 1977; Becker, 1974; Becker & Rosenstock, 1984; Rosenstock, Strecher & Becker, 1994). The main aim of HBM is to explain preventive health behaviors, and it focuses on health behaviors about prevention exposures of diseases at their asymptomatic stage where they are easily preventable or treatable.

The HBM contains many primary concepts that predict why individuals will take certain preventive actions, such as cervical or breast cancer screening or to manage disease conditions. The model predicts that health behaviors are influenced by several factors, namely perceived susceptibility, perceived seriousness, perceived barriers, perceived benefits, and cues to actions, perceived self-efficacy, and modifying factors (Bandura, 1977; Becker, 1974; Becker & Rosenstock, 1984; Rosenstock, Strecher & Becker, 1994). The theoretical constructs of the HBM regarding cervical cancer screening or cervical cancer prevention are presented in the literature review portion in Chapter 2.

Definitions of Terms

A*cceptability:* Interventions that seek to change social norms (Blankenship, Bray, & Merson, 2000) to make screening services obtainable.

Adolescent and young adult: Adolescent is used to describe the transition stage between ages 10 to 19 years and young adults are ages 20 to 24 years (U.S. Census Bureau, 2008).

Belief: The state of believing; conviction, or acceptance that certain things are true or real. Belief also implies acceptance of something as true even though absolute certainty may be absent

Cervical cancer: Cancer that starts in the cervix. C*ervix*: The lower part of the uterus or womb that opens the top of the vagina or enters the vagina also known as birth canal.

Culture: The manners, interests, and the way of thinking as well as talking; the ideas, customs, and arts of people that are transferred, communicated, or passed along from generation to generation. It is also the values, beliefs, and practices of one's identified ethnic, racial, or religious group (Dodd et al., 2001).

Faith: Implies complete, unquestioning acceptance of something. For example, religious faith; anything believed or accepted as true, such as a doctrine, or ideology.

Human papillomavirus (HPV): An STD and known as a risk factor for cervical cancer (Bosch, Lorincz, Munoz, Meijer, & Shah, 2002).

Papanicolaou test (Pap test) *or Pap smear:* A microscopic examination of cells scraped from the opening of the cervix. The aim of screening for cervical cancer is to find cervix cell changes and early cervical cancers before showing clinical symptoms. Screening can also find abnormal cervix cell changes (precancers) so that they can be treated before turning into cervical cancer.

Polygamy: Marriage in which a spouse of either sex may have more than one mate at the same time.

Religion: A series of spiritual practices and behavior within an organized religion structure (for example, the Methodist, Islam, or Catholic), which may inspire specific health behaviors (Shiavo, 2007).

Screening: Refers to the use of tests and exams to find a disease such as cervical cancer in women who may or may not have any clinical symptoms.

Society: (a) a group of people who are regarded to form a single community such as different social class; (b) a system of living together as a community in such a group; (c) A group of people who are regarded to represent a community, or interdependent individuals joined together due to shared goals.

HBM variables that are related to the model of this study are as follows:

Barrier: Something material that blocks or is intended to block a passage, a structure that prevents movement or action.

Cues to action: Evidence or reminder to take action, such as seeing someone die from an illness, clinical symptoms, advertisement, and personal communications with family members, religious leaders, health professionals, and peers.

Modifying factors or socioeconomic factors: Culture, ethnicity, religious belief, race, age, income status, and level of education. An exhaustive review based on these beliefs and variables is presented in Chapter 2.

Perceived barriers: Anything that is anticipated to prevent one from carrying out a recommended health action like different language, cultural issues, religious belief, cost, time, and lack of accessibility.

Perceived benefit: An individual's belief of the value or effectiveness of a new behavior to prevent or decrease risk of developing a disease, or the personal understanding of positive benefits to be gained for taking a health action to counteract a perceived threat.

Perceived risk or susceptibility: An individual assessment of one's chances of getting the disease. The assessment may include personal behaviors and family history (Chen & Kaphingst, 2010) and expects participation, for example, in cervical cancer preventions programs (Katapodi, Lee, Facione & Dodd, 2004).

Perceived severity or seriousness: An individual's judgment as to the severity of the disease (Weinstein & Klein, 1995), including both medical/clinical consequences and possible social-cultural consequences.

Perceived threat: The combination of perceived susceptibility and perceived severity (Stretcher & Rosenstock, 1997).

Self-efficacy: The confidence of taking specific action, for example, a belief in one's own ability to perform a given task or make certain behavioral change (Bandura, 1977).

Assumptions

Knowledge, culture, attitude, religion, and beliefs are known to limit women's participation in Pap test screening programs (Ackerson, 2012; Ali-Risasi, Mulumba, Verdonck, Broeck, & Praet, 2014; Ibekwe, Hoque, Ntuli-Ncobo, & Hoque, 2011). Ghana is a polygamous and multicultural society with different religious beliefs that can have an effect on HPV infections, cervical cancer preventions, and treatments. I assumed that

knowledge, culture, attitude, and religious beliefs affected the intent to Pap test screening status among adolescent girls in Ghana. Cervical cancer is widely associated with sexual activities, and premarital sex among adolescents is shunned in Ghana and may have presented as a barrier to Pap test screening for adolescent girls. I also assumed that participants would openly and honestly provide answers to questions presented because it was a confidential self-administering questionnaire. I assumed that participants did not intend to seek Pap test screening because of social stigma or the perception that they were sexually active. However, I assumed that participants would seek cervical cancer screening in the future if effective, affordable, and national screening programs were implemented and community members were adequately educated about the health and social and economic benefits of the Pap test.

Scope

A confidential survey questionnaire in the English language was used in the study. English is the official language used in Ghanaian schools even though other local dialects are also used in high schools in Ghana. In this study, I explored how knowledge, culture, attitude, and religious beliefs affect intention to cervical cancer screening among adolescent girls in Accra, Ghana.

Delimitations

The objective of this study was to explore the effects of knowledge, culture, attitude, and religious beliefs on cervical cancer screening among adolescent girls in Accra, Ghana. Due to financial and time constraints, study participants were selected from only adolescent girls in already visited high school in Accra, Ghana and did not

include other adolescent girls. The HBM was used for the study and a quantitative methodology with confidential self-administered questionnaire was used to collect data.

Limitations

As with many studies, this study has several limitations. The limitations include the following: (a) The study was conducted in the Accra metropolitan area in Ghana; therefore, the findings may not be generalizable to the entire high school female adolescent students in Ghana, (b) although the targeted population included female adolescents studying in high schools in the Accra metropolitan areas, the participants were drawn from one private high school, which is generally considered as middle to upper socioeconomic status in the Ghanaian culture, and (c) students from such socioeconomic status may be able to afford to pay for Pap test screening, which could have resulted in a high percentage rate of responses concerning their willingness to pay for a Papa test screening; therefore, the study results may not be representative of the population of adolescents girls in Ghana who attend public high schools.

A similar study in Brazil by Suares de Lima et al. (2013) among adolescent female students where the participants were drawn from different public schools showed that the HPV vaccination is considered the most effective way to prevent HPV infection besides abstinence; however, there was no question included in the questionnaire in this study regarding knowledge about HPV. Additionally, there were items in the questionnaire that elicited self-report information on sensitive issues, such as number of sexual partners, knowledge about diseases of the female genital tract, what to do in case of vaginal bleeding between periods, and Pap test screening. The potential existed that

participants' responses were biased to provide culturally or socially desirable responses. Furthermore, knowing that HPV is transmitted through sexual intercourse can have social stigma and can cause embarrassment and emotional burden in Ghana, which can be barriers for Pap test screening. These factors could have also prevented participants from providing honest information needed for this study.

However, in order to obtain as honest of information as possible, participation was voluntary, and information provided was confidential with the belief to prevent bias responses from the participants. Moreover, participants were reminded of the confidentiality of their responses and that no one would be able to identify them by their responses. Although a questionnaire can be used in a quantitative method, the closed questions may not have provided opportunities for the participants to provide adequate information about their desires, perceptions for, and barriers to Pap test screening. Responses to some of the open-ended questions were not in the answer key (the expected answers). These responses, however, were important and could be included in future studies. For example, for questions regarding Pap test and cervical cancer knowledge, Question 7 asked how cervical cancer can be prevented. Some of responses were that prevention of sexual intercourse could prevent cervical cancer. Another respondent also stated that she heard about cervical cancer through the Internet, but the Internet was not among the expected answers.

In addition, the study was conducted between June and July, and around that time, some of the high school seniors had finished writing their government mandated certification examinations as a requirement for graduation, so they were not available to

take part in the study. This might have led to the low number of participants aged between 18 to 20 years. It was in this age group that participants had a child each and had Pap test screening within the last 2 years. Prior to the start of this study, the literature review showed no data among the study population. I did not conduct a pilot study and relied on studies with similar sociodemographic information. Regardless of the limitations listed above, this study serves as a first step to systematically investigate and document how knowledge, attitude, and practice as well as culture and religious beliefs affect Pap test screening among adolescent girls in Ghana.

Significance of the Study

This study adds to an existing body of literature that addresses cervical cancer screening status among adolescent girls, especially in less developed countries where new cases and death rates of cervical cancer are common in women. In this age where sexuality has become common practice among adolescents, little is known about how interpersonal characteristics such as knowledge, culture, attitude, and beliefs affect the prevention of HPV infections and cervical cancer prevention among adolescents. The results of this study establish the need for research-based communication interventions that take into account knowledge, culture, attitude, behaviors, religious beliefs, and characteristics of the participants. The results of this study can also be used to address the needs of adolescents who are not engaging in sexual intercourse as well as adolescents who are currently sexually active but have no intention of going for a Pap test in the future, while ensuring that all adolescents are provided with effective education to protect themselves and others from HPV infections. A recent study in Ghana among university

students found that 30.5% of the participants had no intention of getting screened for cervical cancer in future (Binka et al., 2016).

In order for interventions to be effective, it is essential to understand adolescents' sexual behavior and barriers that prevent them from seeking healthcare services. Programs can be tailored to promote healthy sexual relationships, assure access to wide-ranging sexual and reproductive health services, and provide accurate and current public health information and resources while adolescents' privacies are protected. Patient confidentiality was found to be important component in adolescent reproductive health care (Reddy, Fleming, & Swain, 2002). Parental involvement may present as barriers for adolescents in seeking healthcare services. Being able to understand behaviors that lead to HPV infections is important to identify individuals within a population who are at higher risk for cervical cancer (Domfeh et al., 2008). The implications for positive social change from this research are that cervical cancer intervention education programs could be developed locally with the active involvement of all stakeholders in the community. The intent is to inform the community and bring about change. These include community education with the involvement of parents or guardians, teachers, traditional and religious leaders, policy makers, and healthcare professionals in order to be consistent with the sociocultural values in Ghana.

Summary and Transition

Cervical cancer is one of the most common cancers that affect a woman's reproductive organs. Various strains of HPV, a sexually transmitted infection, have been identified with playing a role in causing most cases of cervical cancer. In Ghana, cervical

cancer is the most common cancer and the leading cause of cancer mortality for women between the ages of 15 and 44 years (National Institutes of Health [NIH], 2003; WHO, 2010 a & b). Currently, little is known about female Ghanaian adolescents' knowledge, attitude, cultural, and beliefs about cervical cancer screening, yet this information is essential to the success of cervical cancer screening intervention or programs. The HPV screening status has been looked at in terms of lack of infrastructure, accessibility, cost, knowledge, cultural, attitude, religion, and beliefs. These factors were found to be determinants of HPV screening. Recommendations by healthcare professionals were also found to be effective in increased cervical cancer screening among women globally (Chavez, McMullin, Mishra, & Hubbell, 2001; Chavez et al., 1995; McCaffery et al., 2003; Rosario, 2010; Soares de Lima et al., 2014; Shaikh & Hatcher, 2004). Working to reduce anxiety of women concerning embarrassment and painful testing by healthcare professionals could increase screening. In addition, given that barriers prove to be important determinants of screening, they could be explored further using qualitative research. This would enable researchers to corroborate the findings of the current study and work towards planning successful interventions (Leyva, Byrd, & Tarwater, 2006). Future interventions must address the barriers that prevent HPV screening status among adolescents in developing countries like Ghana, where little is known about Pap testing. This chapter is followed by a detailed review of the related literature in Chapter 2. The theoretical framework, which guided an understanding of knowledge, perceptions, cultural, and beliefs about cervical cancer screening, is discussed in detail in Chapter 2. Chapter 3 follows with a description of the study design; participants, procedures,

assessments used; and information on data collection, management, and analyses. I present the study results in chapter 4, discussion, conclusion, and recommendations in chapter 5 respectively.

Chapter 2: Literature Review

Introduction

The purpose of this study was to quantitatively examine whether inner-city adolescent girls in Accra, Ghana had intentions to seek Pap test screening or not. I sought to determine how knowledge, culture, attitude, and religious belief affect intent to seek Pap test screening in the future among adolescent girls in Ghana.

The lifestyle of adolescents often consists of frequent risk-taking behaviors. These behaviors can involve unprotected sexual activities, which can lead to HPV infections and cervical cancer. Many studies have been conducted documenting the effects of knowledge, culture, attitude, and belief on cervical cancer preventions, diagnoses, and treatments. However, to date, little attention has been dedicated to understanding the cervical cancer screening status among adolescents in countries where cultural values, knowledge, attitude, and beliefs affect health seeking practices.

To begin, a comprehensive review of some examples of different religious, ethnic, cultural, age, and gender-related influences on the concepts of health and illness was conducted. Research strategies are presented to assist in locating articles for references. The remaining contents of this literature review address the determining effects on cervical cancer causes and prevention. This provides a better understanding of how knowledge, culture, attitude, and beliefs can influence adolescent girls regarding cervical cancer prevention. This review also helps shed light on how cervical cancer prevention programs can be tailored to adolescent girls, especially those living in countries where different ethnicity, cultural, and religious values are practiced. Many efforts have been

made about preventions and treatments of HIV/AIDS, but little effort has been made about the prevention and treatment of HPV, especially among adolescents. It is hoped that adequate resources will be provided for cervical cancer prevention among adolescents as well because both HIV/AIDS and HPV can be transmitted through sexual intercourse and can have tremendous burden on individuals and public health. Although several studies have been published about Pap test screening or cervical cancer preventions, I conclude this chapter with an explanation of how past research influenced this study. The influence of social context and position about healthcare-seeking and utilization behavior are documented in this chapter.

Literature Search Strategy

Literature research was conducted using several sources of information. Reviews were accessed using the general search terms like *cervical cancer screening status*, *belief about cervical cancer screening*, and *cultural practices and cervical cancer screening* as the root of all inquiries. With these terms, other search phrases such as *knowledge about cervical cancer screening*, *attitude and religious belief about cervical cancer*, *risk factors*, *prevalence,* and *incidence of HPV infections among persons aged 13-19* were used to narrow the search. The search was limited to most articles published within the last 5 years (from 2013 to 2018). However, some of the literature published before this timeframe was found to have provided important information to this study and was also included. Search engines used included Pub med, BioMed Central, Medline, and Google scholar. The Walden online library provided many of the needed articles for this review. The CDC also provided articles that led to the original authors. Additionally, Rutgers

University School of Health Sciences (Formerly, University of Medicine and Dentistry of New Jersey) Library provided additional resources to locate articles not found online. Book reviews also provided information for the research. In order to obtain general knowledge about Ghana, literature research was also conducted about its background, geographical location, people and languages spoken, ethnicity, religious affiliations, and educational systems. Others were family structure and sexual activities among adolescents and the healthcare systems. There was no literature found that directly referred to knowledge, culture, attitude, and belief as the main causes of or lack of cervical cancer screening among adolescent girls in Ghana. Therefore, in this literature review, I established the need for continued research concerning factors leading to Pap test screening among women and especially among adolescent girls in Ghana. The findings of this study can add to the literature, which can inform policy, practice, and research.

Literature Review

The vulnerability to STDs among adolescents and young adults is well documented (CDC, 2011, 2013; Workowski &Berman, 2010). The adolescent age can be important for intervention programs, which can lead to prevention of many chronic and infectious diseases such as diabetes, cardiovascular disease, stroke, AIDS, and cervical cancer. Studies have shown that there are different reasons why adolescents will not seek gynecological services even if they are sexually active (DiClemente et al., 2001; Reddy, Fleming, & Swain, 2002; Wight, Williamson, & Henderson, 2006). In their study about adolescent's confidentiality and health services, Reddy et al. (2002) reported that

adolescents were very much concerned about their confidentialities. The survey asked girls, under 18 years of age, if they would continue to seek medical care for prescribed contraceptives and testing/treatment for HIV and STDs if parental notification was mandatory (Reddy et al., 2002). The results indicated that 59% of the adolescent girls said they would stop using all sexual healthcare services, delay testing or treatment for HIV or other STDs, or discontinue use of specific (but not all) sexual health care services if their parents were informed that they were seeking prescribed contraceptives (Reddy et Al., 2002). Wight et al. (2006) write that being able to feel comfortable to talk with parents about sexual activities seems to bear little relationship to sexual behavior among adolescents (Wight et al., 2006)

Theoretical Framework

The theoretical framework of this study was derived from the HBM. The HBM is the most commonly used theory in health education and promotions (Glanz, Rimer & Lewis, 2002; NCI, 2003). A review of the HBM variables provided insight into how adolescent girls sought Pap test services in Ghana. Rationalization of this theory was the belief that health seeking individuals were influenced by different individual factors, for example individual factors such as knowledge, attitudes, gender, sex, culture, ethnicity, income, education, and the community where one lived. In addition to health service barriers, including accessibility and acceptability of care, cost of services, denial or fear, and quality of care can at times delay or prevent a person from seeking cervical cancer care and treatment. Stigmatization is also found to be a reason for delay or failure to seek preventive health services or treatments (CDC, 2012). Hochbaum (1958) wrote that the

fundamental concept of the original HBM was that health behavior is determined by personal beliefs or perceptions about a disease and the strategies available to decrease its occurrence (Hochbaum, 1958). Other constructs of HBM, such as cues to action, motivational factors, and self-efficacy can also influence individual health-seeking behaviors (Bandura, 1977; Becker, 1974; Becker & Rosenstock, 1984; Rosenstock et al., 1994). The HBM is explained in detail later in this chapter with regards to its effects on cervical cancer screening and how it could affect cervical cancer screening among female adolescents in Ghana. This theory has been used by many researchers in similar studies concerning Pap test screening (Bessler et al., 2007; Chen & Kaphingst, 2010; Gerend & Magloire, 2008; Were et al., 2011) and are presented in detail later in this chapter.

Effectiveness of the Pap Test for the Detection of Cervical Cancer

Available data indicate that the Pap test is effective in identifying HPV infection and is credited with the decline of cervical cancer morbidity and mortalities in developed countries (Castellsague, 2008; CDC, 2011 b; Ferlay et al., 2018; WHO, 2018; Yank, Bray, Parkin, Sellors &Zhang, 2004). The incidence of cancer and deaths from cervical cancer has declined over the years because of prevention, screening, and early detection by Pap tests (CDC, 2010; WHO, 2018). Cervical cancer used to be the leading cause of cancer death for women in the United States. However, in the past 40 years, the number of cases of cervical cancer and the number of deaths from cervical cancer have decreased significantly (ACS, 2018). This decline is largely the result of women who do regular screening to detect precancerous before it turns into cancer (ACS, 2018; NCI, 2002; NIH, 1996).

McCaffery et al. (2003) wrote that despite the perceived stigmatizations of HPV testing among certain ethnic women from the White British and African-Caribbean groups, participants expressed positive views about testing and welcomed the added protection that HPV testing provides for cervical cancer prevention. Women from all groups reported a lack of information about HPV and underscored the need that HPV testing would be effective to provide health information about the virus, its transmission, latency, prevention, and association with cervical cancer. McCaffery et al. (2003) reported that such information, while being difficult to communicate, may be important to manage potential negative impact of HPV.

Early Diagnosis and Screening

Cancer mortality can be reduced if cases are detected and treated in their early stages. Cervical cancer is known to be preventable when detected in the early stage (Likes & Itano, 2003; WHO, 2018). The awareness of early signs and symptoms can facilitate diagnosis and treatment before the disease becomes advanced. Early diagnosis programs are particularly important in less developed countries where the majority of patients are diagnosed in very late stages (WHO, 2011). Screening programs are especially effective for regular screening, which is cost-effective, affordable, acceptable, and accessible to the majority of the population at risk (WHO, 2011, 2018; Ronco et al., 2010). Education to promote early diagnosis and screening and recognizing possible warning signs of cancer and taking timely action leads to early diagnosis. Increased awareness of possible warning signs of cancer among healthcare providers as well as the general public can have a great impact on the disease. Some early signs of cancer include

lumps, sores that fail to heal, and abdominal bleeding (WHO, 2011). Analyses of cervical cancer incidence by stage at diagnosis contribute to the assessment of the impact of screening programs (Schiffman et al., 2011; Schiffman & Castle, 2003; Schiffman, Brinton, Devessa, Fraumeni, & Joseph, 1996). Cervical cancer screening identifies precancerous lesions and prompts early treatment to prevent advanced-stage cancer and death (Schiffman & Hildeshmein, 2011; Schiffman et al., 2005; 1996; WHO, 2018).

Observed differences in incidence and mortality rates of cervical cancer among various minority groups are largely attributed to disparities in screening, follow-up, and treatment. Nonadherence to screening and follow-up may lead to later stages of diagnosis, which in turn can result in increased morbidity and mortality rates (CDC, 2011; WHO, 2010). Approximately 50 million women undergo Pap test screening, and about 5 million of these Pap tests will require additional follow-ups each year (Cox, 2005; Saslow et al., 2002; Wright Jr., Cox, Massad, Twiggs, & Wilkinson, 2002). Cervical cancer incidence rates have decreased approximately 75% and death rates approximately 70% since the 1950s, largely because of the introduction of Pap testing (Saslow et al., 2002). Routine Pap test has many benefits to individuals and society by identifying HPV infection and treating it at its curable stages (CDC, 2011). In the United States, public health prevention of cervical cancer includes both secondary prevention through cervical cancer screening and primary prevention through HPV vaccination (ACS, 2018; CDC, 2012; National Comprehensive Cancer Network [CCN], 2010). More than 50% of women who develop cervical cancer in the United States and more than 95% worldwide are either unscreened or inadequately screened (Rosario, 2010). Despite the

remarkable progress made in reducing the incidence of cervical cancer in the developed countries, it remains a problem for public health. Most of these deaths also occur in Sub-Saharan Africa due to nonscreening because of lack of accessibility to cervical cancer screening programs (Dailard, 2003; WHO, 2010 a & b; WHO, 2013 a & b).

A recent analysis of data from the National Health Interview Survey (NHIS) in US found an overall cervical cancer screening rate of 83%, with lower rates among Asian, American Indian/Alaska Native, Hispanic, and foreign-born women (CDC, 2012). Higher rates of cervical cancer among black and Hispanic women may partly be due to reduced access to screening and or follow-up care (Benard, Lawson, Eheman, Anderson, & Helsel, 2005). Most women do not equally have access to cervical cancer screening and the incidence of cervical cancer is higher among ethnic minorities and poor women (Anhang, Goodman & Goldie, 2004).

Guidelines for Pap Test or Cervical Cancer Screening

Major organizations like American Cancer Society (ACS), and the U.S. Preventive Services Task Force (USPSTF), American College of Obstetricians and Gynecologists (ACOG), American Society for Clinical Pathology (ASCP) guidelines recommend that all women begin cervical cancer screening about 3 years after beginning having vaginal intercourse, but no later than 21 years old. Screening should be done every year with the regular Pap test or every 2 years using liquid-based Pap test but women with a history of risk behavior may need to have a different screening schedule for cervical cancer. A recent review found new guidelines now commending first screening at age 21 and women ages 21 through 29 years be screened with a Pap test

every 3 years. Women ages 30 through 65 can be screened every 5 years with a Pap and HPV test or every 3 years with Pap test alone (ACS,2018 b; ACOG,2016; ACOG, 2017; USPSTF, 2018; 2008).

Epidemiology of Cervical Cancer and HPV Infections

Cervical cancer is one of the most common causes of cancer-related disease and death among women worldwide (WHO, 2018). It is the fourth cancer incidence after breast cancer, colorectal and lung cancer and fourth in mortality worldwide (Bray et al., 2018) and the second most common cancer in women in developed countries (WHO, 2018). Cervical cancer deaths have declined in developed countries including the US but in Sub-Saharan Africa where Ghana is located; there is continuous burden of cervical morbidity and mortalities (WHO, 2018). The World Health Organization estimates cervical cancer incidence of West Africa to be 19.9% but Ghana alone has a cervical cancer rate of 26.4% (WHO, 2010a). In addition, while cervical cancer ranks as fourth cancer among women globally and in Africa, it is the highest cancer incidence among all women and among women aged 15 to 44years in Ghana (WHO, 2010a). In Ghana, it is the most incident cancer and the leading cause of cancer mortality among women including adolescent (Abotchie & Shokar, 2009; WHO, 2010a). Globally, the burden of cervical cancer incidence and death is highest in the developing countries. India has the highest proportion of cases and deaths of any one country and sub-Saharan Africa has the highest incidence of cervical cancer of any region (WHO, 2007). Lack of cervical cancer screening has been found to be the cause of cervical cancer disparities. For example, in the US, African Americans continue to suffer the greatest burden for each of the most

common types of cancer (ACS, 2018). Complex factors contribute to the observed disparities in cancer incidence and mortalities among racial, ethnic, and underserved groups. The most apparent factors are associated with a lack of healthcare coverage, access to health infrastructure, and low socioeconomic status (ACS, 2018; NCI, 2010; Sanghvi et al., 2008). Several studies have shown that Sub-Saharan Africa and South America have the highest incidence of cervical cancer in the world and ranks as one of the top five causes of cancer death in the United States Affiliated Pacific Islands and is the leading cancer killer among all women in Ghana (Kawamoto, 2009; Rosario, 2010; WHO, 2010 a). This poses a particular concern since aggressive illnesses, such as cancers may go undetected until they become life threatening (Kawamoto, 2009; Rosario, 2010).

Magnitude of the Problem

Current estimates indicate that every year 570,000 women are diagnosed with cervical cancer and 311,000 die from the disease globally (Bray et al., 2018; WHO, 2018). It is identified as the second leading cancer among women ages 15-44 years (WHO, 2007). Africa has a population of 274.49 million women ages 15 years and older who are at risk of developing cervical cancer. Cervical cancer ranks as the top cancer in women in Africa and of women between 15 and 44 years of age it ranks second (WHO, 2010 a). It is estimated that 80,419 women are diagnosed each year with cervical cancer while 53,334 die from the disease in Africa (WHO, 2010 a). About 21.3% of women in the general population are estimated to have cervical HPV infection at a given time, and about 70% of invasive cervical cancers are attributed to HPVs 16 or 18 (WHO, 2010 a). In Ghana, it is estimated 3038 women are diagnosed yearly with cervical cancer and

more than 2000 die from the disease (WHO, 2010 a) and leading cause of death in females among breast cancer (Chireh, 2011). The annual new cases of cervical cancer in Ghana is estimated to be 5,007 and cervical cancer deaths to be 3, 038 by 2025 respectively (WHO, 2010 a & b).

Incidence

HPV infection occurs throughout the world. Viruses in the Papillomavirus family affect other species such as rabbits and cows. However, humans are the only natural reservoir of HPV. There is also no known seasonal variation in HPV infection (CDC, 2011). Approximately 12,000 women are diagnosed with cervical cancer and over 4,000 women die from cervical cancer each year (ACS, 2007; CDC, 2012; CDC, 2018 a). From 2003 through 2007, cervical cancer incidence in the United States was 8.1 per 100,000 women (NIH, 2010a). Approximately 243,884 women had a history of cancer of the cervix with median age of 48 years in 2008 and about 1.5 times higher than that for white women (CDC, 2018a). Incidence for Hispanic women also was higher than that for white women (Saraiva, et al., 2007). Death rates for black women were twice that for white women. Although incidence for Asian women overall is similar to that for white women (Saraiya, et al., 2007), certain Asian subgroups, especially Vietnamese and Korean women, have higher rates of cervical cancer (Miller et al., 1996).

Transmission

HPV is transmitted through genital contact, most often during vaginal and anal sex or genital-to-genital contact (WHO, 2018). HPV transmission can also occur through nonpenetrative sexual activity such as during oral sex as well as contact with someone or

becomes exposed to the infected person or object (CDC, 2013). HPV can be passed on between straight and same-sex partners even when the infected partner has no signs or symptoms. HPV infection can be detected even if years after sexual contact with an infected person (CDC, 2011). Genital HPV infection also may be transmitted by nonsexual routes such as transmission from a woman to a newborn infant at the time of birth (CDC, 2011). This leads to the development of juvenile-onset recurrent respiratory Papillomatosis (JORRP) (CDC, 2011). An infected individual develops warts in their throat, and this causes asphyxia (a condition of severely deficient supply of oxygen to the body that arises from being unable to breathe normally) and could be a life-threatening condition (CDC, 2010). Other researchers assert that cesarean delivery decreases the risk of acquiring JORRP (Shah et al., 1986). However, CDC does not recommend cesarean delivery for women with genital warts just to prevent JORRP because it is not clear that cesarean delivery prevents JORRP in infants and children (http://www.cdc.gov/hpv/prevention.html). Recurrent respiratory Papillomatosis is a rare disease that is characterized by the growth of tumors in the respiratory tract caused by HPV (CDC, 2011). Studies of newly acquired HPV infections demonstrate that infection occurs soon after onset of sexual activity. A recent prospective study of college women about HPV infections showed a cumulative incidence of 40% within 2 years after first sexual intercourse and HPV 16 accounted for 10.4% of infections (CDC, 2011).

Risk Factors of HPV Transmission and Cervical Cancer

Predisposing or risk factors for HPV infection are related to sexual behaviors which include lifetime history of sex partners, having multiple sexual partners, and sexual

intercourse at a young age (CDC, 2012). Epidemiologic studies report that early age of first sexual intercourse, HPV infection, immunosuppressant, alcoholism, smoking, and genetic factors are other risk factors associated with cervical cancer (CDC, 2004; CDC, 2012; Looker et al., 2018; Munoz, et al., 2003; WHO, 2018). Lack of screening and inadequate treatment of pre-cancerous lesions are also some of the risk factors for HPV infections, as well as not using condom during sexual intercourse, inconsistent condom use, number of pregnancies, and lack of circumcision of male partner (CDC, 2011; McLntyre-Seltman, Castle,Guido, Schiffman, Wheeler, 2005; Schiffman, Brinton, Devessa, Fraumeni & Joseph, 1996). Other researchers estimate that more than 80% of sexually active women will have acquired genital HPV by age 50 years (Myers, McCrory, Nanda, Bastian, & Matchar, 2000).

Several studies about HPV prevalence and incidence show that consistent predictors of infection have been measures of sexual activity, number of sex partners including recent and lifetime (Looker, et al., 2018; Ho, Bieman, Beardsley, Chank, & Burk, 1998; Ho, et al., 1995; Moscicki, et al., 2006; Trottier & Franco, 2006). Unprotected vaginal intercourse or skin-to-skin contact, contraceptives use, weakened immune systems, increased age, and genetic factors are found to be important factors for HPV infections (Munoz, Castellsague, de Gonzalez, Gissmann, 2006; Zelmanowicz et al., 2005; WHO, 2007). It is also possible to transmit HPV through oral sex even though it is not as common as transmission through vaginal or oral sex. Transmission of HPV through oral sex happens when a person has the virus but shows no clinical symptoms

and engages in oral sex (CDC, 2010). The HPV can also be transmitted by a mother to a child through delivery.

According to the CDC, approximately 12, 000 women are diagnosed with cervical cancer each year in the United States of America. To assess the incidence of HPV associated cancers in the US, CDC analyzed 2004–2008 data from the National Program of Cancer Registries (NPCR) and the Surveillance, Epidemiology, and End Results (SEER) program. During 2004–2008, an average of 33,369 HPV-associated cancers were diagnosed annually (rate: 10.8 per 100,000 population), including 12,080 among males (8.1 per 100,000) and 21,290 among females (13.2). Cervical cancer was the most common cancers with an average of 11,967 cases annually. Rates of cervical and penile cancer were higher among blacks (9.9) and Hispanics (11.3), when compared with whites (7.4) and non-Hispanics (7.4) (CDC, 2012).

Having education about beliefs and personal behaviors associated with the acquisition of HPV infections is important to identify individuals in a population that are at higher risk for cervical cancer. In their study to estimate the HPV prevalence and its determinants among a sample of women in Ghana, Domfeh et al (2008) used dot blot to detect the presence of HPV DNA and the evidence of cervical HPV infection was reported in 33% and 48% of rural and urban women in Ghana, respectively. The crude HPV DNA prevalence was 10.7%. Compared with other studies, the authors reported that HPV prevalence was high among young women and middle and old age. Being educated was found to be independent HPV determinant prevalence odds ratio (POR) of 13.9% and having more than three lifetime sexual partners (POR) of 4.6%. According to the

authors, the study results may be a typical feature of polygamous populations where HPV transmission continues into middle age and cervical cancer incidence is very high (Domfeh et al., 2008).

In comparison with older adults, sexually active adolescents aged 15-19 years and young adults aged 20-24 years are at higher risk of acquiring STDs for a combination of behavioral, biological, and cultural reasons (Bankole, Biddlecom, Guilla, Singh, & Zulu, 2007; CDC, 2014). Condom use is known to protect against genital HPV infections (Winer et al. 2006) but condoms uses are not foolproof to protect HPV infection (CDC, 2010). HPV and HIV co-infection may also speed up progression of cervical cancer (WHO, 2010a). Tobacco smoking has also been reported as a risk factor for cervical cancer (WHO, 2018; Palma et al., 2010). In their study, Palma et al reported that smoking has a strong influence on local inflammation and immune response. Among HPV 16 infected women, *ever smokers* had a delayed antibody response when compared to *never smokers*. The authors asserted that tobacco smoking could increase the viral infection persistence of HPV and tumor onset of cervical cancer (Palma et al., 2010).

Prognosis

The prognosis for patients with cervical cancer is mostly affected by the extent of disease at the time of diagnosis. Studies show that early diagnosis of cervical cancer is curable. Infection with low-risk HPV types, such as types 6 and 11, can cause benign or low-grade cervical cell abnormalities, genital warts and laryngeal Papilloma. High-risk, or oncogenic, HPV types act as carcinogens and are known to be the cause of cervical cancer (CDC, 2011; Schiffman, Clifford, & Buonaguro, 2009; Stone et al., 2002).

Research shows that although HPV infection is usually asymptomatic, cervical infection can result in histological changes that are classified as cervical intraepithelial neoplasia (CIN) grades 1, 2, or 3 (or CIN1, CIN2 & CIN3) on the basis of increasing degree of abnormality in the cervical epithelium. Spontaneous clearance or progression to cancer due to lack of treatment varies for CIN 1 and CIN 2, and CIN 3. CIN 1 usually clears spontaneously (60% of cases) and rarely progresses to cancer (1%); a lower percentage of CIN 2 and 3 usually clears (30% to 40%), and most lead to progresses to cervical cancer if left untreated was more than 12% (McCredie et al., 2008; McLntyre-Seltman et al., 2005; Moscicki et al., 2010; Oster, 1993).

Prevalence Among Adolescents and Young Adults

Age is found to be one of the factors in defining health and healthy behaviors (Schiavo, 2007). Sexual risk-taking behaviors among adolescents are well documented (CDC, 2011; Hogewoning et al., 2003; Karim, Magnani, Morgan, & Bond, 2003; Kiragu, 1991; Lawrence, Gootman, & Sim, 2009; Lin, Whitlock, O'Connor, & Bawer, 2008; Martinez, Copen, & Abma, 2011; WHO, 2011). Ohene & Akoto (2008) write about factors associated with sexually transmitted diseases among young women in Ghana. In the US, the most STDs are among adolescents and young adults (CDC, 2011). A study by the CDC indicates that approximately half of the estimated 19 million STDs that occur in the United States each year are among people 25 years and younger (CDC, 2011). Many adolescents engage in sexual risk behaviors that can results in unintended health outcomes. For example, a 2013 survey among U.S. high school students showed that 46.8% had ever had sexual intercourse, 34.0% had had sexual intercourse during the

previous 3 months, and of those, 40.9% did not use a condom the last time they had sex. Also, 15.0% had had sex with four or more people during their life (CDC, 2014). Sexual risk behaviors place adolescents at risk for HIV, other STDs, and unintended pregnancies (CDC, 2014).

A prospective cohort study in Italy showed an overall prevalence of low-risk HPV among 16-19-year-old adolescent girls was about 80% while the overall prevalence of high-risk HPV was 85.5% among 20-25-year-old patients. The goal of the study was to describe the age-specific distribution of HPV genotypes and related disease among females under the age of 25 years. The univariate analysis showed statistical significance difference of HPV infection between the two groups of age ($P < 0.005$). According to the authors, cervical cancer screening program in Italy seemed to start later than the beginning of HPV-related pathology (Pieralli et al., 2011).

Although there are no data on HPV prevalence among adolescents and young adults, a study by WHO estimates age-specific prevalence among women less than 25 years in West Africa to be about 30% (WHO, 2010). Other studies about disparities in the prevalence of HPV infections among age groups have been published. In their study, Wiredu & Armah (2006) reported that the age-specific point prevalence of cervical HPV infection among the study group was notable. The researchers found a peak among women 41 to 50 years of age, followed by women in 21-30 year group, then women in 31-40 year group, and finally women in 11-21 and 51-60 year groups (Wiredu, & Armah, 2006). Similar studies in Ghana shows that cervical cancer is the most common cause of cancer mortality in women with 17.4% mortality rates in women and 7.1% among

adolescent and older women between 15 and 44 years (WHO, 2010a). A recent study shown in Figure 1 shows an alarming trend of HPV infections among adolescents and young adults in the US (CDC, 2011). Of these new cases, approximately 74 percent, or 4.6 million, occurred in the teenage to young adult ages 15 through 24 years. Prevalence was highest among adolescent girls between the ages of 14 through 19 years (CDC, 2011).

National Health and Nutrition Examination Survey (NHANES) used a representative sample of the USA non-institutionalized civilian population. The researchers interviewed females aged 14 to 59 years (see figure 1) at home for NHANES 2003-2004 (Dunne, et al, 2007), examined in a mobile examination center and provided a self-collected vaginal swab specimen. Overall HPV prevalence was 26.8% (95% confidence interval [CI], 23.3%-30.9%) among USA females aged 14 to 59 years (n = 1921). HPV prevalence was 24.5% among adolescent girls with 44.8% among women aged 20 to 24 years, 27.4% among women aged 25 to 29 years, 27.5% among women aged 30 to 39 years, 25.2% among women aged 40 to 49 years, and 19.6% among women aged 50 to 59 years. Dunne et al., (2007) reported that there was a statistically significant trend for increasing HPV prevalence with each year of age from 14 to 24 years ($p<.001$), followed by a gradual decline in prevalence through 59 years ($p = .06$). HPV vaccine types 6 and 11 (low-risk types) and 16 and 18 (high-risk types) were detected in 3.4% of female participants; HPV-6 was detected in 1.3%, HPV-11 in 0.1%, HPV-16 in 1.5%, and HPV-18 in 0.8% of female participants. Independent risk factors for HPV detection were age, marital status, and increasing numbers of lifetime and recent sex partners.

According to Dunne, et al., (2007), the burden of prevalent HPV infection among females was greater than previous estimates and was highest among those aged 20 to 24 years (Dunne, et al., 2007).

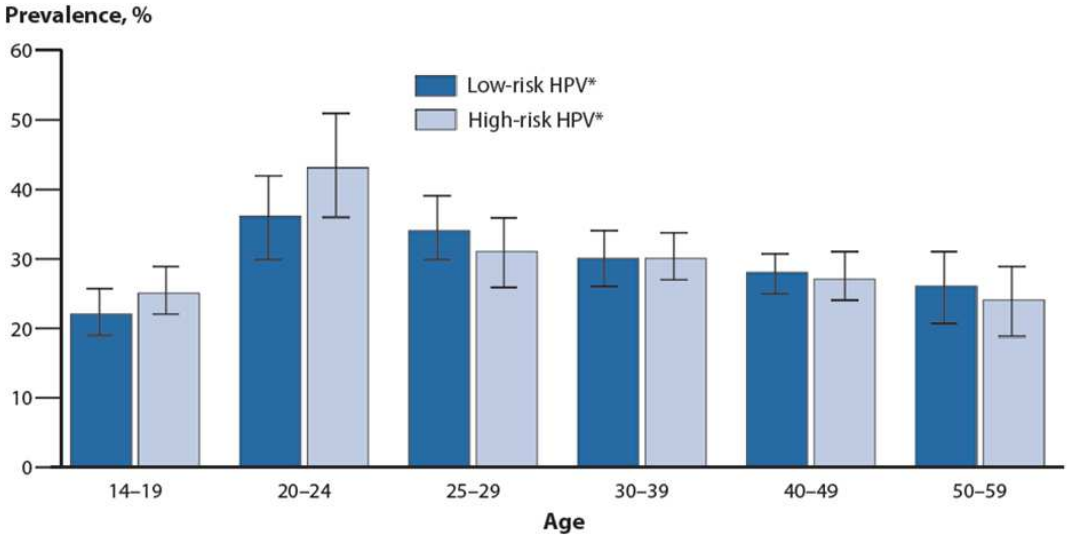

Figure 1. Note: Adopted from: *HPV prevalence of high-risk and low-risk types among females aged 14–59. National Health and Nutrition Examination Survey, 2003*–2006, (CDC, 2011). *Reproduced with permission. See Appendix C.*

In the USA, it is estimated that at least 50% of sexually active men and women acquire genital HPV infection at some point in their lives. A recent estimate suggests that 80% of women will have acquired genital HPV infection by age 50 and estimated 9.2 million sexually active youth 15-24 years of age are currently infected with genital HPV (CDC, 2012).

Prevalence Among People With Multiple Sexual Partners

Having multiple sexual partners have been reported to increase risk of HPV infections with prevalence of HPV infections increases with increasing numbers of sexual partners. The Society of Obstetricians and Gynecologists of Canada (SOGC) report showed a prevalence of cancer-causing types of HPV in different groups of females ranging from 11% to 25%. A clinical study of women who had more than one sexual partner showed that 46% had cervical HPV infection at three years after their first intercourse (SOGC, 2017). The study by Domfeh et al. (2008) found that the percentage of those married to one person at a time was 21.3% with a crude HPV DNA prevalence of 10.7% in Ghana. The study found that HPV prevalence was high among all women including adolescent girls. According to the authors, the study result had implications for the provision of formal education and for the design of adolescent-specific cervical cancer health educational programs in Ghana (Domfeh et al., 2008). As a polygamous society, this result could be high among those with multiple sexual partners. Lindau, et al. (2007) found that among women aged between 16-44 years, adolescent and young adults had more sexual partners and in multiple sexual relationships than older women. In another study of older women (57-85 years), sexual activity declined with age and those who reported being sexually active were more likely to be in a relationship (Lindau, et al., 2007). Manhart et al. (2006) also reported that women aged 18 to 25 years with one lifetime sex partner had 14.3% chance of HPV infections while two or more lifetime sex partners had 22.3% and 31.5% respectively had risk factors of HPV infections had HPV infection (Manhart, et al., 2006). Additional risk factors primarily identified for females

include partner sexual behaviors (Winer, et al., 2003; 2006). With a polygamous society like Ghana, adolescent girls or women could be at risk of STDs like HPV and others as a result of sexual behaviors of their partners.

Environmental Factors

Many diseases are caused by different factors such as behavioral, socioeconomic, political, environmental factors , access and use of health care services (Awusabo-Asare, Biddlecom, Kumi-Kyereme, & Peterson, 2006; Baidoo, 2009; Dodoo, 2004; Looker et al., 2018; Ghana Statistical Service, 2011; Ghana AIDS Commission, 2012; Gillan, 1991; Gwakins et al., 2007; Hiatt & Breen, 2008; Mosavel, 2011; Neequaye, Neequaye, & Biggar, 1991; NYPH, 2006; The Word Bank, 2017; Schieber, Cashin, Saleh, & Lavado, 2012; WHO, 2005b; WHO, 2011b; WHO, 2012; WHO, 2012 a & b). The community or society where people live can significantly affect individuals' health as well as public health. Research shows that health starts in individual homes, schools, workplaces, neighborhoods, and communities (Healthy People 2020; Public Health Agency of Canada, 2011). It is well known that not smoking, not using illicit drugs, not engaging in risky sexual behaviors, but getting the recommended vaccinations, routine screening tests, and seeing healthcare professionals in times of sickness significantly influence positive health outcomes. Individual's health is also determined in part by access to social and economic opportunities; resources and supports available in individual homes, neighborhoods, and communities. Other factors include lack of health care facilities and political will (Shaghvi et al., 2008); the quality of schooling; the safety of workplaces;

and the nature of social interactions and relationships (Healthy People 2020). Lack of these factors can affect adolescents' health and increase their risks of cervical cancer.

A study showed that 4 in 10 Ghanaian adolescent girls had sex and 83% have had sex by 20 years. Of this, about 25% had sex against their will while 12% were forced into their first sexual intercourse. (http://www.guttmacher.org/pubs/rib/rib1-04.pdf). Researchers have also used nationally representative surveys from 12–19 year old girls in Burkina Faso, Ghana, Malawi, and Uganda (Moore, Awusabo-Asare, Madise, John-Lagba, & Kumi-Kyeremi., 2007). The researchers examined the prevalence of sexual coercion at first sexual intercourse among unmarried girls. In Malawi, 38% of adolescent girls reported that they were "not willing at all" at their first sexual experience followed by 30% in Ghana, 23% in Uganda, and 15% in Burkina Faso respectively. Primary types of sexual coercion among same demographics were reported as forced sex; pressure through money or gifts; flattery, pestering, and threatening to have sex with other adolescent girls; and passive acceptance (Moore et al., 2007). Another study by the WHO (2010a) has shown environmental differences about HPV prevalence. For example, in Sub-Saharan Africa, HPV prevalence was estimated at 21.3%, with significant variations from region to region: 33.6% in East Africa, 21% in South Africa, and 21.5% in West Africa (WHO, 2010a). A study in Ghana also found that the crude HPV DNA prevalence was 10.7% among young women and other age groups as well compared with most populations studied in Sub-Saharan Africa. The study found that independent HPV determinants were illiteracy with prevalence odds ratio of 13.9% and reporting more than three lifetime sexual partners had a 4.6% (Domfeh et al., 2008). Ali-Risali et al. (2014)

also found that place of residence affected attitude of women regarding cervical cancer screening in Kinshasa, the Democratic Republic of Congo.

Epidemiology of Cervical Cancer in Ghana

Risk of Developing Cervical Cancer in Ghana

In Ghana, 6.57 million women over the age of 15 are currently at risk of developing cervical cancer (WHO, 2010a & b). Each year in Ghana about 3,038 women are diagnosed with cervical cancer and at least 2,000 women die from cervical cancer (WHO, 2010 a & b). Cervical cancer is the first most frequently diagnosed form of cancer in women in Ghana, including adolescents. It is estimated that by 2025, new cervical cancer cases would be 5,007 and cervical cancer deaths would be 3,361 respectively (WHO, 2010 a & b). Statistics show the prevalence of 21.5% of women in the general population to have cervical HPV infection at a given time in West Africa (WHO, 2010a). Demographic and geographic variables increase cervical cancer risks in Ghana. Cervical cancer screening is not common in Ghana and is limited to a few healthcare locations in the country and lack of comprehensive national screening program limits the number of women who receive screening (Adanu, 2002). Cervical cancer is preventable type of cancer but presently, only 3.2 % of urban women age 18 to 69 and 2.2% of rural women age 18 to 69 get screened for cervical cancer at least once every three years in Ghana (WHO, 2010 a). While the World Health Organization (WHO) estimates cervical cancer incidence in West Africa at 19.9%, Ghana alone has cervical cancer rate of 26.4% (WHO, 2010a). Cervical cancer screening rate in Ghana is low hence its high rate of cervical cancer incidence. The low rates of cervical cancer

screening have been the cause of no significant decrease in cervical cancer incidence in developing countries in the past three decades (Asante-Agyei, 2010). A study by Abotchie & Shokar (2009) showed that prior pap screening rate in Ghana was 12.0%; women were unaware of local screening initiatives and only 7.9% were aware of the link between HPV and cervical cancer. The most prevalent barriers were lack of awareness that pap screening can diagnose cervical cancer, concerns about perceptions of others and lack of information about how to obtain screening services. Although women perceived the benefits of screening, only about half perceived to be at risk. Barriers that prevented Ghanaian women to go for Pap test were lack of belief that Pap test diagnoses cervical cancer that Pap test was painful, and that Pap test would take away virginity (Abotchie & Shorkar, 2009). A recent cross-sectional study by Binka et al. (2016) to examine knowledge and perceptions of cervical cancer and screening behavior among female university students in Ghana showed that 53.4% (187) were aware of cervical cancer screening while 46. 6% (164) were not aware of screening for cervical cancer. Among the 187 participants who were aware of screening for cervical cancer, 92.0% indicated that they had not been screened in the last 2 years and only 8.0% had been screened in the last 2 years. Among the participants who had knowledge about screening for cervical cancer, 69.5% had intention of getting screened in future while 30.5% had no intention of getting screened for cervical cancer in future (Binka et al., 2016). In their study to ascertain the knowledge and practice about cervical cancer screening among women in Nigeria and factors hindering the use of available screening services, Nwankwo, Aniebue, Aguwa, Anarado, & Agunwah,(2011) , using a cross-sectional study with interviewer-

administered questionnaire reported that only 15.5% of the respondents were aware of availability of cervical cancer screening services. According to the authors, the awareness significantly varied with the level of educational attainment ($P < 0.0001$) and only 4.2% had ever done Pap smear and were all referred for screening. Lack of knowledge (49.8%) and less susceptibility to illness (32 %) were found to be the most important factors that hindered the use of available cervical cancer screening services. It was concluded that effective female education and free mass screening were necessary for any successful cervical cancer screening program (Nwankwo, et al., 2011). These findings show that effective preventive programs can help reduce incidence, prevalence and mortality rates of cervical cancer.

Incidence of Cervical Cancer in Ghana

Compared to other cancers in Ghana, cervical cancer ranks highest among all women (Abotchie & Shokar, 2009; WHO, 2010a). The World Health Organization (WHO) estimates the annual age-standardized cervical cancer incidence rate in Ghana as 29.3/100,000. Among gynecological cancers diagnosed at a large hospital in Ghana, cervical cancer accounted for about 60% of cases and 70% of these cases were diagnosed at an advanced stage (Adanu, 2002). The global mortality rates of cervical cancer are significantly lower than incidence with a ratio of mortality to incidence to 52% (WHO, 2010 a) current burden of invasive cervical cancer in Ghana and the Western Africa region with estimates of annual number of incidence and mortality rates. Cervical cancer is the fourth highest cancer incidence among women worldwide (Bray, et al., 2018; WHO, 2018). In Ghana, however, it is the highest cancer incidence among all women and

it is projected to be 5,007 annual new cases and deaths of 3,038 by 2025 (WHO, 2010a). Incidence of cervical cancer in Ghana, Western Africa and the World and crude incidence rates are 26.4; 19.9 ;15.8 respectively and 0-74 years 14.4; 3.8; 1.6 and annual number of new cancer cases 3038; 28903; 529409 respectively (WHO, 2010 a). The incidence rates of cervical cancer compared to other cancers in Ghana are presented in Tables 1 and 2.

Table 1

Incidence of Cervical Cancer Compared to Other Cancers Among Women of All Ages in Ghana

Cancer type	Mortality rate
Cervical	26.4%
Breast	17.9%
Liver	7.3%

Table 2

Age-Specific Cervical Cancer Incidence Compared to Age-Specific Incidence of Other Cancers Among Women 15-44 Years of Age in Ghana

Cancer type	Mortality rate
Cervical	16.51%
Breast	14.1%
Liver	3.3%

Note. Data Source: *Information Center on HPV and Cervical Cancer. HPV related Cancers in Ghana. Summary Report Update. WHO, 2010). Open Access data-See Appendix E*

Mortality of HPV Related Cancer in Ghana

Presently, cervical cancer is the fourth most common cause of cancer death among women worldwide after breast, colon, and lung cancers (WHO, 2013) but it is the leading cause of mortalities in all women in Ghana followed by breast cancer and liver cancer (Abotchie & Shokar, 2009; WHO, 2010a). Those affected include adolescents and those in their reproductive years from 15 to 44 years (WHO, 2010a). The mortality rate of cervical cancer in West Africa is 13.4% but Ghana has a mortality rate of 17.4% among all women and is the highest cancer death among women between 15 to 44 year (see tables 3&4) followed by 9.9% for breast cancer and 7.2% for liver cancer respectively (WHO, 2010a).

Table 3

Cervical Cancer Mortality Compared to Other Cancers in Women of All Ages in Ghana

Cancer type	Mortality rate
Cervical	17.4%
Breast	9.9%
Liver	7.2%

Table 4

Age-Specific Mortality Rates of Cervical Cancer Compared to Age-Specific Mortality Rates of Other Cancers Among Women 15-44 Years of Age in Ghana

Cancer type	Mortality rate
Cervical	7.1%
Breast	5.1%
Liver	1.9%

Note. Data Source: *Information Center on HPV and Cervical Cancer. HPV related Cancers in Ghana. Summary Report Update.* WHO, 2010. *Open Access data-See Appendix E*

The data depicted in tables 3 and 4 above show a grave health concern regarding cervical cancer in Ghana which requires every needed attention to find out causes of cervical cancer and then develop appropriate prevention programs. One major problem in developing countries, and especially in sub-Saharan Africa, is the absence of accurate population and health statistics. As such it may not be possible to reliably calculate incidence rates for the various cancers. In situation like this, hospital information is usually relied on as a measure of incidence (Nkyekyer, 2000). In their cross sectional study with a sample of 354 women aged 18 to 69 years residing in Moshi Rural District of Tanzania, Lyimo & Beran (2012) found that the estimated incidence rate was about 40 per 100,000 women which shows a high disease burden (Lyimo & Beran, 2012). In the US, cervical cancer cases are routinely reported to cancer registries such as the National Cancer Institute Surveillance, Epidemiology, and End Results program, and CDC-administered National Program of Cancer Registries (Saslow, 2002). A national cancer

surveillance system like that of the US can help policy makers and various stakeholders in Ghana to make informed decision about cervical cancer prevention programs. The absence of an actively promoted national cervical screening program is found to be the cause of lacks basic knowledge about risk factors for cervical cancer and a lack of information on screening age and intervals in Ghana (Abotchie & Shokar, 2009). A cross-sectional survey among 140 women in a Ghanaian University elicited information about knowledge, beliefs, and acceptability of cervical cancer screening, screening history, and sexual history. The age range was 20 to 35 years. Bivariate analyses conducted to identify factors associated with screening showed that prior Pap test screening rate was 12.0%. The women were unaware of local screening initiatives, and only 7.9% were aware of the link between HPV and cervical cancer. The most prevalent barriers were lack of awareness that the purpose of Pap screening was to diagnose cervical cancer, concerns about what others may think, and lack of information about how to obtain screening services. Although women perceived the benefits of screening, about 50% perceived themselves to be at risk. Barriers which negatively associated with screening were lack of belief that cancer was diagnosed by cervical screening, belief that Pap test was painful, and belief that the test would take away virginity (Abotchie & Shokar, 2009). Abotchie & Shokar stressed that college students were among the most informed group of women in Ghana (Abotchie & Shokar, 2009) but lack of knowledge about cervical cancer and the need for routine screening shows the deepness of lack of awareness among most women with little education (McFarland, 2003; Wellensiek, Moodley, Moodley, Nkwanyana, 2002).

Religious and Sociocultural Beliefs on Cervical Cancer Preventions in Ghana

People with different religious backgrounds can have different values and traditions and these differences can influence how such people follow advice from healthcare professionals. Religious beliefs can also play key roles in how disease is perceived and addressed in different cultures. It also includes traditions and values that may affect the understanding of individuals about the causes of illness, adherence to treatment and physician recommendations, or feelings of optimism or fatalism about disease outcomes (Fichter, 1981; McCaffery et al., 2003; Shiavo, 2007.p.76). Religious and spiritual factors are also relevant in medicine because they influence attitude or beliefs about the nature of illness as well as their ability to cope with disease or adhere to recommended treatments (Schiavo, 2007). It is documented that people with beliefs in supernatural powers may seek healthcare services but may also be content with pain and suffering (Fichter, 1981). Studies show that religious fasting can interfere with medication regimens in some cultures (Grissinger, 2007). Religious beliefs may influence a patient's understanding and significance of health, ways to deal with healthcare professionals, how to cope with illness, influences decision making, meaning, attitude toward death, and family's involvements (McCaffery, et al., 2003; Rosario, 2010; Sekyere, 2011; Shiavo, 2007). In some cultures, healthcare is found to be shared beliefs, values, and traditions of a group of people which may include or create expectations and assumptions about health, disease, and appropriate relationships and behaviors. For example, Rosario (2010) wrote that 80% of the Micronesia women identified religion as the source of the sense of morality associated with an extreme sense of shame about

something. Even though, some people knew that Pap test was highly beneficial they had negative stigma attached to unmarried women going for Pap screening due to their religious beliefs. Most participants (73%) attached the stigma of having had unprotected sex and possibly having acquired an STD to an unmarried woman seeking a Pap test. The same percentage, 73%, also attached the stigma of having multiple partners and behaving promiscuously to an unmarried woman seeking a Pap test. Rosario concluded that the purpose of the Pap test was misunderstood by 27% and 20% equated it with STD testing (Rosario, 2010). Ghanaian communities have various church groups and beliefs. Such a sense of shame or religious belief may affect Ghanaian adolescents' behaviors in seeking preventive cervical cancer care.

Even though little is known about how religious beliefs influence cervical cancer prevention in Ghana, religion is found to play a role in the advanced stage of cancer in Ghana (Sekyere, 2011). According to Sekyere, most of the Christians in Ghana seek help from religious leaders when they are sick (Sekyere, 2011). They believe that seeking healing from God comes first before western medicine therefore people spend time at prayer camps, and the hospital becomes the last resort when the condition is advanced or the disease reaches an incurable state. Most people still belief in Ghana's traditional religion so they use traditional medicine instead of orthodox medication. The herbal treatment and consultations of indigenous doctors are predominantly chosen as the first treatment plan and cost-effective. This contributes to people reporting at the hospital at an advanced stage (Sekyere, 2011) where the disease might be difficult to treat. Another

study in Ghana indicated that religious affiliation had significant effect on knowledge of AIDS and men's behavior towards AIDs (Takyi, 2003) due to perception.

Cultural Practices Within Religious Subgroups

Cultural values are essential in assessing people's health. Understanding a patient's practice of cultural norms can allow providers to build relationship to ensure effective patient-provider communication. Interventions to reduce health disparities need to address the physical, emotional, and spiritual health of individuals and families. It is also important to make connections with members in the community and identify conditions in the community (http://www.dimensionsofculture.com/culture-fact-sheets/). Beliefs which influence health behaviors in most people are often originated in their cultures passed down over the years through family health and healing practices regardless of race or ethnic origin. Such practices are common among religious subgroups. It is believed that Muslims descended from Africa, African American, Arab, Jewish, Asian and Native Indian ethnicities are examples of American cultural groups that still use natural remedies to maintain health as well as different types of poultices to cure certain illnesses before turning to modern medicine, regardless of their professions or educational level (http://nursesaida.wordpress.com/about/).

Beliefs and practices have been found to influence attitudes and experiences related to HPV testing. A study about 71 participants aged 20–59 years eligible for cervical screening within Greater Manchester (United Kingdom) was done to obtain screening status. Participants were recruited from social and community groups by ethnically matched community researchers, who conducted focus group discussions.

Participants from four ethnic groups (self-identified as white British, African Caribbean, Indian and Pakistani) with different age groups, marital/partner status and socioeconomic positions, were selected using principles of purposive sampling. The study used a nonrandom sampling of participants possessing certain characteristics to provide a range of demographic. McCaffery et al. (2003) examined attitudes about HPV testing of primary cervical screening among a sample of purposely selected women to provide contrasting religious and cultural backgrounds and experiences of interest to the research area method. The researchers found that women from all the groups, especially Indian and Pakistani highlighted the messages of distrust or infidelity that may be conveyed to one's partner by simply attending screening, particularly for women in long-term monogamous relationships. Among the Indian and Pakistani women, testing was also perceived to reflect nontraditional cultural or religious practices concerning sex and monogamy to their family and community. Attending for HPV testing and testing positive for HPV were identified as potentially communicating unwanted messages to one's partner, family and community (McCaffery, et al., 2003). Beliefs of Muslims were described by some of the Pakistani women as potentially prohibitive of screening, drawing on examples of the limits imposed on abortion, women visiting male doctors, and concerns that cervical screening may affect unmarried women's virginity. Sharia law was identified as particularly restrictive of sexually. However, others felt that Islamic beliefs would support HPV screening as good for women's health, and hence family health. The researchers further stated that among the white British women, taboos surrounding sex within Catholic families were also raised as potentially restrictive to

women participating in HPV testing (McCaffery, et al., 2003). A woman's limited access to health services in society and restrictions on married women may affect health seeking services especially for those who are not married to seek health services due to religious beliefs (Fatimi, & Avan, 2002; Stephenson, & Henninik, 2004) even if it comes to consulting a physician in urgent situations (Alix-Dancer, 2003; Van de Stuyft, Sorenson, Delgado & Bocaletti, 1996). Rosario (2010) wrote that "sense of shame" works as a self-monitoring system for a woman who uses shame to express reluctance to seek gynecological care. Such a belief is well-established in the woman's concern over how seeking sexual healthcare is perceived symbolically and collectively by the community based on the religiously-influenced cultural standards. Shame has to do with how one is seen by others, which in turn contributes to identity (Rosario, 2010). Shame may also be experienced by Ghanaian women, especially adolescent girls, seeking gynecological care. In some cultures, like Ghana, inappropriate sexual activities are perceived as promiscuous behavior within cultural beliefs about morality and virtue (Chavez, McMullin, Mishra, & Hubbell, 2001).

Cultural Beliefs and Personal Barriers

Disparities in cancer are caused by factors such social injustice and cultural beliefs (Freeman & Wingrove, 2005). Such beliefs can prevent women from getting information about their health. This lack of information together with cultural beliefs could lead many to seek home or traditional remedies to maintain health as well as different ways to cure some illnesses before turning to modern medicine, regardless of their professional occupation or level of education (Nyamongo, 2002). This can lead to

complications that may arise during treatments using traditional methods. These methods sometimes fail during treatments forcing women to seek professional healthcare when it is too late, with weakened immune systems, and therefore vulnerable to the risks of treatment. A study in the US found that racial, ethnic minorities and medically underserved groups are more likely to be diagnosed and die from cancer than the general US population (ACS, 2009). Statistics indicate that though the age-adjusted incidence of breast cancer among Latinas is lower than non-Hispanic Whites (*U.S. Cancer Statistics group, 2013*); Latinas are 20% more likely to die of breast cancer than non-Hispanic White women diagnosed at a similar age and stage. Differences in access to care and treatment likely contribute to this disparity (U.S. Cancer Statistics Group, 2013).

In some cultures, advice of the elderly women in the house is also very influential (Delgado, Sorenson, & Van der Stuyft, 1994) in seeking health services. Cultural beliefs also affect awareness and recognition of severity of illness, gender, language barriers, lack of care givers, and availability of service and acceptability of service (Aday & Anderson, 1974; Gordon, 1995). These factors could prevent or lead to delay in seeking treatment and are common among women and the health of their children (Chavez, Hubbell, McMullin, Martinez & Mishra, 1995; de Zoysa, et al., 1984; McNee, 1995; Kaona, Siziya & Mushanga, 1990; Sekyere, 2011). Level of education, parity and family size, and employment of the head of the family are also associated with health seeking behavior beside age, gender and marital status (Nyamongo, 2002; Yip, Wang & Liu, 1998; Thorson, Hoa & Long, 2000; Goldman & Heuveline, 2000). However, cultural practices and beliefs have been prevalent regardless of age, socio-economic status of the

family and level of education (Geissler *et al*., 2000; Van der Stuyft et al., 996; Perez-Cuevas, Guiscafre, Romero, Rodriguez, & Gutierrez 1996).

Chavez et al. (1995) wrote that cultural beliefs present barriers for seeking medical services among Latinas. Chavez et al. (1995) wrote that Latinas who believe that sex-related behaviors are the most important risk factors for cervical cancer are less likely to seek Pap exams than Latinas who disagree with such beliefs (Chavez et al., 1995). Even when Latinas have no knowledge of HPV, they may believe that multiple sexual partners are a cause of cervical cancer (Vanslyke et al., 2008). In contrast to breast cancer, Latinas have twice the age-adjusted incidence rate of cervical cancer compared to non-Hispanic Whites. Cervical cancer screening rates are traditionally low among Latinas but increasing (U.S. Cancer Statistics Group, 2012; 2013). Taking their country of origin into consideration, Mexican Americans and Puerto Ricans have twice the cervical cancer risk as Cuban Americans. The cervical cancer mortality rate among Latinas is 50% higher than in non-Hispanic Whites and the high rate of cervical cancer mortality has been attributed to the lower rate of Pap test screening and inadequate follow-up after abnormal pap tests (U.S.Cancer Statistics Group, 2013).

Child Marriage

In Ghana, most adolescent girls get married because of their parents' or guardians' command but not their own desires or wishes (UNGEI). Parents/guardians or other influential members of the household often select the spouse and determine the timing of marriage. In northern Ghana, Ezeh (1993) found that men had greater say in choosing a partner than women did. Report by the United Nations Girls' Education

Initiative (UNGEI) indicates that the Northern Region is one of the most deprived areas in Ghana. Research shows that the differences in the incidence of adolescent girls marrying under age 15 may be due to cultural and traditional practices as well as poverty where young girls are married to older men for financial or material gains (UNFPA, 2012). According to a study by the United Nations Fund for Population Activities (UNFPA, 2012), even though there is a change towards later marriage in many parts of the world, it is estimated that 82 million adolescent girls in developing countries between the ages of 10 and 17, will be married before their 18th birthday (UNFPA, 2012). It is estimated that by 2020, about 14 million adolescent girls will be married by their 18th birthday if current trends continue. Girls living in rural areas of the developing countries are twice as likely to be married before age 18 as their urban counterparts, and girls with no education are over three times more likely to get married than those with secondary or higher education (United Nations Fund for Population Activities, 2012).

In some countries, adolescents are given up in marriages (Haberlan, Chong, & Bracken, 2003). Marriage to older men or partner arrangements for adolescent girls, including bridal price, death rites (ritual sex, widow inheritance), taboos, traditional medicine or healers, substitution of wife/husband, make them more vulnerable to STDs (Bukali de Graca, 2002). An “experienced” man who might have had several sexual partners in his lifetime and as such vulnerable to STDs can infect the adolescent girl if the man is infected. Childbirth also increases STD infections. In 2008, adolescent girls in the developing countries had an estimated 14.3 million births. Of that estimate, 13.01 million occurred in Sub-Saharan Africa; South Central and Southeast Asia; and Latin America

and the Caribbean. About 35% of these births occurred in Sub-Saharan Africa (Guttmacher Institute, 2010) (http://www.guttmacher.org/pubs/FB-Adolescents-SRH.pdf). However other studies show that early childbearing can present an opportunity for cervical cancer preventive services. Del Castillo (1993) reported that young married Latinas were likely to have young children and prenatal care provided an opportunity for physicians to provide a Pap test (Del Castillo, 1993) and preventive healthcare can lead to multigenerational benefits.

Gender Inequalities

The 2012 World Development Report (WDR) on gender equality and development find that women's lives around the world have improved significantly but gaps remain in many areas including health and education (United Nations Fund for Population Activities [UNFPA], 2012; 2015). Typically, diseases among women are those associated with reproductive health. For example, the health consequences of gender-based violence, including rape, and sexual coercion are associated with other health conditions affecting women and sometimes their children. A woman who is raped or sexually coerced usually has little or no control to negotiate for protection which put her at risk of contracting STD like HPV and cervical cancer.

A study in Tanzania found that among some of the barriers to cervical cancer screenings were husband approval of cervical cancer screening, women's level of education, women's knowledge of cervical cancer and its prevention, women's concerns about embarrassment and pain of screening (Lyimo & Beran, 2012). Gender inequalities can also make people act differently because of their own gender and respond to people

with different genders differently. According to Lyimo & Beran (2012), women's preference for the gender of health provider and women's awareness of distance to cervical cancer screening services was associated (Lyimo & Beran, 2012). Of 354 women, about 40% preferred a female healthcare provider to perform cervical cancer screening.

Ankomah (2008) wrote that women are in a subordinate position regarding decision-making within the household in Ghanaian (Ankomah, 2008). Adolescent girls also face more reproductive health vulnerabilities than men. Biologically, women have two to four times higher risk of acquiring STD during unprotected sexual intercourse than men. Adolescent girls are 1.6 times more likely to be living with HIV than adolescent boys globally which make adolescent girls more susceptible to HPV infections (UNFPA, 2012). The 2012 World Development Report argues that gender equality is a "core development objective in its own right and it is also smart economics" (UNFPA, 2012). Ezeh (1993) wrote that spousal influence rather than being mutual was an exclusive right exercised only by the husband in Ghana and most Sub-Saharan African countries and that led to limited impact of family planning programs (Ezeh, A.C., 1993). In their studies about sexual health experiences of adolescents in three Ghanaian towns, Glover et al (2003) fount that both male and female adolescents accepted violence towards women (Glover, E.K. et al., 2003).

Polygamous Society

Culturally, in some Sub-Saharan Africa countries, polygamy is generally accepted. Multiple sexual partners are associated with risky behavior or immorality and

some people may continue to have multiple sexual partners throughout their life and therefore reinfect themselves and their partners (CDC, 2010; Thomas, et al., 2004). The risk associated with polygamous behaviors may increase a woman's chances of acquiring cervical cancer (Comaroff & Comaroff, 1991).

Social Stigma

Linking Pap tests and cervical cancer with morally questionable behavior may not motivate some women to undergo cervical cancer screening. For example, being labeled with an illness as "bad, immoral, or disgraceful" in a society can prevent an infected person to seek healthcare services (i.e. prevention, diagnosis, and treatment). A study showed that women who did not get screened often mentioned that they did not get tested because others would perceive them to be having sex, and if they were not sexually active, they did not need to be screened (Byrd, Peterson, Chavez, & Heckert, 2004). A study found that Latinas, especially immigrants are less motivated to proactively seek out Pap test screening due to the association of Pap test with sexual promiscuity. Married women are more likely than unmarried women to seek Pap test. Some women who are not married may not seek Pap test because they are not expected to be engaging in sexual activity before marriage. In some cultures, going for a Pap test is an implied admission of sexual activity, thus raising issues of guilt and shame (Comaroff & Comaroff, 1991).

In a multi-cultural society like Ghana with a high incidence rate of cervical cancer but low rate of Pap test screening, mortalities associated with cervical cancer can be catastrophic if there are no public educations and promotion about cervical cancer and its antecedents. Pap test presents unique opportunity to reduce the burden of HPV infection

and cervical cancer in Ghanaian women. However, Pap test among adolescent girls raises several ethical, cultural, religious, socioeconomic, and political challenges. Due to the route of transmission of HPV, Pap test screening among Ghanaian adolescents can be stigmatized as those going for the test as promiscuous. Also, in Ghana, an unmarried adolescent girl going for Pap test screening can be regarded as promiscuous and such stigmatization or social perception could prevent adolescent girls from preventive cervical cancer care. Researchers have documented these factors in detail using the HBM.

Challenges of HPV Vaccinations in Ghana

Although there are benefits associated with the HPV vaccine to prevent HPV infection, using it in Ghana may cause ethical challenges because of varying beliefs. One critic on the HPV vaccination in Ghana is Edwin (2010). She argues that routine HPV vaccinations in Ghana could encourage premarital sex among adolescents and give them implied permission to engage in risky sexual behaviors (Edwin, 2010). Knowing that HPV infection is sexually transmitted disease, adolescents going for HPV vaccination could also be seen as promiscuous. In addition, Edwin (2010) writes that because adolescents may not fully understand the efficacy of the HPV vaccine, they may over-generalize its protection to include other sexually transmitted disease and therefore practice unsafe sex with serious consequences. Because HPV vaccines are also not routinely recommended for administration to males except Gardasil (CDC, 2013), a polygamous society like Ghana should not solely rely on vaccinations but rather encourage Pap test screening among adolescent girls in order to reduce the incidence and mortality of cervical cancer. This can help to detect re-infections of HPV in curable states

from an infected partner if they engage in unprotected sex before reaching incurable states. The HPV vaccine does not eliminate the need for continued Pap test screening because about 30% of cervical cancers are caused by HPV types not included in the vaccine (CDC, 2011).

Health Belief Model Framework

A theoretical model that provided a better understanding of the experiences among adolescent girls in Ghana regarding Pap test screening was HBM. The HBM is a psychological model that sheds lights on factors for compliance with recommended health actions. For example, explaining and predicting health behaviors by focusing on the attitudes and beliefs of individuals. The fundamental concept of the original HBM is that health behavior is determined by personal beliefs or perceptions about a disease and the strategies available to prevent or decrease its occurrence (Hochbaum, 1958). Research shows that the HBM was developed in the 1950s as part of an effort by social psychologists in the United States Public Health Service to explain the lack of public participation in health screening and prevention programs. The HBM has since been adapted to explore a variety of long- and short-term health behaviors (Rosenstock, Strecher, & Becker, 1994; Rosenstock, Strecher, & Becker, 1988). The HBM can provide guidelines for program development which allows planners to understand and address reasons for non-compliance and commonly used theory in health education and health promotion (Glanz, Rimer, & Lewis, 2002; NCI, 2003). Iintrapersonal influences on behavior such as knowledge, attitudes, and perceptions, patient satisfaction, and social stigma affect the individual behavior of patients including health seeking behaviors and

adherence to treatment. The CDC writes that individual's knowledge, attitudes, and perceptions with health in general and with a specific illness influences one's behavior (CDC, 2012). These factors can influence health seeking, understanding of the diagnosis, understanding of treatment, treatment initiation, treatment adherence, and general interactions with healthcare providers (CDC, 2012). The key components and constructs of HBM are perceived threat; perceived susceptibility of the disease, perceived severity of the disease, perceived benefits, perceived barriers of recommended health action, self-efficacy, cues to action, motivation, and modifying or demographic and socio-economic variables. Modifying factors such as media, health professionals, personal relationships, and self-efficacy of recommended health action can also affect behaviors compliance. Each of these perceptions, or in combination, can be used to explain health behaviors (Bandura, 1977; Becker, 1974; Becker & Rosenstock, 1984; Rosenstock, Strecher & Becker, 1994). The conceptual framework for Pap test screening is based on the model by Bandura (1977) and an updated version of HBM by Rosenstock, Strecher, & Becker (1994).

It is well documented that cervical cancer prevention programs address several of these components. According to the HBM, individuals will be more likely to perform health-related behaviors if they perceive an illness as being serious, feel that there is a high risk of contracting the disease. They must also believe that the health action leads to a positive outcome that will outweigh any barriers encountered and can use cues to action to start the process and take the needed action (Burak & Meyer, 1997).

Perceived Susceptibility and Severity

Schiavo (2007) writes that the definition of health varies from culture to culture and region to region. Ethnic, religious, socioeconomic, and age-related factors influence perceptions about health and health behaviors (Schiavo, 2007). Other researchers write that perception and the cultural theory of risk in relation to risk-related policy making in the local context in which is an important element of everyday decision making remains understudied (Hirsch & Baxter, 2011). Studies show that for an individual to make an accurate assessment of disease risk they first need to be aware of relevant risk factors for the disease. Accurate perception of susceptibility to cervical cancer involves awareness that it is caused by sexually transmitted disease. Gerend & Magloire (2008) wrote that students who had high levels of HPV awareness (78%), HPV risk perceptions were positively related to behavioral risk factors such as multiple sexual partners (Gerend & Magloire, 2008).

Perception about cervical cancer risks may change if women know that STDs can cause cervical cancer. Few women in general public are aware that an STD causes cervical cancer (Marlow, Waller, & Wardle, 2007). Perceived susceptibility is important to many theoretical models of health behaviors including HBM and predicts participation in preventive behaviors (Becker, 1974; Katapodi, Lee, Facione, & Dodd, 2004) such as Pap screening and vaccination (Brewer et al., 2007; CDC, 2010; Chen et al., 2007). Weinstein (1999) wrote that in order for an individual to make an accurate assessment of disease risk they first need to be aware of relevant risk factors for the disease. Perceived cancer susceptibility is associated with awareness of personal behaviors and family

history (Weinstein, 1999) and perception of susceptibility to cervical cancer requires awareness that it is caused by an STD. In their cross-sectional study Gerend & Magloire (2008) found that students who had high levels of HPV awareness (78%) and HPV risk perceptions were positively related to behavior risk factors such as multiple sexual partners (Gerend & Maglorie, 2008).

Individual risk to illness is one of the more powerful perceptions in promoting people to adopt healthier lifestyles. Individuals normally change their behaviors if they perceive the risk to be great so as to decrease or prevent the risk. For example, the perceived risk of hepatitis B was seen to prompt men who have sex with men (MSM) to be vaccinated against hepatitis B (de Wit et al., 2005) and to use condoms in an effort to decrease susceptibility to STDs (Azizi, Rios-Soto, Mubayi, James & Hyman, 2017). Perceived susceptibility motivates people to be vaccinated for influenza (Chen et al., 2007). Individuals believing that they are at risk for a disease will be more likely to do something to prevent it from happening (Rose, 1995; Maes & Louis, 2003) and will not take any action if they believe that they are not at risk. This situation was found among Asian American college students. The students perceived that the HIV/AIDS epidemics was not an Asian problem therefore their perception of susceptibility to HIV infection was low and not associated with practicing safer sex behavior (Yep, 1993).

Generally, perception of increased susceptibility or risk is associated with healthier behaviors and decreased susceptibility to unhealthy behaviors. A study among college students indicated that the perception of susceptibility was not often associated with the practice of healthier behaviors (Courtenay, 1998) even when the perception of

risk was high. For example, although college students considered themselves to be at risk for HIV because of not practicing safe sex, they still did not change their behaviors to practice safer sex (Lewis & Malow, 1997) or did not stop tanning even though they perceived themselves to be at increased risk for skin cancer (Lamanna, 2004) or stop smoking even though they perceive it to be a risk factor for lung cancer (CDC, 2012).

Presently, little is known about adolescent girls' perception about cervical cancer in Ghana. Studies were done on older Ghanaian women's perceptions about cervical cancer (Abotchie & Shokar, 2009). In their cross-sectional observation study aimed at estimating the HPV prevalence and its determinants among a sample of Ghanaian women, Domfeh et al (2008) found that knowledge and attitude about cervical cancer among some college women in Ghana was very low while HPV prevalence was high not only among young women, but also in middle and old age groups (Domfeh et al., 2008). In their study about cervical cancer knowledge, perception, and screening behavior among female university student in Ghana, Binka, Narko, & Doku (2016) reported that 55.3% of the participant disagreed that cervical cancer can be transmitted sexually while 81% of the participants disagreed that a person who is unaware of cervical cancer cannot contract it. Another study in Italy assessed knowledge, attitudes, and behavioral intention towards human HPV infection and vaccination in a random sample of 1348 adolescents and young women aged 14–24 years. A self-administered anonymous questionnaire covered demographics; knowledge about HPV infection, cervical cancer, and HPV vaccine; the perceived risk for contracting HPV infection and or for developing cervical cancer, the perceived benefits of a vaccination to prevent cervical cancer, and willingness

to receive an HPV vaccine. According to the authors, only 23.3% had heard that HPV was an infection of the genital mucosa and could cause cervical cancer. Older age without a parent who was a healthcare professional, having had a personal, familiar, or friendly history of cervical cancer, and need of additional information were predictors of the perceived susceptibility of developing cervical cancer. The significant predictors were having at least one parent who was a health care professional. A high perceived risk of contracting HPV infection and developing cervical cancer was associated with a high belief towards the utilization of HPV vaccines to prevent cervical cancer (Di Giuseppe, Abbate, Liguori, Albano, & Angelillo, 2008).

Since initial reviews showed little about cervical cancer screening status among Ghanaian women, with lack of national cervical cancer screening programs, this researcher assumed that the target population would not assess their chances or would have less knowledge about their chances of getting cervical cancer. It was further hypothesized that there would be less perceived susceptibility or no judgment as to the severity of getting cervical cancer. In their study to determine factors affecting uptake of cervical cancer screening among clinic attendees in Trelawny, Jamaica, Bessler, Aung & Jolly (2007) explored knowledge about participants who had ever had Pap smear and those who had Pap smear within last year. Bessler et al (2007) reported that women understood their susceptibility to and the severity of cervical cancer. Those who had never had a Pap test perceived themselves to be less susceptible or at a lower risk for cervical cancer than women of their age. The women agreed about benefits associated with Pap test screening and regular Pap tests which would provide them with peace of

mind and find a problem before it develops into cancer (Bessler et al., 2007). Binka et al (2016) also found that majority female university students in Ghana recognized that regular screening for cervical cancer would be of great benefits to them in future. According to Bessler et al (2007) there was a significant difference of knowledge about risk factors for cervical cancer among women who said that having multiple sex partners could result in cervical cancer. Among those who had a Pap smear within the last year, there were no significant differences in the distributions of any of the cervical cancer risk factor categories. However, 75% of the total sample reported sex at a young age to be a risk factor for cervical cancer (Bessler et al., 2007). Studies show that in order to make an accurate assessment of disease risk, one first need to be aware of risk factors for the disease. Perceived susceptibility is associated with awareness of personal behaviors and family history when dealing with cancer. An accurate perception of susceptibility to cervical cancer needs awareness that STDs cause it. In their study Gerend & Magloire (2008) reported that students who had high levels of HPV awareness (78%), HPV risk perceptions were positively related to behavioral risk factors such as multiple sexual partners (Gerend & Magloire, 2008).

Perceived Seriousness

The construct of perceived seriousness speaks to an individual's belief about the seriousness or severity of a disease. Although the perception of seriousness is often based on knowledge or medical information, it may also come from beliefs that a person has about the difficulties a disease would have on his or her life in general (McCormick-Brown, 1999). A cross-sectional survey among 225 self-identified lesbians who

completed an online questionnaire indicated that fear was a contributing factor for lack of routine Pap test screening. Of the respondents, 71% reported receiving a routine Pap screening test in the past 24 months, and 29% reported receiving a Pap screening test more than 24 months ago or never had Pap test. According to the study, routine screeners were more likely to be older with a statistical significance with a p-value of less than 0.01, white ($p = 0.04$) and college graduates with a p-value of less than 0.01 than non-routine screeners. Those who had routine screening and did not go for screening were more likely to delay seeking healthcare services because of fear of discrimination ($p < 0.01$) and were less likely than routine screeners to disclose sexual orientation to their primary care physician ($p < 0.01$). After adjusting for age, race, and education, non-routine screeners perceived fewer benefits from ($p < 0.01$) and more barriers ($p < 0.01$) to Pap screening tests. They were also less knowledgeable about screening guidelines ($p < 0.01$) than routine screeners, but there was no difference in perceived susceptibility ($p = 0.68$), perceived seriousness ($p = 0.68$), or risk factor knowledge ($p = 0.35$) of cervical cancer.

Perceived Threat

Most people normally change their behaviors if their perception to the threat is serious and when they think they are at an increased risk. Individuals' perception about lung cancer risks could motivate them to quit smoking (Krosnick et al., 2017). A study about an outbreak of bovine spongiform encephalitis (BSE) also known as mad cow disease in Germany changed people's perception of cow meat based on the deadly disease (Weitkunat et al., 2003). Although mad cow disease does not occur in people,

research suggests that eating cattle with the disease can result in variant Creutzfeldt-Jakob disease (CJD). Like CJD, transmissible spongiform encephalopathies (TSEs), also known as prion diseases, are a group of rare degenerative brain disorders characterized by little holes that give the brain a "spongy" appearance. It is a rare type of dementia that affects about 1 in every 1 million people each year. Variant CJD, like BSE, affects the brain which causes little holes that make it appear sponge like. Both diseases are untreatable and fatal (National Institute of Neurological Disorders and Stroke, 2007).

Perceived threat of contracting this deadly disease through eating beef was found to be one of the reasons why most people stopped eating meat in Germany (Weitkunat et al., 2003) during that time. Perceived threat can also be understood through the example of colorectal cancer. Contracting a colorectal cancer is associated with behavior change among colon cancer survivors (Mullens et al., 2003). Studies show that colorectal cancer is a serious disease with a high risk of recurrence. In 2018, colorectal cancer was the second leading causes of cancer death in women after breast cancer (Bray et al., 2018, WHO, 2018). Therefore, perceived threat of recurrence increases the probability of behavior change among people who were previously treated for this disease. Behavioral change among such people normally includes diets, exercise, and weight (Mullens, McCaul, Erickson, & Sandgren, 2004). However, other researchers found that increased perception of threat or susceptibility does not always lead to behavior change (Gerba, Row, & Haas, 1996; Hanson & Benedict, 2002).

In their study to determine the perceptions of risk and barriers to previous cervical cancer screening by women attending a clinic in Eldoret, Kenya, Were, Nyaberi, &

Buziba, (2011) reported that perception of being at risk was significantly associated with a felt need for screening with a p-value of 0.002. According to the study, this association persisted only for women who reported to have multiple lifetime sex partners with a p-value of 0.005. The authors used a cross-sectional questionnaire survey involving a sample of 219 consenting non-pregnant women about perceptions on cervical cancer risk, barriers to screening and previous screening. Of 219 women interviewed, 12.3% of participants had screened before. Women of over 30 years were more likely to have screened before (*p*-0.012). Although only 22.8% felt that they were at risk of the cervical cancer, 65% of all participants wished to be screened. Fear of abnormal results and lack of finances were the collective barriers to screening reported by 22.4% and 11.4% of respondents, respectively (Were, Nyaberi & Buziba, 2011).

Perceived Barriers

Behavior change can be difficult to be initiated. Perceived barriers to change can prevent one from seeking healthcare services. This is an individual's own evaluation of the restrains to prevent him or her to adopt a new behavior. Researchers have written that perceived barriers are known to be the most significant construct in determining behavior change (Janz & Becker, 1984) and reasons why most women fail to seek cervical cancer screening. Barriers for the Pap test screening have shown to include lack of knowledge, language issues, and fear of pain, feeling of embarrassment, and cultural values, and environments (Dodd, et al., 2001). For example, studies have shown that women who perceived that Pap test screening process as painful and embarrassing due to cultural values, been seen by male healthcare providers had lower rates of routine cervical cancer

screening (Abdullahi, Copping, Kessel, Luck, & Bonell, 2009; Ackerson, 2010). Other researchers have also reported that childhood sexual trauma, abnormal Pap test results indicated the presence of cervical cancer have been the reasons why women do not seek cervical cancer screening (Ackerson, 2010; Were, Nyaberi &Buziba, 2011).

The cultural environment involves personal values, beliefs, and practices determined by racial, ethnic, or religious background (Dodd, Janson, Carrieri-Kolhman et al., 2001). Cultural practices which include dealing with natural life events, birth, death, illness, suffering, and are among the most influential factors in determining health behaviors (Callister, 2006; Luckman, 1999). Characteristics of the physical, social, and cultural environments are relevant to effective cervical cancer because they are a potential source of both direct and indirect barriers to effective cervical cancer screening. A study found that lack of cervical cancer screening was due to strong fatalistic belief that the development of cancer was just bad luck and the women did not want to know if they had cancer (Behbakht, Lynch, Teal, Degeest, & Massad, 2004). Personal barriers also include discomfort at a doctor's touch, the male health provider, fear of finding cancer or other diseases, embarrassment, and pain (del Carmen, et al., 2007; Coughlin, Breslau, Thompson, & Bernard, 2005).

In the US, barriers to cervical cancer screening include cultural, beliefs, and personal factors such as origin of birth, English language proficiency, level of acculturation, and patient-doctor relationship; socioeconomic (i.e., education level, income level, medical insurance, and medical costs); and institutional (i.e., physician recommendation and access to healthcare and regular source of care (Akers, Newman &

Smith, 2007; Moshkovich, et al., 2015) and poverty. Cultural preferences can also affect illness management or medication compliance. For example, Women from Islamic and African cultures who have vaginal yeast infections have been reported to prefer oral medications to inserting medications vaginally (Grissinger, 2007).

A study among women in a rural district of Tanzania to determine the most factors related to cervical cancer uptake found several perceived barriers to cervical cancer screening (Lyimo & Beran, 2012). According to the study, about 23% of the participants had obtained cervical cancer screening. Husband approval of cervical cancer and its prevention, women's level of education, women's level of knowledge of cervical cancer and its prevention, concern about embarrassment and pain of screening were found to be barriers to cervical cancer screening. Women's preferences for the sex of healthcare provider, awareness of and distance to cervical cancer screening services were other barriers to found. A logistic regression analyses showed that only knowledge of cervical cancer and its prevention (OR=8.90, 95% CI= 2.14-16.03) and distance to the place of cervical cancer screening (OR=3.98, 95% CI=0.18-5.10) were significantly associated with screening uptake (Lyimo & Beran, 2012). Another study found that pain, cost, and knowledge about where to go for cervical cancer screening were associated with barriers of cervical cancer screening. These variables showed statistical significance associations among women who had Pap test and those who did not have Pap test screening. Comparing women who had ever had a Pap test with women who had never had Pap test, those who never had Pap test reported that worry, painful test, being examined by a male health provider, fear of test results, embarrassment, not knowing

where to go for a Pap test, assumptions that the woman is having sex, not believing it is important for a woman their age, and distrust of labs that assess the tests had negative effect of cervical cancer screening (Lazcano-Ponce, Moss, Alonso de Ruíz, Saleroom Castro, & Hernández Avila, 1999; Leyva, Byrd.& Tarwater, 2006). Ackerson (2012) writes that personal reflections on one's approach to conduct gynecologic exam and how it is performed might prevent unwanted memories to make that visit a positive experience and help repeat screening behavior (Ackerson, 2012).

In their study, Bessler et al. (2007) determined factors that affected cervical cancer screening among women clinic-attendees ages 25 to 54 years in Jamaica and to provide information to stakeholders in order that cervical cancer screening services could be evaluated and improved. The authors hypothesized that the factors influencing women's decisions to screen would fall under three major categories which included demographic, psychosocial, and organizational. The demographic category included factors such as income level, education level, and marital status (Bessler et al., 2007). The psychosocial category included beliefs about susceptibility to and the severity of cervical cancer, general knowledge about cervical cancer and cervical cancer screening, and barriers to screening included fear of pain and embarrassment. The organizational category included barriers such as limited access to testing facilities and limitations in services. Bessler et al (2007) reported that 42% of the total study population indicated that they feared their healthcare providers would find cervical cancer as the result of a Pap smear and 46% feared the pain of a Pap test. Twenty four percent of the participants reported never receiving Pap test results. According to the study, there were significant

differences in the distributions of women who found it too far to travel to get a Pap smear ($p<.05$). Others felt that they needed more information about Pap test whilst others said they had difficulty talking to a healthcare provider about Pap smears and cervical cancer (Bessler, Aung & Jolly, 2007). Fear of losing virginity was also found to be a perceived barrier to Pap screening. Among the participants, 36% agreed that if a woman had not had sex, a Pap test would take away her virginity. Bessler et al (2007) found that 32% of women reported that being examined by a male provider would discourage them from getting a Pap test. In addition, among the participants, 38% agreed that if a young, unmarried woman goes for a Pap test, everyone will assume she is having sex. According to Bessler et al. (2007), being worried about the test and feeling embarrassed were also found to be barriers to screening and should be addressed in future interventions. Using the HBM to examine and predict college women's cancer screening beliefs and behavior, Burak & Meyer wrote that fear of pain and embarrassment were barriers of pap tests. The authors reported that those barrier beliefs were greatest among women who had never had a Pap test (Burak & Meyer, 1997).

Other researchers have also documented negative social pressure from male partners (Lazcano-Ponce, Moss, Alonso de Ruíz, Saleroom Castro, Hernández Avila, 1999; Leyva, Byrd & Tarwater, 2006) as a barrier to screening. Access to healthcare and cost of service has been barriers for many women (Abotchie & Shokar, 2009; Agurto, Bishop, Sanchez, Betancourt & Robles, 2004; Lazcano-Ponce et al., 1999; Leyva, Byrd & Tarwater, 2006); as well as lack of doctor's recommendations (Lazcano-Ponce et al., 1999; Leyva et al., 2006).

A study about Pap smear and cervical cancer in Botswana found that only 40% of participants had ever had Pap tests and the major barriers to obtaining Pap tests included lack of knowledge about Pap tests, provider attitudes, and limited access to physicians (Ibekwe et al., 2011). The objectives of the study were to describe the women's *perceived barrier* to cervical cancer and the association between socio-demo-graphic characteristics to cervical cancer. Reasons for limited knowledge included cultural norms of secrecy, lack of recommendation from healthcare providers, and policy makers' limited attention to cervical cancer (Ibekwe et al., 2011). Providers' major barriers to providing Pap tests were found to include clients' lack of knowledge of Pap test, providers' inability to see the importance of Pap smear tests, and workload and shortages. Cervical cancer screening can improve if these barriers that prevent women from doing cervical cancer screenings especially misconceptions and cultural beliefs are addressed (Ibekwe et al., 2011).

Cues to Action

The HBM suggests that behavior is also influenced by certain events, incidence, or reminders. Cues to action are events, people, or things that influence or motivate people to change their behavior. Graham (2002) gives examples as including illness of a family member, media reports (Graham, 2002), mass media campaigns pictures depicting a disease or an illness, advice from others, reminder postcards from a health care provider (Ali, 2002) or health warning labels on a product. It is believed that adolescent girls in Ghana would adhere to Pap test if recommended by friends, family members, health care providers, teachers, religious leaders, and elders in their community. Having a display of pictures depicting a cervical cancer in high school campuses is an example of cue to

action which can motivate students to practice safer vaginal intercourse. Weinrich et al (1998) write that knowing a church member with a prostate cancer is a significant cue to action for African American men to attend prostate cancer education programs (Weinrich et al., 1998).

In an attempt to explore how women in rural Malawi make health-seeking decisions regarding cervical cancer screening using qualitative research methods, Fort et al (2011) found that the primary *cue to action* for cervical cancer screening was symptoms of cervical cancer. Fort et al (2011) reported that *major barriers* to seeking preventative screening included low knowledge levels, low *perceived susceptibility*, and low *perceived benefits* from the service. Study participants did not view cervical cancer screening as critical healthcare issue. The authors reported that cervical cancer screening services could increase if women were recruited while visiting the hospital for a different service. The authors recommended that the aims of healthcare providers and educators should target perceived susceptibilities among their patients, including knowledge levels and personal risk assessment. According to the researchers, creating awareness and continued support for cervical cancer screening programs would increase screening uptakes and decrease preventable deaths from cervical cancer in Malawi (Fort, Makin, Siegler, Ault & Rochat, 2011). According to Austin, Ahmad, McNally, & Stewart (2002), physician recommendation is one of the most important *cues to action.* Gichangi et al (2003) also reported that 82% of their study participants received Pap test screening information from healthcare providers (Gichangi et al., 2003). Leyva et al. (2006) write about greater need for better communication between the healthcare provider and the

patient, especially if doctors are to provide recommendation to increase the possibilities of accepting the importance of screening (Leyva et al., 2006). Communications about risk are often aimed at helping individuals to understand risks they face with the belief of making behavioral changes or safer choices. Weinstein (1999) writes that decisions about personal risks require minimum information about the nature and likelihood of possible negative consequences (Weinstein, 1999). To explore personal influences regarding Pap smears, Ackerson, Pohl, & Low (2008) qualitatively studied low-income African American women between 21 and 37 years of age who did and did not obtain Pap smears at a health department about their social influence, previous health care experience, and assessment about Pap smears and cervical cancer. Women were found to be socially influenced by their family and their physician. It was concluded that exploring beliefs associated with Pap smears and perceptions of vulnerability to cervical cancer, giving correct information and counseling may increase Pap smear screening in women (Ackerson e t al., 2008).

Self-Efficacy

Self-efficacy is the perceived ability to take on a health behavior when confronted with challenges to engage in the behavior. Bandura emphasized that in assessing these challenges, there is a need to decide what the individual can do versus will do (Bandura, 1986; Bandura, 1997; Hogenmiller et al., 2007). If a person perceives that a new behavior is useful (perceived benefit) but does not think he or she is capable of doing it (perceived barrier), then it is most likely that the recommended behavior change will not be tried (Bandura, 1977). Low rates of Pap test screening are associated with late diagnosis and

increased mortality if not found in curable stages. Self-efficacy predicts several health behaviors (Weller & Campbell, 2009).

Being able to know the benefit (s) of treatment of a disease may also influence one's belief of being able to seek treatment or change behavior. Wong, Wong, Low, Khoo & Shuib (2009) reported that a lack of knowledge on cervical cancer and the Pap smear test was found among the respondents and women who did not have a clear understanding of the meaning of an abnormal cervical smear and the need for the early detection of cervical cancer (Wong, Wong, Low, Khoo & Shuib, 2009)

Perceived Benefit

Most people usually adopt healthier lifestyles when they believe that the changed or the new behavior will prevent or decrease their chances of developing a disease. In order for a new behavior to be adopted, a person needs to believe that benefits of the new behavior outweigh the consequences of continuing the old behavior (CDC, 2004). If women belief that anticipated benefit of doing behaviors to prevent cervical cancer outweigh the barriers to prevent the new behaviors, they may be more likely to obtain cervical cancer screening test. For example, women must believe that recommended preventive behavior would be beneficial to prevent or reduce the risk of getting cervical cancer. Ibekwe, Hogue, Ntuli-Ncobo, & Hogue (2011) explored that either screened or never screened participants overwhelmingly agreed or strongly agreed that it was important to do cervical cancer screening (Ibkwe, et al.,2011). The participants in both screeners and never screeners believed that it was important to seek cervical cancer screening because it could detect changes in the cervix when it is curable if found early.

This study was in agreement with studies by Abotchie & Shokar (2009) who reported that women at the University of Ghana perceived Pap test to be beneficial to prevent cervical cancer. Leyva, Byrd, & Tarwater (2006) also reported that majority of their study participants agreed that Pap test screening would give them peaceful mind, detect a problem before it became cancerous and necessary even without family history of cancer (Leyva et al., 2006).

The incidence, prevalence or morbidity, and mortality rates of cervical cancer can motivate adolescent girls to seek Pap test. The HBM indicates that people engage in health seeking behavior if they perceive benefits to themselves from that behavior. It is assumed that adolescent girls in Ghana will seek cervical cancer screening if they know that early diagnoses will prevent cancer.

In their studies to ascertain knowledge and beliefs of college women in Ghana regarding cervical cancer preventions, Abotchie & Shokar (2009) found that the students of the University of Ghana perceived that cervical screening was beneficial and suggested that a program of public education national screening program would likely increase screening uptake and routine screening among women (Abotchie & Shokar, 2009). Perceived benefits are believed to play important roles in the adoption of secondary prevention behaviors, such as screenings mammography and Pap smear. Studies have shown that the earlier breast cancer and cervical cancer are found, the greater the chance of survival. Breast self-examination (BSE) is effective way to find breast cancer early when it is done regularly and correctly when it is easier to treat before it feels or causes

symptoms (CDC, 2013). BSE is done regularly among women who believe in the benefits about BSE and mammography do (CDC, 2013).

Colonoscopy requires few days of preparation before the procedure is completed (ACS, 2012). This procedure is lengthy and regardless of its inconveniences, it is presently the effective method for early detection of colon cancer which is the second leading cause of cancer among women worldwide after breast cancer (Bray, et al, 2018; WHO, 2012; 2013 a & b). Colon cancer has about 90% cure rate when detected early but only few (36%) of people over age 50 (who are most at risk) go for the screening (New York Presbyterian Hospital , 2006).

Cervical Cancer is preventable if detected early or in a curable stage but fatal disease if not detected early. Cultural beliefs, socioeconomic, and other environmental factors which may not emphasize early cervical cancer screening and treatment can derail the objective "C-15" of Healthy People 2020 which targets Pap test screening to 93% (http://healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=5). It was also assumed that the low rates of cervical cancer screening among Ghanaian women, specifically among adolescent girls would be overcome through health education and promotion and governmental interventions. Due to different ethnicities, it is believed that educating all stakeholders (religious leaders, parents/guardians, friends, and teachers) about cervical cancer and the benefits of HPV screening would increase screening rate and decrease incidence and mortalities of cervical cancer in Ghana. Also, gaining knowledge about Western medicine and the benefits of HPV screening can change

religious and cultural beliefs which could lead to positive behavior changes about cervical screening in the various Ghanaian communities regarding Pap test.

Schools offer opportunities for many students to learn about life skill and healthy lifestyle to engage in healthy behaviors. The educational settings where I recruited sample can also be used to provide health education and promotions about the benefits of cervical cancer screening. In addition, schools provide important ways for adolescents to promote lifelong healthy behaviors and also provide places for students to engage in healthy behaviors such as cervical cancer preventions which can be emulated in Ghana.

Summary and Transition

Cervical cancer remains an emerging public health problem in the Sub-Saharan Africa where over 86% of the global burden occurs annually but screening programs have been non-existent or ineffective (WHO, 2010a). The problem is even more alarming in Ghana where there are no national cervical cancer prevention programs. In Ghana, cervical carcinoma is the most common gynecological cancer, especially for women in their reproductive ages (WHO, 2010a) with most patients presenting with advanced disease (Nkyekyer, 2000) due to lack or inadequate screening. HPV is currently known to be the single most important cause of cervical cancer and Pap test offers opportunities to reduce the burden of HPV infection and cervical cancer among women (Roye, Nelson, & Stanis, 2003; CDC, 2010; WHO, 2018). However, cervical cancer is preventable when detected in early stages (WHO, 2018; Likes & Itano, 2003). Efforts to reduce cervical cancer rates in Ghana need to overcome stigma associated with Pap test among adolescents, lack of resources in health systems to improve knowledge about HPV

testing. Social and the emotional suffering due to cervical cancer could also be prevented through early diagnosis and treatments. Population-based cancer registries which are important surveillance tools to measure the impact on cancer rates of public health interventions such as screening can help Ghana to provide needed prevention programs. Due to the significant number of adolescents living in developing countries who are at risk for STDs like HPV infection, efforts to help prevent the epidemics of cervical cancer are needed. This involves providing them with access to information and resources as well as providing environments which are conducive and understanding of adolescent and their sexual and reproductive health needs. Educating adolescents about negative health effects associated with unprotected sexual intercourse can increase their awareness of risky sexual behaviors and also deal with peer pressures and sexual behaviors in a relationship. Some adolescents also face challenges with family, religious or cultural values. Engaging in open communication and accurate information from members in the communities can increase their chances to delay sexual activities and use protections during sexual intercourse. And if sexually active, would not have to worry about stigmatization to go for cervical cancer screening if community members are involved. Recommendations from healthcare providers increase patients' preventive healthcare services. Healthcare provider reminder about the cervical cancer screening (CDC, 2012; Juon, Seung-Lee, Klassen, 2003; Byrd & Leyva, 2006) has been used to raise screening rates in communities in other parts of the world (Byles, Sanson-Fisher, Redman, Dickinson, & Halpin, 1994). In some cultures, healthcare decisions are made collectively and patients may not feel comfortable making a decision without consulting families,

influential religious or spiritual leaders, or traditional healers. Research shows that although Hispanics share a strong heritage that includes family and religion, each subgroup of the Hispanic population has specific cultural beliefs and customs. Older family members are respected and often consulted on important health issues. Fatalistic views are also shared by many Hispanic patients who view illness as divine punishment for sinful behavior and may prefer to use home remedies and consult a traditional healer for treatment (http://www.cdc.gov/healthycommunitiesprogram/tools/pdf/hispanic_latinos_insight.pdf)

Despite findings from studies in developed countries indicating associations between adolescent risk-taking behaviors and STD infections, little is known about studies in Ghana to find relationships among adolescent girls and cervical cancer prevention. To date, studies in Ghana have mainly addressed HIV/AIDS knowledge, condom use, and determinants of other factors to prevent HIV infection among adolescents. This review showed that a gap existed as to what extend knowledge, culture, attitude, and belief affected Pap test screening among adolescent girls in Ghana which warranted this dissertation. Quantitative method was used to gain the understanding of factors that affected cervical cancer prevention among adolescent girls in Ghana and the method of study is detailed in chapter 3 below.

Chapter 3: Research Method

Introduction

The purpose of this study was to examine whether inner-city adolescent girls in Accra, Ghana had intentions to seek Pap test screening and determined how knowledge, culture, attitude, and religious beliefs affect their intentions to seek Pap test screening. In the previous chapter, I presented various studies about epidemiology and risk factors for HPV and cervical cancer as well as how knowledge, culture, attitude, and beliefs may affect cervical cancer screening. The HBM was also discussed in detail, including similar studies using the HBM. I also discussed the effectiveness of Pap text screening and how it has been credited with the reduction of cervical cancer deaths in recent years. Data about cervical cancer among Ghanaian women were also presented as well as a lack of literature about Pap test screening among Ghanaian adolescent girls. In this chapter, I discuss the method that was used to collect data about the study. I also explain the data collection, data management, and data analysis that were implemented.

Research Design and Approach

Numerous and diverse research methods are available, and each method has its associated strengths and weaknesses. In this research, a cross-sectional design with a quantitative method was used in conducting the study. The aim of the study was to discover the status of Pap test screening among the respondents. A quantitative method was used to test hypotheses and examine relationships among variables and Pap test screening among the respondents. Quantitative data have the potential to provide measurable evidence, to determine possible causes and effects, to replicate and generalize

the study results to the population, and to provide information about the depth of experiences (Steckler, McLeroy, Goodman, Bird, & McCormick, 1992). With quantitative methods, individual measures were created, taking into account the unique aspect of study. This study involved a semistructured questionnaire to give better understanding of participants' underlying attitudes and behaviors of Pap test screening. Studies have shown to be effective when exploring and understanding people's beliefs, experiences, attitudes, behavior, and interactions (Purmessur & Boodhoo, 2008). A similar study has also been used to study attitudes to HPV testing among women with different backgrounds (McCaffery et al., 2003).

Methodology

Target Population

Researchers have shown that the development of an early familiarity with the culture of participating institutions before the first data collection occurs by researchers of qualitative studies helps to promote confidence that the observable facts under study are accurately recorded (Lincoln & Guba, 1985). Lincoln and Guba (1985) further asserted that meetings between the researcher and the participants help the researcher to gain an adequate understanding of an institution and to establish a relationship of trust between the parties involved. However, dangers may emerge if too many demands are made on the staff responsible to allow the researcher access to the institution (Lincoln & Guba, 1985; Silverman, 2000). In order to gain access to and obtain basic information about the study site, I visited a senior high school in Accra, Ghana where samples of this study were drawn. As the researcher, my background facilitated access to the population

and credibility. I was born in Ghana and lived, attended high school, and also worked in Accra, Ghana before migrating to study abroad in 1992. The lifestyles of high school students in Accra, Ghana are well known to me as the researcher.

Setting and Sample Size

The participants for this study were adolescent girls in senior high schools in the Accra metropolitan areas in Ghana. The ages of the participants included in the study were 16 to 20 years old, and their educational levels were 10^{th} to 12^{th} grades. The participants were proficient in the English language, both verbal and written, because English is the official language of Ghana. The sample size was 155 participants.

Instrumentation and Operationalization of Constructs

Knowledge, Attitudes, and Practices Questionnaire

A self-administered questionnaire based on the study by Ali-Risasi et al. (2014) and demographic characteristics in a Ghanaian context were used for this study. The survey instrument was an open access study declared by the authors (see Ali-Risasi et al., 2014). There were total of 30 items in the questionnaire, including demographic information, Pap test knowledge, and knowledge about risk factors for cervical cancer, sexual behaviors, religious beliefs, attitudes, and practices. With regards to cervical cancer knowledge, the questionnaire asked if participants knew diseases of the genital tract, if they had ever heard about cancer of the cervix, how they had heard about it, if they knew the causes of cervical cancer, how cervical cancer could be prevented, if they heard about a Pap test/smear, if they knew someone in their close circle who had cervical cancer, and if they knew that suspect lesions could be detected early. Questions about

attitude included what participants would do in case of vaginal bleeding between periods, if participants were willing to regularly consult a medical doctor for screening of cervical cancer, if participants would want a national program to be made available, and if participants were willing to get Pap test/smear. Practice about cervical cancer prevention questions included the last gynecological examination, if participants smoked, how many sexual partners participants had in the last year, if their partners had another partner besides them, and if participants got a Pap test/smear. The responses were yes/no and open-ended responses (see Appendix B, additional Files 1 and 2) for scores and expected answers.

Pap Test Knowledge Variables

Items were adopted from Ali-Rises et al. (2014) regarding knowledge, attitude, and practice questions were used to assess over all knowledge about Pap test screening status. Some of the items included which diseases of female genital tracts did participants knew, if they had ever heard about cancer of the uterine cervix, how they heard about it, if they heard about a cervical cancer smear, if they knew that suspect lesions could be detected early, if they had ever got a Pap test/smear, and if they were willing to get a Pap test/smear. The responses were yes/ no and multiple responses (see Appendix A).

Pap Test Knowledge About Risk Factor Variables

Participants were asked if they knew diseases of the female genital tract, if they had heard about cancer of the uterine, how they heard about it, if participants smoked, if they knew the causes of cervical cancer, how cervical cancer could be prevented or

treated, and if they knew that suspect lesions could be detected early. The responses to these questions were "yes/no" and multiple responses (coded as 1/0 & 1-3).

Cervical Cancer Risk Knowledge Variables

The variables used to measure knowledge of risk factors for cervical cancer included the number of sexual partners participants had in the last year, if their partners had other partner beside them, and if they smoked. The responses to these questions were "yes/ no". Some of the items were if they had ever heard about cervical cancer before and how they heard about it (e.g., through oral communication, newspaper television, radio medical doctor). Participants were also asked about how they thought cervical cancer could be prevented (multiple responds) and if they knew anyone in their close circle who had cervical cancer with a "yes/ no" answers (coded as 1/0).

Perceived Susceptibility to Cervical Cancer Variables

The variables used to measure perceived susceptibility to cervical cancer were what participants would do in case of vaginal bleeding between periods, if participants were willing to regularly consult a medical doctor for screening of cervical cancer, if participants had ever had a Pap test, if they were willing to go for a Pap test, and if they were willing to pay for it. Other risk and behavior variables were age, number of sexual partners in the last 12 months, and if they knew that their partner had other partner. The responses to these questions were "yes/ no" and multiple responses (see Appendix A).

Perceived Barriers to Pap Test Screening Variables

Perceived barriers to Pap test screening were assessed with items such as if participants were willing to pay for the cost of Pap test/smear, if participants knew

suspect lesions could be detected early, knowledge about how cervical cancer can be treated, if participants used chemicals of plants for their intimate care, and if participants were willing to pay for Pap test or smear.

Perceived Benefits from Pap Test Screening Variables

Perceived benefits from Pap test screening variables included if participants knew that suspect lesions could be detected early; what participants would do in case of vaginal bleeding between periods; if participants would want that a national screening program be made available in the future. Responses were "yes/ no" and multiple responses (Ali-Risasi, et al., 2014).

Perceived Self-Efficacy to Pap Test Screening

Variables which were used to measure perceived self-efficacy to Pap test screening included if participants were willing to go for Pap test or get Pap smear; if participants used chemicals of plants for their intimate care; had ever got a Pap test; were willing to regularly consult a medical doctor for screening of cervical cancer. Responses were "yes/ no" (see Appendix A).

Perceived Social Support to Use Pap Test Variables

Variables which were used to measure perceived social support for Pap test included if the participants would want that a national screening program be made available in future; if participants had ever heard about cancer of the uterine cervix or cervical cancer; if participants had ever heard about cervical smear or test; how they heard about. The response options were "yes/no" (see Appendix A).

Cues to Action Variables

Variables which were used to measure cues to action included if participants had heard about Pap test; knew what a Pap test/smear was for; if they had had a Pap test in the last year; if participants knew someone in their circle of acquaintances who had had cervical cancer; what would participants do in case of vaginal bleeding between periods; which disease of the female genital tract they did know. The responses to these questions were "yes/ no" and multiple responses (Ali-Risasi et al., 2014).

Attitude Variables

Variable which were used to measure attitude for Pap test included if participants were willing to regularly consult a medical doctor for screening of cervical cancer; if participants were willing to get a Pap test/smear; if participants were willing to pay for a Pap test/smear; if participants would want a national screening program be made available in the future (Ali-Risasi, et al., 2014).

Religious Beliefs Variables

Variable which were used to measure religious beliefs included if participants' religious affiliations had an association with knowledge, attitude, and practice of cervical cancer screening.

Data Collection

Data Collection Sites

Data were collected from one of Schools that returned the letters of cooperation in Accra, Ghana where the study samples were recruited. I met with the headmaster/Principal and the teachers regarding the study. The purpose of the study was

explained. I obtained the names and/or contact information of headmasters/principals and teachers in each school. The distance between the schools and the city/towns where the participants lived were obtained. In all, seven high schools were visited whose heads or authorities agreed for the studies to be done in their respective Institutions. Letters of cooperation were sent to the schools and only two schools who returned the letters of cooperation were included in the study. However, the data were collected from only one School because I had more than the minimum sample size proposed in chapter 3.

Questionnaire Administration

This study was conducted using a sample selected from the contacted high school in Accra metropolis, Ghana who returned the letter of cooperation. A confidential self-administered questionnaire was given to participating girls who voluntary agreed to participate after they returned signed parental consent forms. I gave the self-administer questionnaire to the participants in their classrooms after school hours to prevent loss of instructional hours. The questionnaire was organized in four different sections including demographic characteristics; knowledge, attitude, and practice of cervical cancer preventions and treatments (see Appendix A). Data collected were used to evaluate the participant's experience. This enabled the researcher to uncover an ample amount of relevant information about their cervical cancer screening. The data collected have provided the researcher with an inclusive awareness of the adolescent girls in Ghana's experiences as well as insight into their reproductive health. Closed-ended questions were used, which are helpful to exploratory research (Arhinful et al., 1996). However, some open-ended questions were also included in the study. It was assumed that the open-

ended questions would gain in-depth understanding of participants' attitude and behavior concerning cervical cancer preventions. Responses from the open-ended questions regarding factors that influence individual health behaviors such as knowledge, cultural, social, attitudes, and religious beliefs were compared to the expected answers and coded (see Appendix B, additional files 2). A broad range of perspectives were identified and factors that influenced Pap test-seeking were assessed, and the conditions of making actual decisions about getting a Pap test were also explored. The questionnaire took about 20 minutes to complete. Once these data were transcribed the process of analyzing the information began.

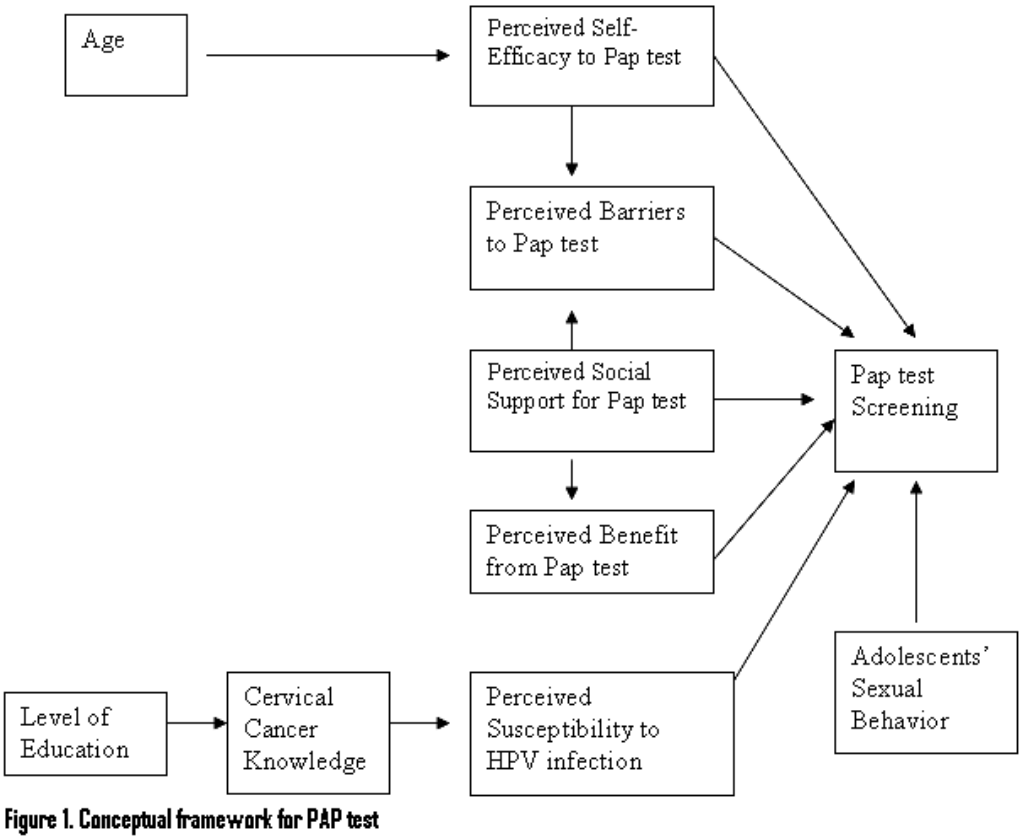

Figure 2. Conceptual framework: Pap test screening. *Note*. The conceptual framework above was modeled/Adopted from *Determinants of Condom Use to Prevent HIV* Infection Among Youth in Ghana by W. K. Adih & C. S. Alexander, 1999. *Reproduced/Adopted with permission. See Appendix D.*

Statistical Analyses

Descriptive Analyses

Thirty items on the questionnaire were used to describe demographic characteristics, knowledge, attitude, and screening practice. For each item, a participant's answer was considered correct if she gave at least one of the expected answers (see Appendix F-additional files1and 2)

Descriptive analysis included age of the participants, religion, ethnicity, and educational level. The SPSS version 24.0 for windows (SPSS, Inc.) was used for the analyses. Descriptive statistics of demographic variables and other study variables were conducted using univariate analysis to assess each variable and intent to Pap test screening. Statistical tests with alpha level of 0.05% ($p < 0.05$) level of significant was considered significant. Subsequent analyses were restricted to variables characterized as knowledge, attitude, and beliefs.

Bivariate analyses were used to examine the association of factors with intent to screen. Chi-square statistic was used to determine the significance of association between culture, religious beliefs and the intentions to seek Pap test screening. Other researchers (Ali-Risasi et al., 2014; Adih & Alexander, 1999) have used similar methods in their studies. Research has shown that programs vary in their complexity and sophistication, but their common purpose is to aid researchers to organize, manage, and code data in a more efficient way. Below explains how each research question was analyzed, coded, which is an independent variable and which is dependent variable, and statistical test used.

Research Questions and Hypotheses

Research Question 1. What do adolescent girls in Accra, Ghana know about Pap test screening?

Null Hypothesis 1*:* Adolescent girls in Accra, Ghana have knowledge about Pap test screening.

Alternate Hypothesis 1: Adolescent girls in Accra, Ghana have no knowledge about Pap test screening

The independent variable is knowledge about Pap test and the subsequent questions was focused on independent variables and dependent variables (Intent to screen or no intention to screen). Statistical tests with alpha level of 0.05% ($p < 0.05$) were considered significant.

Intent for Pap Test Screening or Nonintent for Screening by the Participants

Bivariate analyses and chi-test were used to find those who had intention to get screened and those who had no intention to get screened. Outcome (or dependent) variable was the intent to get Pap test. The response category was "yes/no" (coded as 1/0).

Association Between Cervical Cancer Risk Factors and Pap Test

For all questions, the intent to screen or not to screen were the outcome (or dependent) and responds categories for cervical cancer risk knowledge variable were "yes/no" (coded as 1/0). Independent variables for cervical cancer risk factors were number of partners, age; ever got a Pap test "yes/no". Bivariate analyses were used to find the association and Chi-square test to find the statistical significance for all research questions. Bivariate analysis was used to determine which variables such as age of the participants, number of sexual partners, education level, ethnicity, and religious affiliation was the important factor in predicting the outcome.

Research Question 2. Does knowledge about cervical cancer affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 2: Knowledge about cervical cancer does affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 2: Knowledge about cervical does not affect intent to Pap test screening among adolescent girls in Accra, Ghana.

Association Between Attitudes and Pap Test

Outcome (or dependent) variable was the intention to get screened for cervical cancer. The level of measurement or responds categories were "yes/no" (coded as 1/0). Independent variable for cervical cancer risk factors included age; number of sexual partners in a year with responds "yes/no"; willingness to pay for a pap test or smear "yes/no"; would want that a national screening program be made available in the future "yes/no"; willingness to get a smear test "yes/no"; willingness to regularly consult a medical doctor for screening of cervical cancer "yes/no"; what to do in case of vaginal bleeding between periods with multiple responses (see Appendix B-additional files 2). Bivariate analyses were used to find the relationship.

Research Question 3. Do attitudes affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 3: Attitudes do not affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 3: Attitudes do affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Association Between Culture and Intent to Receive Pap Test

Dependent variable was the intent to receive Pap test screening and association of socio-demographic characteristics of participants no intention to seek Pap test screening due to their cultural practices. Independent variable for culture was if cultural practices prevented participants from getting Pap test. Bivariate analysis was used to determine statistical significance.

Research Question 4. Does culture affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 4: Culture does affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 4: Culture does not affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Association Between Religious Belief and Intent to Pap Test Screening

The outcome (or dependent) variable was the intent to receive Pap test screening. Independent variable was if religious beliefs prevented participants from getting Pap test and the responses were "yes/no" and coded as 1/0. Bivariate analyses were used to find the association between the outcomes and chi-square was used to determine statistical significance.

Research Question 5. Do Religious beliefs affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 5: Religious beliefs do not affect to intent Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 5: Religious beliefs do affect intent to Pap test screening among adolescent girls in Accra, Ghana.

Protection of Human Participants

Consent Process

Each participant was given an information sheet that included detailed information about the study and their participation. This included the study purpose and the potential benefits or the social impacts the results of the study could provide. There was no identifiable personal information on either the consent forms or the questionnaire, so the participants did not have to sign. Parental approval was obtained before participants were allowed to decide to participate in the study. The participants were also informed that participation in the study was voluntary; they could leave the study at any time and refuse to answer any question they did not want to answer. Participants were also informed that there were no incentives, either in cash or in kind, for participation in this study.

Ethical Protection of Participants

The participants in this study were adolescent girls who were free to choose whether or not to participate. Participants were 16 to 20 years of age and voluntarily agreed to participate in study after obtaining parental consent. Participants were not linked to their parental consent form to protect their confidentiality. Authorization was sought and credits given to authors whose tools and/or documentation were used in this study. Files, computers, and transcripts are stored in a locked cabinet in my home office. Only I have access to the transcripts. There was no identifiable personal information on

either the student consent forms or the questionnaire. Clearance from IRB at Walden University was obtained for the study with the approval number 05-24-17-0078165.

Reliability and Validity

Reliability

Although this study was adopted or modified from a study in Kinshasa, the Democratic Republic of Congo (Ali-Risasi et al., 2014), questions measuring receipts of Pap test from different people, but similar age group with the similar concept can be reliable. Each completed questionnaire was reviewed. The researcher then made note of common expressions and then code them according to perception and similarity of responses to open-ended questions. Every effort was made to ensure that coded data were consistent and exact words and descriptions were presented. Similar process has been used in coding process (Schilling, 2006). Using these systems can help lead to internal consistency and make the study reliable.

Validity

The confidentiality nature of the questionnaire helped the participants to freely express themselves to answer questions which could help to prevent or decrease responds biases. The validity of the results is more reliant on the honesty of the respondents.

Summary and Transition

The methodology, materials used, ethical approach, how and where the study was conducted, and analyses have been discussed in this chapter. I have discussed and presented the actual study results in detail in Chapter 4 below.

Chapter 4: Results

Introduction

The purpose of this study was to (a) examine whether inner-city adolescent girls in Accra, Ghana had intentions to seek Pap test screening and (b) determine how knowledge, culture, attitude, and religious belief affected their intentions to seek Pap test screening. The IRB at Walden University approved this study as protocol number 05-24-17-0078165 before the data collection commenced. In Chapter 3, I presented the method of the study. In this chapter, I present the data collection, the period for data collection, data management, data reviews, data analysis, the study results, and summary. The research questions and associated hypotheses that guided this study were as follows:

Research Question 1. What do adolescent girls in Accra, Ghana know about Pap test screening?

Null Hypothesis 1*:* Adolescent girls in Accra, Ghana have knowledge about Pap test screening.

Alternate Hypothesis 1: Adolescent girls in Accra, Ghana have no knowledge about Pap test screening

Research Question 2. Does knowledge about cervical cancer affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 2: Knowledge about cervical cancer does affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 2: Knowledge about cervical does not affect intent to Pap test screening among adolescent girls in Accra, Ghana.

Research Question 3. Do attitudes affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 3: Attitudes do not affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 3: Attitudes do affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Research Question 4. Does culture affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 4: Culture does affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 4: Culture does not affect intent to Pap test screening status among adolescent girls in Accra, Ghana.

Research Question 5. Do Religious beliefs affect intent to Pap test screening among adolescent girls in Accra, Ghana?

Null Hypothesis 5: Religious beliefs do not affect to intent Pap test screening status among adolescent girls in Accra, Ghana.

Alternate Hypothesis 5: Religious beliefs do affect intent to Pap test screening among adolescent girls in Accra, Ghana.

Data Collection

Approach

Obtaining parental consent forms for data collection went from June 2017 to July 2017. The proposed sample size was 100 participants. However, 155 adolescents

participated in the actual study. Data for the study were obtained from the primary source. I used a paper-structured questionnaire to collect data. Data were collected from one of the High schools in Accra, Ghana that submitted the letter of cooperation before the IRB approval. I first met with the director of the school to inform him of the study, and a date was set to meet with the students to announce my arrival and restate the purpose of the study. I met with the students to arrange a date with the participants regarding the study. The participants were adolescent high school girls in Accra, Ghana. I selected the target population of the study by a convenience sampling of adolescent girls attending high schools in the Accra metropolitan area. The participants were high school adolescent girls between 16 and 20 years old at the time of the study. Most of the participants lived within 5 miles away from the school. In the Chapter 3, I proposed a minimum sample size of 100. I found that more than 100 participants could be recruited from one of the two high schools so I contacted the headmistress of the second school and informed her that there would be no need to recruit participants from her high school. I expressed my gratitude to the head mistress for her willingness to offer her school to participate in the study.

Questionnaire Administration

The consent forms were given to the participants who were 18 years of age and older, and the assent forms were given to the participants who were 16 years and 17 years old. The consent and assent forms had information about their participations, the study procedure, the purpose of the study, potential risks and benefits, and positive social impacts the results of the study could provide. There was no identifiable personal

information on either the consent forms or the questionnaire, so the participants did not have to sign the consent and assent forms to obtain parental consent. I provided the parental consent forms to the participants to be given to their parents for their approval. One of the classrooms was designated for the research, so the participants were informed of the room where I was available to collect the signed parental consent forms. Students sent the signed parental consent forms directly to me.

After I received parental consent forms directly from the students, I distributed consent and assent forms to the participants for their voluntary participations. I met the participants in the designated room for the survey in the afternoons after regular school hours to ensure that the students did not lose their official academic school hours. Students who agreed to participate in the study answered a paper and pen semi-structured questionnaire based on studies by Ali-Risasi et al. (2014) whose original study was performed in Kinshasa, the Democratic Republic of Congo with the participants aged from 16 to 64 years old. The questionnaire was organized in two different sections as follows: (a) sociodemographic characteristics/information and (b) Pap test/Pap smear and cervical cancer. Section 2 was also sectioned into three parts: (a) knowledge (b) attitude, and (c) practice (see Appendix A), which included information about sexual and reproductive activities, frequencies of the Pap test/smear, knowledge about the objective of the Pap test/smear, understanding of the importance of its regular or periodic testing, knowledge about cervical cancer, and causes of cervical cancer, preventions, and treatments. There were total of 30 items on the questionnaire, and it took between 15 to 25 minutes for the completion of the questionnaires. I administered the questionnaires in

four different batches. The first two batches were administered in one day to the participants who were between 18 years to 20 years old. The remaining two batches were administered to those 16 and 17 years old. The questionnaire was a confidential self-administered survey. Participants voluntary agreed to participate in the study after they had returned signed parental consent and assent forms from those who were 16 and 17 years old as well as consent forms from the students who were 18 to 20 years old. I gave the paper and pen self-administered questionnaire to the participants in the designated classroom after school hours to prevent the loss of instructional hours. Before the start of the survey, I presented literature about HPV and cervical cancer to the participants, explained the purpose of the study, and gave them the opportunity to ask questions. I went over any questions posed by the participants for clarification. If a participant had a question or wanted to get clarification of the items on the survey, I took the time to explain the items to the participants. The survey was conducted in batches to avoid over cloudiness. I told the participants that participation in the study was voluntary, and there were no incentives either in kind or in cash to participate in the study. I also informed the participants that they could stop participating in the study at any time if they so choose and if they felt uncomfortable. The questionnaire took an average of 20 minutes to complete taking into considerations of the questions asked by some of the participants. I collected the completed questionnaires, placed them in the envelope, and locked them in my brief case for safe-keeping until I returned to my home office in the United States.

Data Management

There were 30 items on the questionnaire, which were used to describe demographic characteristics, knowledge, attitude, Pap test/smear screening practices of the participants, and health belief variables. For each item, a participant's answer was considered correct if she gave at least one of the expected answers (see Appendix B, additional files 2) and were coded as "1 or 0," which gave the participants one to three points. I used Microsoft Excel for the management and later transferred the data to IBM SPSS 24.0 for statistical analyses.

I reviewed the data collected from the survey and cross-checked to ensure consistencies in the responses and the information provided by the participants were subsequently coded into the computer. I manually entered data collected into my computer for initial management using Microsoft Excel and later transferred the data to IBM SPSS 24.0 for analyses.

Results

The sociodemographic, knowledge, attitude, and practices were assessed in terms of their associations with Pap test knowledge, Pap test knowledge about risk factors and the constructs of the health belief model (perceived risk of cervical cancer, perceived susceptibility, perceived barriers, perceived benefits, cues to action, perceived self-efficacy, and perceived social support). In addition, bivariate analyses were conducted to obtain statistical analyses to determine associations between the variables and the intent to Pap test screening. Logistic regression analyses were performed to test the hypotheses for research questions 1, 2, and 3 using a *t*-test for knowledge, attitude, and intentions to

screen with the Pap test. Chi-square was performed to determine statistical significance in testing the hypotheses for research questions 4 and 5. Statistical significance was determined if $p < 0.05$ and the null hypotheses were rejected if significance was reached.

Univariate Frequency Distributions

Demographic characteristics. A total of 155 adolescent girls ages 16 to 20 years participated in the study. The mean age was 17.4 years and the majority (64.5%) were 16 to 17 years old, while 35.5% were 18 to 20 years old (see Table 5). More than one third (38.1%) were from the Akan tribe, 29.0% were from the Ewe tribe, 14.8% were from the Ga tribe, and 18.1% were from other ethnic back grounds. The majority (79.3%) were Christians, 10.0% were Muslim, and 10.7% other religions. Similarly, participants' parents were 79.9% Christians, 10.7% Muslims, and 9.4% had other religious beliefs. Almost half (49.0%) of the participants lived in the Accra area, 21.3% lived in Medina, 9.0% lived in Adenta, and 20.6% lived in other areas. Almost all the participants (98.6%) were single and did not have children (96.1%). All six participants who had children, had only one child (see Table 5).

Table 5

Sociodemographic Characteristics of Participants

Variables	*n*	Frequency	Percent
Age (years)	(155)		
• 16		33	21.3
• 17		67	43.2
• 18		29	18.7
• 19		17	11.0
• 20		9	5.8
• 16-17		100	64.5
• 18-20		55	55.5
Education Level	(155)		
• 10^{th} grade		33	21.3
• 11^{th}-12^{th} grade		122	78.8
Ethnicity/Culture/Tribe	(155)		
• Akan		59	38.1
• Ewe		45	29.0
• Ga		23	14.8
• Other		28	18.1
Religious affiliations: What is your Religion?	(150)		
• Christian			79.3
• Islam/Muslim			10.0
• Other			10.7
Religious affiliations: Parents/Guardians	(149)		
• Christian		119	79.9
• Islam/Muslim		16	10.7
• Other		14	9.4
Marital Status	(155)		
• Single		152	98.1
• Married		0	0
• Divorced		2	1.3
• Widowed		1	0.6
Parity: Do you have children?	(155)		
• Yes		6	3.9
• No		149	96.1
If you have children, how many?	(6)		
• One		6	100.0
• Two or more		0	0.0

Table 6 below shows the ethnicity of the respondents who reported that their religious beliefs were Muslim.

Table 6

Ethnicity of the adolescents whose religion is Islam

Ethnic Group	Frequency n=15	Percent
Dagomba/Mamprusi/Housa/Fulani/Gus/Badanda	11	73.3
• Other	2	13.3
• Ewe	1	1.7
• Akin	1	1.7

Knowledge of Pap test and cervical cancer. The majority (70.9%) of the participants had knowledge about various female genital tract diseases and 29.1% provided different responses (see Table 7). Over half (58.1%) had not previously heard about cervical cancer or cancer of the uterine cervix. Of the respondents who had heard about cervical cancer (n=65), 35.6% stated they heard about it through one of the expected media outlets such as oral communication, television, radio, church, and school (see Appendix B, file 2) while 64.4% provided other responses, and 88.9% did not know the causes of cervical cancer and provided varied responses as the causes of cervical cancer. Almost all participants (95.4%) did not know anyone who had cervical cancer. However, 4.6% reported that they knew someone in their close circle of acquaintances who had cervical cancer. Almost all (95.4%) did not know how cervical cancer could be treated and provided various responses. The great majority (93.7%) had no knowledge about how cervical cancer could be prevented. Ninety-two percent had not heard about

cervical cancer, 86.2% did not know that suspect lesions can be detected early, and only 13.8% had knowledge that suspect lesions can be detected early.

Table 7

Knowledge of Pap test and cervical cancer

Knowledge Questions	***n***	**Frequency**	**Percent**
Which disease of the female genital tract do you know?	141		
• Correct-expected answer		100	70.9
• Other responses		41	29.1
Have you ever heard about cervical cancer or cancer of the uterine cervix?	155		
• Yes		65	41.9
• No		90	58.1
If you have ever heard about cervical cancer, how did you hear about it?	132		
• Correct-expected answers		47	35.6
• Other responses		85	64.4
What are the causes of cervical cancer?	135		
• Correct-expected answers		15	11.1
• Other responses		120	88.9
In your close circle of acquaintances, do you know someone who has had cervical cancer?	152		
• Yes		7	4.6
• No		145	95.4
How can cervical cancer be treated?	130		
• Correct/expected answers		6	4.6
• Other responses		124	95.4
How can cervical cancer be prevented?	127		
• Correct/expected answers		8	6.3
• Other responses		119	93.7
Have you ever heard about cervical smear?	150		
• Yes		12	8.0
• No		138	92.0
Do you know that suspect lesions can be detected early?	138		
• Yes			13.8
• No			86.2

Attitudes about Pap test screening. More than half (61.3%) of participants had intention to seek medical services in case of vaginal bleeding between periods and over a third (38.7%) provided varied responses, over three-fourths (88.7%) were willing to regularly consult a medical doctor for screening of cervical cancer and only 11.3% were not willing to regularly consult a medical doctor for screening of cervical cancer (see Table 8). The majority of adolescent girls (81.5%) were willing to get Pap test screening, 18.5% were not willing to get Pap test screening, and 96.0% wanted a national screening program to be available in the future while 4.0% did not. Over half (57.4%) were willing to pay for Pap test screening while 42.6% were not willing to do so.

Table 8

Attitudes about Pap Test and Cervical Cancer Screening

Attitudes Questions	***n***	**Frequency**	**Percent**
What would you do in case of vaginal bleeding between periods?	137		
• Correct/expected answer		84	61.3
• Other responses		53	38.7
Are you willing to regularly consult a medical doctor for screening of cervical cancer?	150		
• Yes		132	88.7
• No		18	11.3
Are you willing to get a Pap test or smear test?	151		
• Yes		123	81.5
• No		28	18.5
Would you want that a national screening program be made available in the future?	149		
• Yes		143	96.0
• No		6	4.0
Are you willing to pay for a Pap test?	148		
• Yes		85	57.4
• No		63	42.6

Table 9 below shows various responses to the first question in Table 8 above: *What would you do in case of vaginal bleeding between periods?* Almost half (47.2%) would inform their parents and about a third (32.1%) had no idea what to do.

Table 9

What participants would you do in case of vaginal bleeding between periods

Other Specified Responses to Q. 1	***n* (53)**	**Frequency**	**Percent**
Inform my parents/tell my mom		25	47.2
I don't know/no idea		17	32.1
Keep to myself/ prevent my self		3	5.7
Put on Pan/change pad regularly		6	11.3
Treat my self		1	1.9
Take medications		1	1.9

Pap test and cervical cancer practice. Almost all participants (98.6%) had a gynecological examination in the prior 2 years (see Table 10). Participants were not likely to use any chemical for plant products for their intimate care (92.2%). Only 7.8% reported that they used chemicals for plants for their intimate care. None of the participants had ever smoked cigarette (100.0%) and 96.5% had one or no sexual partner in the last year; however, 92.9% stated that their partner did not have another partner besides them and 8.1% did not know if their sexual partners had a partner beside them. Practice of Pap test screening was very low with only 1.3% ever having a Pap test done.

Table 10

Pap Test and Cervical Cancer Practice

Pap Test and Risk Practice Questions	*n*	Frequency	Percent
When was your last gynecological examination?	144		
• Less than 2 years		2	1.4
• I have not done gynecological examination		142	98.6
Do you use chemicals of plants for your intimate care?	142		
• Yes		11	7.8
• No		131	92.2
Do you smoke?	155		
• Yes		0	0.0
• No		155	100.0
How many sexual partners have you had in the last year?	144		
• One or none		139	96.5
• Two ro more		5	3.5
Does your partner have a partner beside you?	136		
• Yes		0	
• No-expected answer		125	91.9
• I don't know		11	8.1
Have you ever got a Pap smear test?	150		
• Yes		2	1.3
• No		148	98.7

Culture and intent to screen. Cultural/Ethnicity and intent to screen results showed that, 38.1% of the participants were Akans, 29.0% were Ewe, 14.8%, and those with other ethnic backgrounds were 18.1%. Among those with Akan ethnic background, 55.9% had intention to screen and 44.1% did not have intention to screen in future. Among those with Ewe background, 62.2% had intention to screen in the future while 37.8% did not have intention to screen in future. Among those with Ga background 34.8% of the respondents had intention to screen in future while 65.2% did not have intention to screen in future. Among those with other ethnic backgrounds, 35.7% had

intention to screen while 64.3% had no intention to screen. In all, 49.0% of the participants had intention to screen while 51.0% had no intention to screen.

Table 11

Ethnicity/Culture and Intent to Screen Score

Ethnicity/Tribes	***n***	**Frequency**	**Percent**
Akan	59		
• Yes		33	55.9
• No		26	44.1
Ewe	45		
• Yes		28	62.2
• No		17	37.8
Ga	23		
• Yes		8	34.8
• No		15	65.2
Other	28		
• Yes		10	35.7
• No		18	64.3
Total	155		
• Yes		76	49.0
• No		79	51.0

Inferential Statistical Analyses

In the bivariate analyses, the correlation between knowledge about Pap test and screening was $\rho = 0.038$ and p vale = 0.064 respectively which means that there was no statistically significant correlation between knowledge and Pap test screening (see Table 21). In addition, the participants had poor knowledge about cervical cancer, no association between cultural, religious beliefs, and intent to seek Pap test screening for cervical cancer among the respondents. The results showed statistically significant association between attitude and intent to seek Pap test screening (see Table 21). The

results have also allowed me to know about different perceptions regarding participants' intention to seek or not seek Pap test screening under varied circumstances.

The logistic regression analyses showed statistically significant associations between sexual partners and Pap test practices with $\rho = 0.222$ and p value = 0.005 respectively (see Table 21). Screening practices $\rho = 0.222$ a p value = 0.005. Higher number on practices was associated with lower number of sexual partners. Higher scores on practices were associated with lower number of sexual partners. Statistical analyses showed statistically significant association between respondents' attitude and intent to screen for cervical cancer with $\rho = 0.648$ and p vale = 0.001 respectively (see Table 21). The Chi-Square test for cultural/ethnicity showed no statistical significance with p value of 0.049 and the Chi-Square test for religious belief showed a statistical significance with a p value of 0.529 (see Table 21) as such shows a moderate evidence against the null hypotheses as such the null cannot be rejected. This therefore means that cultural practices/beliefs among the Ghanaian high school female students do not affect their intentions to seek Pap test screening.

Statistical analyses to test the *research question 1* showed no significant association between knowledge and Pap test screening with Pearson correlation (ρ) of 0.038 and p value of 0.064 (see Table 21). Statistical analyses regarding *research question 2* showed a statistical significant association about knowledge, cervical cancer, and the participants intent to Pap test screening with $\rho = 0.017$ and p value = 0.032 respectively (see Table 21). Statistical analyses regarding *research question 3* showed statistically significant association between attitude and intent to Pap test screen with $\rho =$

0.648 and *p* value= 0.001 (see Table 21). Chi-square test regarding research question 4 showed no statistical significant association between culture and intent to Pap test screen with *p* vale of 0.049 (see Table 21). Chi-square test regarding research question 5 showed no statistical significant association between religious belief and intent to Pap test screening with *p* value of 0.529 (see Table 23). Details of the results are presented in the tables and discussed below:

Knowledge of Pap Test and Cervical Cancer

Among the adolescents surveyed, majority (70.9%) had knowledge about various female genital tract diseases and 29.1% provided different responses (see Table 6). Majority (58.1%) reported that they had not previously heard about cervical cancer or cancer of the uterine cervix and 41.9% reported that they had heard about cervical cancer. Of the respondents who had heard about cervical cancer, 35.6%stated they heard about it through one of the expected answers such as oral communication, television, radio, church, and school (see Appendix B, file 2) while 64.4% provided other various responses. Few (11.1%) of the respondents had knowledge about the causes of cervical cancer and 88.9% did not know the causes of cervical cancer and provided varied responses as the causes of cervical cancer. Majority (95.4%) stated that they did not know anyone who had cervical cancer. However, 4.6% reported that they knew someone in their close circle of acquaintances who had had cervical cancer.

With regard to how cervical cancer can be treated, majority (95.4%) reported that they did not know how cervical cancer could be treated and provided various responses. Only (4.6%) had knowledge about how cervical cancer could be treated and provided correct/expected answer about its treatment. Concerning how cervical cancer could be prevented, majority of (93.7%) had no knowledge about it. Only (6.3%) had knowledge about cervical cancer prevention. Among the respondents, majority (92.0%) stated that they had not heard about cervical cancer and only 8% stated that they had heard about cervical cancer,86.2% did not know that suspect lesions can be detected early, and only

13.8% had knowledge that suspect lesions can be detected early. Table 7 was presented earlier and shows Pap test and cervical cancer knowledge among the participants.

Attitude About Pap Test and Cervical Cancer Screening

From the Table 8 below concerning the attitude regarding Pap test screening or cervical cancer prevention among the participants, most (61.3%) participants reported that they would seek medical services in case of vaginal bleeding between periods whilst 38. 7% respondents provided varied insights into what they would do (see Table 9). The majority (88.7%) stated that they were willing to regularly consult a medical doctor for screening of cervical cancer and only 11.3% were not willing to regularly consult a medical doctor for screening of cervical cancer. Among the respondents, again majority (81.5%) stated that they were willing to get Pap test screening and 18.5% stated that they were not willing to get Pap test screening. In addition, majority (96.0%) of the participants stated that they would want a national screening national program to be available in the future and only 4.0% did not want that a national screening program be made available. Again most (57.4%) reported that they were willing to pay for a Pap test screening and 42.6% stated that they were not willing to pay for a Pap test screening (see Table 8).

With regards to what would the participants do in case of vaginal bleeding between periods, 53 (38.7%) of 137 respondents had various responses which were not among the expected answers (see Table 9; Appendix A; and Appendix B, additional files 2). Of the 53 respondents who provided various responses, 47.2% stated that they would inform their parents or mothers in case of vaginal bleeding between periods. Another

32.1% stated that they did not know or had no idea,5.7% stated that they would keep to themselves or prevent themselves, 11.3% stated that they would put on pad or change pad regularly,1.9% stated that she would treat herself, and the other 1.9% stated that she would take medications (see Table 9). In all, there was statistically significant association between respondents' attitude and intent to screen for cervical cancer with $\rho = 0.648$ and p value = 0.001 respectively (see Table 21).

Table 8 below shows responses to questions regarding attitude about Pap test and cervical cancer screening among the respondents.

Pap Test and Cervical Cancer Practice

Table 10 below shows that among the participants, the majority (98.6%) had never had gynecological examination; only 1.4% had gynecological examination in less than 2 years. Most (92.2%) did not use chemicals of plants for their intimate care and only 7.8% reported that they used chemicals of plants for their intimate care. None of the participants (100%) smoked and 93.6% had one or no sexual partner in the last year. Only 3.5% had two or more sexual partners in the last year. Among the participants, majority (92.9%) stated that their sexual partners did not have a partner beside them and 8.1% stated that they did not know if their partners had a partner beside them. Majority (98.7%) never got a Pap test and only 1.3% ever had Pap test done (see Table 10).

The Logistics regression analyses showed statistically significant associations between sexual partners and Pap test practices with $\rho = 0.222$ and p value = 0.005 respectively (see Table 21). Higher score on practices was associated with lower number

of sexual partners. Table 10 below shows Pap test and cervical cancer practices among the respondents.

Pap Test Knowledge

From the figures in Table 12 the majority (70.9%) of the adolescents surveyed had knowledge concerning diseases of the female genital track while 29.1% did not know and provided various responses. Over fifty eight (58.1%) of the adolescents stated that they had never heard about cervical cancer and 41.94% stated that they had heard about cervical cancer, 35.6% stated that they heard about cervical cancer through radio, television, oral communication, church, school, and 64.4%provided various responses. The majority (92.0%) reported that they had never heard about Pap test screening and only 8.0% stated that they had ever heard about Pap test screening. Additionally, 86.2% of the adolescents stated that they did not know that suspect lesions can be treated early and only 13.8% stated they knew that suspect lesions can be treated early. Majority of the adolescents (98.7%) had not had Pap test done and only1.3% had Pap test done. The majority (81.5%) of the adolescents stated that they were willing to seek Pap test while and only 18.5% stated that they were not willing to seek Pap test (see Table 12). Logistic regression analyses showed no association between knowledge about Pap test screening with coefficient (ρ) = 0.038 and p value = 0.0638 (see Table 21).

Table 12

Pap test knowledge

Variables (Questions)	*n*	Frequency	Percent
Which disease of the female genital tract do you know?	141		
• Correct/Expected answers		100	70.9
• Other responses		41	29.1
Have you ever heard about cervical cancer or cancer of the uterine cervix?	155		
• Yes		65	41.9
• No		90	58.1
If you have ever heard about cervical cancer, how did you hear about it?	32		
• Correct/Expected answers		47	35.6
• Other responses		85	64.4
Have you ever heard about cervical smear?	150		
• Yes		12	8.0
• No		138	92.0
Do you know that lesions can be treated early?	138		
• Yes		19	13.8
• No		119	86.2
Have you ever got a Pap smear?	150		
• Yes		2	1.3
• No		148	98.7
Are you willing to get a Pap test or smear test?	151		
• Yes		123	81.5
• No		28	18.5

Pap Test Knowledge About Risk Factors

To access the Pap test knowledge about the risk factors in Table 13 above, the majority of the adolescent, (70.9%) showed that they had adequate knowledge about the disease of female genital tract while 29.1% had no knowledge of the female genital tract disease and provided various different answers. Among the respondents, 41.9% stated that they had heard about cervical cancer while 58.1% stated that they had not heard

about cervical cancer. Among those who had heard about cervical cancer, 35.6% stated that they heard about cervical cancer through one of the expected answers such as oral communication, radio, television, church, and school while the majority (64.4%) provided various responses. All of the adolescent respondents stated that they did not smoke, 88.9% did not know the causes of cervical cancer, and only a few, 11.1% knew at least one cause of cervical cancer. Majority (95.4%) did not know how cervical cancer can be treated and only 4.6% knew how cervical cancer can be treated. Again, 93.7% did not know how cervical cancer can be prevented, 6.3% knew how cervical cancer can be prevented, 86.2% did not know that suspect lesions can be detected early, and 13.8%knew that suspect lesions can be treated early. Table 13 below shows the results for the Pap test knowledge about risk factors among the respondents.

Table 13

Pap test knowledge about risk factors

Variables (Questions)	*n*	Frequency	Percent
Which disease of the female genital tract do you know?	141		
• Expected answers		100	70.9
• Other responses		41	29.1
Have you ever heard about cervical or cancer of the uterine cervix?	155		
• Yes-Expected answers		65	41.9
• No		90	58.1
If you have ever heard about cervical, how did you hear about it?	132		
• Correct/expected answers		47	35.6
• Other responses		85	64.4
Do you smoke?	155		
• Yes		0	0.0
• No		155	100.0
What are the causes of cervical cancer?	135		
• Expected answers		15	11.1
• Other responses		120	88.9
How can cervical cancer be treated?	130		
• Expected answers		6	4.6
• Other responses		124	95.4
How can cervical cancer be treated?	127		
• Expected answers		8	6.3
• Other responses		119	93.7
Do you know that suspect lesion can be detected early?	138		
• Yes-Expected answer		19	13.8
• No		119	86.2

Cervical Cancer Risk Knowledge

The results on the cervical cancer risk knowledge in the Table 14 below indicated that the majority of the adolescent (96.5%) had one or no sexual partner in the last year while only 3.5% stated that they had two or more sexual partners. Majority of the

adolescent, 85.6% did not know if their partners had another partner beside them and few 14.4% stated that they had not heard about, all of the adolescent participants stated that they did not smoke. Also, 41.9% had ever heard about cancer of the uterine cervix while 58.1% stated that they had ever heard about cancer of the uterine cervix. Regarding if the adolescents had ever heard about cervical, and how they heard about it, 35.6% of the adolescents provided the expected answers including through oral communication, radio, television church, and school, and 64.4% provided different answers.

Almost 94% (93.7%) did not know how cervical cancer can be prevented while only 6.7% knew how it can be prevented. In addition, 95.4% did not know anyone in their circle of acquaintance who has had cervical cancer while only 4.6% reported that they knew some in their close circle who had had cervical cancer. Results for responses by the participants regarding cervical cancer risk knowledge are shown in Table 13 below:

Table 14

Cervical cancer risk knowledge

Variables (Questions)	***n***	**Frequency**	**Percent**
How many sexual partners have you had in the last year?	144		
• One/none-Expected answer		139	96.5
• Two/more		5	3.5
Does your partner have a partner beside you?	146		
• Yes		0	
• No-Expected answer		125	85.6
• I don't know		21	14.4
Do you smoke?	155		
• Yes		0	0.0
• No-Expected answer		155	100.0
Have you ever heard about cancer of the uterine cervix?	155		
• Yes		65	41.9
• No		90	58.1
If you have ever heard about cervical cancer, how did you hear about it?	132		
• Expected answers (Multiple answers)		47	35.6
• Other responses		85	64.4
How can cervical cancer be prevented?	127		
• Expected answers		8	6.3
• Other responses		119	93.7
In your close circle of acquaintances, do you know someone who has had cervical cancer?	152		
• Yes		7	4.6
• No		145	95.4

The Health Belief Model/Theoretical Framework

Perceived Susceptibility to Cervical Cancer

In terms of how the participants perceived themselves to be susceptible to cervical cancer, regarding what to do in case of vaginal bleeding between periods, 61.3% of the participants perceived themselves to be at risk and would consult a medical doctor or go to a health center while 38.7% provided varied responses as to what they would do.

Majority (88.7%) of the participants were willing to regularly consult a medical doctor for screening for cervical cancer and only 11.3%indicated that they were not willing regularly to consult a medical doctor for screening of cervical cancer. Majority of the participants (81.5%) of the participants stated that they were willing to get Pap test done and 18.5% stated that they were not willing to get Pap test done. Regarding the participants' willingness to pay for a Pap test, 57.4% indicated that they were willing to pay for it and 42.6% stated that they were not willing to pay for the Pap test screening. Regarding Pap test practice, the majority, (98.7%) of the stated that they had never got a Pap test and only 1.3% stated that they had ever got a Pap test (see Table14). Among participants who had ever got a Pap test, both of them were 20 years old and one of them had given birth with one child.

Among the participants, the majority (96.5%) reported that they had one partner or never had a partner before in their lifetime while 3.5% reported that they had two or more sexual partners in the last year, 92.9% reported that their partners did not have a partner beside them and 8.1% stated that they did not know (see Table14). Among the participant, 64.5% were between 16 to17 years old and 35.5% were between 18 to 20

years old. Two (1.33%) participants who were 20 years old had a Pap test done. Table14 below shows the results for the responses by the participants about their perceived susceptibility to cervical cancer.

Table 15

Perceived susceptibility to cervical cancer

Variables (Questions)	***n***	**Frequency**	**Percent**
What would you do in case of vaginal bleeding between periods?	137		
• Correct/expected answers		84	61.3
• Other responses		53	38.7
Are you willing to regularly consult a medical Doctor for screening of cervical cancer?	150		
• Yes		132	88.7
• No		18	11.3
Are you willing to get a Pap test or smear test?	151		
• Yes		123	81.5
• No		28	18.5
Are you willing to pay for a Pap test?	148		
• Yes		85	57.4
• No		63	42.6
Have you ever got a Pap test/smear?	150		
• Yes		2	1.3
• No		148	98.7
How many sexual partners have you had in the last year?	144		
• One/none		139	96.5
• Two/more		5	3.5
Does your partner have a partner beside you?	136		
• Yes		0	
• No		125	92.9
• I don’t know		11	8.1

Perceived Barriers to Pap Test Screening

Concerning participants' perception about barriers from seeking Pap test, the majority (57.3%) reported that they were willing to pay for a Pap text while 42.6% of the respondents stated that they were not willing to pay for a Pap test (see Table 12). A majority, 86.2% of the respondents reported that they did not know that suspect lesions can be treated early and only about fourteen percent (13.8%) knew that suspect lesions could be treated early (see Table12). Additionally, 95.4% of the adolescent respondents stated that they did not know how cervical cancer can be treated and provided various responses. Only a few, 4.6% of the respondents knew that cervical cancer can be treated and provided correct/expected answers. The majority, 92.3% also stated that they did not use chemical of plants for their intimate care while 7.8% stated that they used chemicals of plants for their intimate care. Table 16 below shows the responses regarding the perceived barriers to Pap test screening among the respondents.

Table 16

Perceived barriers to Pap test screening

Variable (Questions)	*n*	Frequency	Percent
Are you willing to pay for a Pap smear test?	148		
• Yes		85	57.4
• No		63	42.6
Do you know that suspect lesions can be detected early?	138		
• Yes		19	13.8
• No		119	86.2
How can cervical cancer be treated?	130		
• Corrected/expected answer		6	4.6
• Other responses		124	95.4
Do you use chemicals of plants for your intimate care?	142		
• Yes		11	7.8
• No/expected answer		131	92.2
Have you ever heard about cervical smear?	150		
• Yes		12	8.0
• No		138	92.0

Perceived Benefits From Pap Test Screening

The majority (61.1%) of the adolescent respondents indicated that they would consult a medical doctor or go to a health center in case of vaginal bleeding between periods while 38.7% provided different responses. Majority of the participants, 86.2% did not know that suspect lesions can be treated early expect for only 13.8% of the participants who knew that suspect lesions could be treated early. Also, 96.0% reported that they would want a national screening program to be available in the future while only 4.0% stated that they would not want a national screening program to be made available in the near future. Table 17 below shows the results regarding perceived benefits from Pap test screening among the respondents.

Table 17

Perceived benefits from Pap test screening

Variables (Questions)	*n*	Frequency	Percent
What would you do in case of vaginal bleeding between periods?	137		
• Knowledge-expected answers		84	61.3
• Other answers/multiple responses		53	38.7
Do you know that suspect lesions can be detected early?	138		
• Yes		19	13.8
• No		119	86.2
Would you want that a screening of national program be made available in the near future?	149		
• Yes		143	96.0
• No		6	4.0

Perceived Self-Efficacy to Pap Test Screening

With regard to self-efficacy, the majority (81.5%) of the adolescent respondents stated that they were willing to get a Pap test while 18.5% stated that they were not willing to get a Pap screening done. Few (7.8%) of the participants reported that they used chemical of plants for their intimate care while the 92.2% reported that they did not use chemicals of plants for their intimate care. Majority (88.7%) of the adolescent participants stated that they were willing to regularly consult a medical doctor for screening of cervical cancer while only few (11.3%) stated that they were not willing to regularly consult a medical doctor for screening of cervical cancer. Table 18 below shows perceived self-efficacy to Pap test screening among the respondents.

Table 18

Perceived Self-efficacy to Pap test screening

Variables (Questions)	*n*	Frequency	Percent
Are you willing to get a Pap test or smear test?	151		
• Yes-Expected answer		123	81.5
• No		28	18.5
Do you use chemicals of plants for your intimate care?	142		
• Yes		11	7.8
• No		131	92.2
Have you ever got a Pap smear?	150		
• Yes-expected answer		2	1.3
• No		148	98.7
Are you willing to regularly consult a medical Doctor for screening of cervical cancer?	150		
• Yes-expected answer		132	88.7
• No		18	11.3

Perceived Social Support to Use Pap Test

Among the adolescent participants, majority (96.0%) wanted that a national screening program be made available in the future, and only few (4.0%) did not want that a national screening program be made available in the future. Among the adolescents surveyed, 41.9% had heard about cervical cancer while 58.1% had not heard about cervical cancer. Among those who had heard about cervical cancer, 35.6% stated that they heard about cervical cancer through at least one of the expected answers such as the radio, television, church, school, and oral communication (Appendix B, Additional file 2, Table 9), and majority provided different answers regarding perceived social support. Table 19 below shows responses by the respondents about their perceived social support to use Pap test.

Table 19

Perceived Social Support to Use Pap Test

Variables (Questions)	*n*	Frequency	Percent
Would you want that a national screening program be made available in the future?	149		
• Yes		143	96.0
• No		6	4.0
Have you ever heard about cervical cancer or cancer of the uterine cervix?	155		
• Yes-Expected answer		65	41.9
• No		90	58.1
If you have ever heard about cervical cancer, how did you hear about it?	132		
• Correct/expected answer		47	35.6
• Other/multiple answers		85	64.4

Cues to Action

With regard to cues to actions, the majority, 92.0% adolescents stated that they had never heard about cervical smear while 18.0% stated that they had heard about cervical smear; all of the participants, 100% did not smoke, 41.9% had never heard about cervical cancer while the majority, 58.1 had not heard about cervical cancer. In their close circle of acquaintances, the majority of few, 4.6% knew someone who had had cervical cancer. The majority, 61.3% of the adolescent respondents stated that they would consult a medical doctor or health center in case of vaginal bleeding between periods while 38.7% of the respondents provided varied responses (see Table 20). Additionally, the majority of the adolescents had knowledge about diseases of the female genital tract while 29.1% provided different responses. Table 20 below shows the responses from the respondents about cues to action.

Table 20

Cues to Action

Variable (Questions)	*n*	Frequency	Percent
Have you ever heard about cervical cancer?	150		
• Yes		12	8.0
• No		138	92.0
Do you smoke?	155		
• Yes		0	
• No		155	100.0
Have you ever heard about cervical cancer or cancer of the uterine cervix?	155		
• Yes-Expected answer		65	41.9
• No		90	58.1
In your close circle of acquaintances, do you know someone who has had cervical cancer?	152		
• Yes-Expected		7	4.6
• No		145	95.4
What would you do in case of vaginal bleeding between periods?	137		
• Expected answer-Consult a medical Doctor/go to health center		84	61.3
• Other responses		53	38.7
Which disease of the female genital tract do you know?	141		
• Expected answers		41	29.1
• Other responses		100	70.9

Religious Beliefs

The majority (79.33%) of the participants were Christians, 10% were Islam or Muslims, and 10.7% had other believes. Similarly, 79.97% of their parents/guardians were Christians, 10.7% Islam/Muslims, and 9.4% had other believes (see Table 5). To determine association(s) of Pap test and intention to screen for cervical cancer prevention, the study found that religious beliefs did not affect the intention to get Pap

test screening (see Table 8; Table 21). Among the 150 respondents, 132 (88.7%) stated that they were willing to regularly consult a medical doctor for screening of cervical cancer. Majority 123 (81.56%) of the 151 respondents sated that they were willing to seek Pap test screening (see Table 8).

Statistical Analyses of the Research Questions

The correlation between variables and their significant levels are shown in Table 21 below and followed by the analyses of the research questions.

Table 21

Correlations between Knowledge, Attitudes, Religion, Culture and Demographics

Variables	**Pearson correlation (ρ)**	***p* value**
Knowledge about Pap test and screening	0.038	0.064
Knowledge about cervical cancer and intent to screening	0.0174	0.032
Attitude and intent to screen	0.648	0.001
Knowledge about Pap test screening and education level	0.257	0.002
Age and Education/grade level	0.303	0.000
Age and Knowledge about Pap test screening	-0.003	0.973
Age and attitude to screen	0.044	0.589
Age and sexual partners	0.205	0.010
Sexual partners and Pap test practice	0.222	0.005
Religion-Being Christian and intent to screen	0.298	0.001
Religion-Being Islam/Muslim and intent to screen	0.527	0.001
Religion-Other beliefs and intent to screen	-0.088	0.277
Religion and Culture-Akan	0.0211	0.008
Religion and Culture-Ewe	0.049	0.546
Religion and Culture- Ga	-0.028	0.727

Research Question 1. What do adolescent girls in Accra, Ghana know about Pap test screening? The variables used to assess knowledge (see Table13) were analyzed. The majority, 100 (70.92%) of the respondents had knowledge about the female genital tract

diseases while 41 (29.18%) did not. Most 90 (58. 1%) had not heard about cervical cancer while 65 (41.9%) did, 47 (35.6%) heard about cervical cancer through mass media while 85 (64.4%) had various responses. Most, 138 (92.0%) had never heard about Pap test/smear and only 12 (8.0%) had ever heard about Pap test Furthermore, only 19 (13.8%) knew that lesions could be treated early while119 (86.2%) did not know that lesions could be treated early. Only 2 (1.3%) had ever got Pap test done, 148 (98.7%) never had Pap test done, 123 (81.5%) were willing to pay for Pap test while 28 (18.5%) were not willing to pay for Pap test screening (see Table 15).

In the bivariate analyses, the correlation between knowledge about Pap test and screening were $\rho = 0.038$ and p vale = 0.0638 respectively. The results therefore show no significant association between knowledge about Pap test or cervical cancer and screening. However, there was significant association between knowledge about Pap test screening and educational level. The correlation between knowledge and education level was ρ 0.257 and p value = 0.002 respectively. This therefore showed that higher educational level was associated with knowledge about Pap test screening. Higher score on knowledge was associated with grade level. This means that as the educational level went up, the knowledge level about Pap test screening among the respondents also went up. Lower score in knowledge was associated with lower grade level. In the bivariate analyses, the Pearson correlation showed $\rho = 0.038$ with the significance level p value= 0. 0638 (see Table 21). This is statistically not significant therefore showed no association between knowledge and Pap test screening among the respondents.

Research Question 2. Does knowledge about cervical cancer affect intent to Pap test screening? The bivariate analyses between knowledge and intent to screen showed a correlation coefficient ρ = 0.0174 and *p* value = 0.032 (see Table 21) which is less than *p* value of 0.05 set as the significant level in the proposal. The results showed a significant association with knowledge and intent to Pap test screening so the null hypothesis can be rejected. Correlation between age of the respondents and education showed $\rho = 0.303$ and *p* value = 0.000 which is statistically significant (see Table 21) therefore showed that as the age of the respondents went up, so did their education or grade level go up as expected. There was no association between age and knowledge. The analyses showed a correlation of $\rho = -0.003$ and *p* value of 0.973 (see Table 21). Knowledge about Pap test screening increased with educational level. The correlation coefficient showed $\rho = 0.257$ and *p* value = 0.002 (see Table 21).

Research Question 3. Do attitudes affect intent to Pap test screening status among adolescent girls in Accra, Ghana? Analyses regarding attitude and the intent to screen among the adolescent girls' respondents show positive association between the variables. The majority of the respondents (see Table 21) had positive attitude to receive screening in future. The Logistic regression analyses also showed a correlation $\rho = 0.648$ and significance level *p* value = 0.001 (see Table 21). These results are statistically significant as such show a positive association between attitude and the intent to screen for cervical cancer, therefore the null hypotheses can be rejected.

Research Question 4. Does culture affect intent to Pap test screening status among adolescent girls in Ghana? Results shown in the table 20 below regarding Culture/Ethnicity and Intent to screen among the respondents, 59 (38.1%) were *Akan*, 45(29.0%) were of Ewe background, 23 (14.8%) were of *G*a ethnic background, and 28 (18.1%) were of other or different ethnic background. Among those with Akan ethnic background, 26 (44.1%) had intention to screen, while 33 (55.9%) had no intention to screen in future. Among those with *Ewe* background, 17 (37.8%) had intention to screen in the future while 28 (62.2%) had no intention to screen in future. Among those with *Ga* background 15(65.2%) of the respondents had intention to screen in future while 8 (34.8%) had no intention to screen in future. Among those with other ethnic backgrounds, 18 (64.3%) had intention to screen while 10 (35.7%) had no intention to screen. In all, 76 (49%) of the participants had intention to screen while 79 (51.0%) had no intention to screen. The Chi-square analysis showed a *p v*alue of 0.049 (see Table 21). In the Chapter 3, I proposed that significant level of less than 0. 05 would be considered statistically significant therefore *p* value of 0.049 is not statistically significant so the null hypotheses about culture and intent to screen cannot be rejected. Table 22 and Table 23 below show the relation between culture and the intent to screen by the high school girl respondents to study and statistical significance respectively.

Table 22

Ethnicity/Culture and Intent to Screen Score

Variables (Ethnicity/Tribes)	*n*	Frequency	Percent
Akan	59		
• Yes		33	55.9
• No		26	44.1
Ewe	45		
• Yes		28	62.2
• No		17	37.8
Ga	23		
• Yes		8	34.8
• No		15	65.2
Other	28		
• Yes		10	35.7
• No		18	64.3
Total	155		
• Yes		76	49.0
• No		79	51.0

Note. 2-sided Pearson Chi-Square = 7.880 (df=3), p = .049

Research Question 5. Do religious beliefs affect intent to Pap test screening among adolescent girls in Accra, Ghana? Analyses regarding religious belief and intent to screen among the participants who were Christians showed that 61 (51.3%) had intention to screen in future while 58 (48.7%) had no intention to screen in future. Among the Muslims, 7 (46.7%) had intention to screen while 8 (53.3%) had no intention to screen in future. Among those with different or other religious beliefs, 8 (38.1%) had intention to screen while 13 (61.9%) had no intentions to screen in future. In all, among the respondents, 76 (49.0%) had intention to screen in future while 79 (51.0%) had no intention to screen (see Table 23). The Chi-Square test showed a significance level or a *p* value = 0. 529 (see Table 23) which is higher than the proposed significant value of *p*

value = 0.05 as such not statistically significant therefore, the null hypothesis cannot be rejected.

Analyses regarding religious belief among participants and intent to screen showed that 61(51.3%) of the Christians had intention to screen in future while 58 (48.7%) had no intention to screen. Among the Muslims, 7 (46.7%) had intention to screen while 8 (53.3%) had no intention to screen in future. Among those with different or other religious beliefs, 8 (38.1%) had intention to screen while 13 (61.9%) had no intentions to screen in future. In all, among the respondents, 76 (49.0%) had intention to screen in future while 79 (51.0%) had no intention to screen. The Chi-Square test showed a *p* value of 0.529 which is higher than *p* value of 0. 05 and is not statistically significant therefore show that the null hypotheses cannot be rejected as shown in Table 23 below. The analyses of research question *5* and the intent to screen indicated by the respondents are shown in Table 23.

***Religion and intent to screen*.** Analyses regarding religious belief and intent to screen showed that among Christians about half (51.3 %) had intention to screen in future while 48.7% had no intention to screen. Among the Muslims, 46.7% had intention to screen while 53.3% had no intention to screen in future. Among those with different or other religious beliefs, 38.1% had intention to screen while 61.9% had no intentions to screen in future or had no responses. Overall, 49.0% of participants had intention to screen in future while 51.0% had no intention to screen.

Table 23

Religious beliefs and Intent to screen Score

Variables (Religious beliefs)	*n*	Frequency	Percent
Christian	119		
• Yes		61	51.3
• No		58	48.7
Muslim	15		
• Yes		7	46.7
• No		8	53.3
Other	21		
• Yes		8	38.1
• No		13	61.9
Total	155		
• Yes		76	49.0
• No		79	51.0

Note. 2-sided Pearson chi-square = 1.275 (df=2), p = .529

The analyses of correlation coefficient between religious beliefs and culture/ethnic background among the respondents (see Table 21) also showed $\rho = 0.0211$ and p value = 0.008 for Akan, $\rho = 0.049$ and p value = 0.546 for the Ewe, and Ga was $\rho = -0.028$ and p value = 0.727 respectively. Regarding the religious belief among the respondents and their intent to screen, being Christian showed $\rho = 0.298$ and p value = 0.001, Muslim showed $\rho = 0.527$ and p value = 0. 001, and those with other beliefs showed $\rho = -0.088$ and p value = 0.277 (see Table 21).

Summary and Transition

This chapter has presented several statistics and related analyses. This study results answers the *research question 1* that inner-city adolescent girls in Accra, Ghana have no knowledge about Pap test screening. The findings of the study show an extreme

poor knowledge about Pap test and cervical cancer among the respondents. The majority of the study participants (92.0%) had never heard about Pap test screening (see Table 7), 58.1% had no knowledge about cervical cancer, 35.6% heard about cervical cancer through radio, oral communication school, and church. Majority, 88.9% did not know about the causes of cervical cancer and only 11.11% had knowledge about causes of cervical cancer (see Table 7). In addition, 95.4% did not know how cervical cancer could be treated and 93.7% did not know cervical cancer could be prevented (see Table 7). The Statistical analyses showed no association between knowledge and Pap test screening (see Table 21).

With regards to *research question 2*, most (92.0%) study participants had no knowledge about Pap test and cervical cancer, did not know anyone in their circle who had cervical cancer, how it could be prevented or treated, and had no knowledge of how it could be prevented early. However, do intend to seek Pap test or cervical cancer screening due to knowledge and had moderate evidence against null hypothesis (see Table 7; Table 21). Concerning *research question 3*, the findings of the study showed that majority of the participants had a high positive attitude towards their intentions to seek Pap test screening to prevent cervical cancer (see Table 8; Table 21). The findings concerning *research question 4* shows that culture or ethnicity did not affect the intentions of the adolescent respondents to seek Pap test screening (see Tables 8; Table 21). The study findings regarding the *research question 5* also show that religious affiliation/ belief did not affect the intentions of the study participants to seek Pap test screening (see Table 8; Table 23). Chapter 4 is followed by chapter 5 where I fully

discuss the results, their interpretations of the findings, limitations, recommendations, implications, and contributions to the body of literature and public health.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Knowledge, culture, attitudes, and beliefs have been found to influence an individual's health seeking behavior and cervical cancer prevention practices (Ackerson, 2012; Ali-Rises et al., 2014; Bandera, 1977; Banka et al., 2016; Schiavo, 2007).The purpose of this study was to (a) obtain information to examine intentions among inner-city adolescent girls in Accra, Ghana to seek Pap test screening and (b) determine whether knowledge, culture, attitudes, and beliefs affected their intentions to seek Pap test screening. A quantitative methodology was used to conduct this study. I adopted a cross-sectional survey design using a semi-structured pen-and-paper questionnaire to collect information for data analysis. Cervical cancer cases and fatalities affecting women globally are of major social and public health concern. In less developed countries like Ghana, the epidemiological data regarding cervical cancer is alarming. Research has shown that in Ghana, 6.57 million women over 15 years of age are at risk of developing cervical, at least 3,000 women are diagnosed with cervical cancer, and at least 2,000 women die each year (Asante-Agei, 2010; WHO, 2010).Cervical cancer is also the most frequently diagnosed form of cancer in women in Ghana for women between 15 and 44 years of age (WHO, 2010).

Prior to this study, little was known about knowledge, culture, attitudes, beliefs, and cervical cancer screening practice and the intention to seek Pap test screening for cervical cancer among high school adolescent girls in Accra, Ghana. The findings of this study revealed that most female adolescents surveyed were culturally diverse, most

religiously Christian, and lacked knowledge about cervical cancer and cervical cancer screening practices but had positive attitudes about cervical cancer screening and had intentions to be screened for cervical cancer in the future.

The Pap test has proven to be the best effective method of detecting cervical cancer or early signs of cervical cancer for prevention and/or treatment (CDC, 2013). For developing countries like Ghana, the most effective tool for cervical prevention is regularly consulting a medical doctor for cervical cancer screening. However, there is a lack of national health awareness programs about Pap test screening. As such, most women in Ghana, especially adolescent girls, lack knowledge about cervical cancer screening.

The study participants were female adolescent high school students aged from 16 to 20 years with a mean age of 17.49 years. The majority (64.5 %) were 16 to 17 years old, while 35.58% were 18 to 20 years old. The majority, (98.1%) of participants was single, 96.1% had no children, and none smoked (see Table 5). The participants were ethnically/culturally diverse and mostly Christians. More than one third was from the Akan tribe. The study findings revealed that most (70.9%) of the adolescents had knowledge about various types of female genital track diseases. The majority (88.9%) of the students had no knowledge about causes of cervical cancer, most (95.39%) of the participants knew no one who was a victim of cervical cancer, 95.4% did not know how cervical cancer could be treated, 93.7% did not know how cervical cancer could be prevented, and 92.0% had not heard about Pap test screening or screening for cervical cancer. The majority (86.2%) did not know that suspect lesions could be detected early.

Most (see Table 8) of the participants had a positive attitude towards Pap test screening in the future; 61.3% of the participants indicated that they were willing to consult a medical doctor in case of vaginal bleeding between periods, 88.7% were willing to regularly consult a medical doctor for screening for cervical cancer, 81.5% were willing to get Pap test screening, and 96.0% were in favor of a national screening program to be made available in the future. Additionally, 57.4% of the participants indicated their willingness to pay for Pap test screening. Among the participants, 98.6% had not had a gynecological examination in the last 2 years, 92.9% indicated that their partners had no other partner beside them, and 98.7% never had screening for cervical cancer. Statistical analyses showed poor knowledge about cervical cancer among the respondents. Knowledge and attitude about cervical cancer had a statistically significant association with Pap test screening. However, cultural and religious beliefs had no statistically significant association with Pap test screening.

Interpretation of the Findings

This study results showed that the participants were culturally diverse. More than one third (38.17%) of the participants were from the Akan tribe, 29.0% were from the Ewe tribe, 14.8% were from the Ga tribe, and (18.1%) were from other ethnic backgrounds. The study findings showed that most (79.3%) of the adolescent female students in Accra, Ghana were Christians. Similarly, religious beliefs of the participants' parents/guardians were 79.9% Christians, 10.7% Muslims, and 9.4% other. The dominance of the Christian beliefs confirms studies by Binka et al. (2016) in Ghana among university students that showed that the majority, (92.2%) of the participants were

Christians and only a few (7.8%) were Muslims. Binka et al. (2016) also found that awareness of cervical cancer was significantly influenced by religious affiliations, and cervical cancer screening was significantly determined by the working status of the participants. In terms of marital status, the majority (98.16%) was single, 1.39% was divorced, and 0.65% was widowed. This confirms the studies in Brazil that revealed that most of the adolescent students were single (Soares de Lima et al., 2013). This study also confirms another study among university female study in Ghana where the majority of the participants (80.5%) were single and 2.2% were divorced or separated (Binka et al., 2016).

Concerning parity, the participants with no children were dominant with 96.1% while two participants (3.9%) had children. Among the participants who had children, they had one child each. Studies in Brazil with similar study participants showed that almost half (46.6%) had at least one pregnancy and 52.7% participants had their first sexual intercourse between 16 and 19 years of age. In bivariate analyses, there was no significant association between knowledge about Pap test screening. Also, there was no significant association age and knowledge about Pap test screening (see Table 21). However, there was a significant association with knowledge and intent to screen, knowledge about Pap test screening and educational level, being Christian and intent to screen, being a Muslin and intent to screen, and age and sexual partners (see Table 21). Research in Kinshasa, the Democratic Republic of Congo, showed that sociodemographic characteristics were significantly associated with having a sufficient level of knowledge,

age, place of residence, marital status, education, occupation, religion, and parity (Ali-Risasi et al., 2014).

Statistical analyses to test the research questions showed no significant association about knowledge and Pap test screening regarding Research Question 1 (see Table 21). This, therefore, shows that the adolescent high school girls in Ghana lacked knowledge about cervical cancer. As such, the null hypothesis cannot be rejected. Statistical analyses regarding Research Question 2 showed a statistically significant association about knowledge about cervical cancer and the participants' intent to Pap test screening (see Table 21). These findings show that there is a strong association between knowledge about cervical cancer and the intentions of the adolescent high school girls in Ghana to seek Pap test screening, which indicates that the participants are more likely to seek Pap test screening if they gain knowledge about Pap test screening. This, therefore, means that the null hypothesis can be rejected. Statistical analyses regarding Research Question 3 showed a statistically significant association between attitude and intent to Pap test screen (see Table 21). This means that the participants have a positive attitude about Pap test screening and are willing to seek Pap test screening. Therefore, the null hypothesis can be rejected. Chi-square test regarding Research Question 4 showed no statistical significant association between culture and intent to Pap test screen (see Table 21). This means that cultural practices or beliefs practiced by the participants do not affect their intentions to seek Pap test screen. This, therefore, means that the null hypothesis cannot be rejected. Chi-square test regarding Research Question 5 showed no statistical significant association between religious belief and intent to Pap test screening

(see Table 23). This indicates that the religious beliefs of the participants do not affect their intentions to seek Pap test screening. This, therefore, means that the null hypothesis cannot be rejected.

Knowledge of Pap Test and Cervical Cancer Screening

The results of this study show that the majority of the adolescent surveyed lacked knowledge about the Pap test. The majority (92.0%) of the participants had not previously heard about the Pap test or cervical smear and only 8.0% indicated that they had ever heard about it. On bivariate analysis, knowledge about cervical cancer was significantly associated with the intent to screen (see Table 21) which means that if the student is more likely to get screened in future as they get educated about Pap test and cervical. These results confirm the study in Kinshasa, the Democratic Republic of Congo by Ali-Risasi et al. (2014) who reported that only 12.2% of the women surveyed had ever heard about cervical cancer. Of those who had heard about it, 81.9% reported that they heard about it mostly through conversation with other people (Ali-Risasi et al., 2014). In contrast, in a similar study among adolescent female public school students in Natal, Brazil by Soares de Lima et al. (2013) found that 68.0% of the participants reported that they had previously heard about Pap smear, 31.1% had never heard about it, and only 5.1% had adequate knowledge about the Pap test screening. Abotchie & Shokah (2009) in their study found that female university students in Ghana were not aware of local screening programs for cervical cancer. However, a recent study among university students in Ghana showed that 53.4% of the female students were aware of screening for cervical cancer, while 44.6% were not (Binka et al., 2016). These could be due to the fact

that the majority of the university students were older and had higher educational level than the students in this study. In this study, bivariate analysis showed a strong association between educational level and knowledge about Pap test screening (see Table 21). This confirms the study by Ali-Risasi and colleagues which found a strong association between level of education, highly educated and knowledge about cervical cancer better than those who never went to school or only went to primary school (Ali-Risasi et al, 2014).

The findings of this study also show that the majority (70. 9%) of the participants had knowledge about different types of female genital track diseases and 29.08% were not. This confirms the study by Ali-Risasi et al. (2014) which indicated that most (96.0%) of the participants had knowledge about female genital disease. In addition, the results of this study show that most (58.06%) of the adolescent girls' lack knowledge about cervical cancer and 41.9% never heard about cervical cancer. This disconfirms Ali-Risasi et al.'s study where 81.9% of the women participants in Democratic Republic of Congo indicated that they had heard about cervical cancer. Among those who reported to have heard about cervical cancer in this current study, the majority (88.89%) did not know the causes of cervical, meaning and only 11.1% had knowledge about it causes. This confirms the study findings by Ali-Risasi et al. (2014) that 19.3% of the respondents knew the causes of cervical cancer and only 16.8% had ever heard of cervical smear. Ali-Risasi et al. also found that 15.1% of their participants knew someone who had cervical cancer, 17.6% knew how cervical cancer could be prevented, 17.2% knew how cervical cancer could be treated, and 15.0% indicated that having multiple sexual partners was a

risk factor for cervical cancer. Concerning cancer lesions, Soares de Lima et al. (2013) found, that 26.4 % indicated that HPV infection could cause cervical cancer. The majority (57.9%) knew that HPV was contracted through sexual contact. In a similar study among female university students in Ghana, Binka et al. (2016) 15.1% reported that alcoholism was a risk factor, 43% family history of the disease condition, 8.3% stated age at marriage, 2.6% exercise, and 31.0% did not know. With regard to treatment, this study also found that only 4.6% of the participants knew how cervical cancer could be treated while the majority (95.4%) did not know how it could be treated and provided other answers. The results of my study also confirm the study by Soares de Lima et al. (2013) which reported that only 18.3% of the participants knew that Pap test screening could prevent cervical cancer; 8.1% reported that it could prevent cancer, 37.9% reported that it prevented STDs, and 35.7% provided other answers. The findings of this study also show that majority (95.4%) had no knowledge about treatment of cervical cancer whereas only 4.6% reported that they had such knowledge. Binka et al. (2016) found that 68.7% of the Ghanaian university students surveyed disagreed that cervical cancer had no cure, 18.0% of the participants agreed cervical cancer has no cure, and 13.3% were uncertain. Binka et al. further reported that 62.8% of the participants agreed that cervical cancer could cause infertility while 29.8% of the participants disagreed that cervical cancer can cause infertility, and 7.4% were not certain.

With regard to prevention of HPV infections or cervical cancer risk, my study found that 95.5% had at least one or no sexual partner within the last year while only 3.47% reported that they had two or more sexual partner in the last year (see Table 17).

The majority (91.9%) did not know if their partners had other partners beside them whereas 8.1% did not know if their partners had other partners. The majority (60.5%) of Soares de Lima et al.'s study found that adolescent students in Natal, Brazil reported using condom during sexual intercourse and 3.5% avoided sex with multiple partners (see Table 17).

Attitudes About Pap Test and Cervical Cancer Screening

Table 8 lists five questions which I used to assess the adolescent girls' attitude concerning their intentions to seek Pap test in future. Most (61.3%) reported indicated their willingness to consult a medical doctor or seek medical care in case of vaginal bleeding between periods and 38.79% provided varied responses. These confirm studies by Ali-Risasi et al. (2014) that found that 80.0% of the respondents were willing to consult a medical doctor in case of abnormal bleeding between menstruations. Of the 38.69% who provided varied responses in this study (see Table 9), almost one half (47.17%) stated that they would inform their parents/guardians, 32.1% had no idea or did not know, and 5.7% indicated they would keep to themselves or prevent themselves (see Table 9). Others (11.32%) indicated that they would put a pad on or change pad regularly, 1.9% indicated that she would take medication while another 1.9% indicated that she would treat herself (see Table 9). This particular respondent did not indicate how she would treat herself. Majority (88.7%) of the respondents were willing to regularly consult a medical doctor for screening of cervical cancer whereas only 11.3% were not willing to regularly consult a medical doctor for screening for cervical cancer. These results also confirm the findings by Ali-Risasi et al. (2014) with 56.7% of similar

responds. In addition, 81.5% indicated that they were willing to get Pap test screening, 96.0% were willing to have a national screening program to be available in future, 57.4% were willing to pay for Pap test screening while 42.6% were not willing to pay for the screening (see Table 9). These results confirm Ali-Risasi et al.'s study which found that more than half (56.7%) of the participants were willing to regularly consult a physician for screening of cervical cancer, 80.0% were willing to have Pap test, and 95.0% were in favor of the installation of a national screening program. According to Ali-Risasi et al., even though most of the participants were willing to seek Pap test screening, more than one-third (31.7%) of the participants were prepared to pay for Pap test screening. In a similar study, Binka et al. (2016) found that majority (69.5%) of the participants who knew about screening for cervical cancer intended to be screened in the future whereas 30.5% did not intend to be screened for cervical cancer in the future. Bivariate analysis showed statistically significant association between attitude and intention to screen (see Table 16). Ali-Risasi and colleagues found that age, place of residence, education and religion were significantly associated with score on attitude (Ali-Risasi et al., 2014).

Pap Test and Cervical Cancer Practice

Concerning screening practice or behavior, this study found that only 1.4% of the participants had had gynecological examination in less than 2 years whereas 86.6% did not. Again, only 1.3% had ever had Pep test screening (see Table 10). This confirms studies by Ali-Risasi et al. (2014) which found that 84.0% of the participants had heard about cervical cancer but only 8.6% had ever had a Pap test screening and 67.9% had their last gynecological screening in less than 2 years. Soares de Lima et al. (2013) also

reported that 59.3% of the adolescent females studied had Pap test screening once every three years, 1.6% had Pap test but with an interval greater than three years, and 39.1% never had Pap test screening. This study also found that the majority (92.2%) did not use chemicals of plants for their intimate care but 7.8% indicated that they used chemicals of plants for their intimate care. These confirm the study in Kinshasa by Ali-Risasi et al. (2014) where most (71.0%) of the women indicated that they did not use chemicals of plants for their intimate care. This study also revealed that none of the participants smoked which confirm the findings by Ali-Risasi et al. (2014) which found that most (96.8%) of the participants never smoked. This study also found that the majority (93.6%) had one or no sexual partner in the last year and only 3.5% had two or more sexual partners in the last year. Bivariate analysis showed significant association between sexual partners and Pap test practice with $\rho = 0.222$ and $p = 0.005$ (see Table 21). Other researchers have reported that 4 in 10 Ghanaian adolescent girls had engaged in sexual intercourse whereas 12.0% were forced into their first sexual intercourse (http://www.guttmacher.org/pubs/rib/rib1-04.pdf). Soares de Lima et al. (2013) found that 53.8% of Brazilian adolescent females had their first sexual intercourse between 16 and 19 years of age.

Research shows that sexual risk behaviors increase the risk of STDs including HPV especially among adolescents (CDC, 2014). In this study, the majority (96.5%) of the participants had one or no sexual partner in the last year and only 3.5% reported that they had two or more sexual partners in the last year. This result confirms studies by Ali-Risasi et al which revealed that most (87.0%) of the participants reported to have had

sexual contact with a maximum of one sexual partner during the last year. However, while this study result showed that the majority (91.9%) of the participants reported that their partners did not have other partners beside them, the results counters the findings by Al-Risasi et al. (2014) which found that only 37.2% of the participants indicated that their partners did not have other sexual partners besides them. This finding is contrary to a U.S. study in 2013, which found that many adolescents engaged in risky sexual behaviors among U.S. high school students. In that study, 46.8% of the adolescents had ever had sexual intercourse, 34.0% had sexual intercourse during the previous 3 months, and of those, 40.9% had sex with four or more people during their life (CDC, 2014 a &b). However, 53.8% of adolescent students in the study by Soares de Lima et al. (2013) Natal, Brazil had sexual experience. In terms of ever had Pap test screening, the findings of this study confirm Ali-Risasi et al.'s study which found that only 8.6% of the participants had already had a Pap test screening.

Most adolescent students (47.7%) in this study indicated that they would inform their parents in case of vaginal bleeding between periods. On the contrary, Reddy, Fleming & Swain (2002 in their study about adolescents' confidentiality and health services reported that adolescents were very much concerned about their confidentialities. The adolescent girls were asked if they would continue to seek medical care for prescribed contraceptives and testing or treatment for HIV, STDs, if parental notification was mandatory. Reddy et al. (2002) found that 59% of the adolescent girl participants indicated that they would stop using all sexual healthcare services, delay testing or treatment for HIV or other STDs, or discontinue use of specific sexual health care

services if their parents were informed that they were seeking prescribed contraceptives (Reddy, Fleming, & Swain, 2002).

Pap Test Knowledge Variables

With regard to Pap test knowledge variables, this study found that the majority (70.9%) of the adolescents had knowledge about the diseases of the female genital track, 41.9% had heard about cervical cancer, and58.1% never heard about cervical cancer. This confirms Ali-Resasi et al.'s (2014) study in Kinshasa, Democratic Republic of Congo, which found that majority (82.0%), had heard about cervical cancer even though only 12.0% of the women mentioned cervical cancer as one of the female genital track diseases. This study results also confirm a study in Ghana among university female students where majority (85.6%) indicated that they had heard about cervical cancer, 53.4% were aware of screening for cervical cancer but 92.0% had never been screened in the last 2 years (Binka et al., 2016).This study also found that almost all (98.7%) of the participants never got Pap test screening and only 1.3% had screening in the last 2 years. These results are contrary to a similar study in Brazil among similar age groups that found that more than one third (39.1%) never had screening examination, 60.9% had at least once in their lifetime whereas 59.3%had screening at least once every three years.

Concerning Pap test screening knowledge, this study results show that the majority (92.0%) had never heard about Pap test screening and only 8.0% indicated that they had heard about it. These results confirm the study in the Democratic Republic of Congo that showed that 83.2% of the women had never heard of cervical smear and only 16.8% had ever heard of cervical smears. However, the results are contrary to a recent

study in Ghana where more than half (53.4%) of the female university students were aware of the screening for cervical cancer while 46.6% indicated that they were not aware of screening for cervical cancer (Binka et al., 2016). The higher percentage among university female student in Ghana could be due to the higher educational level as compared to these study participants at the high school level.

In this study, 35.6% indicated that they heard about cervical cancer through radio, television, oral communication, church, and schools. The study in Kinshasa found that the majority (73.4%) of the participants heard about cervical cancer mostly through oral communications with others, less frequently (30.3%) through the media, and only 3.7% received heard about cervical cancer through physician, medical center or a hospital. Considering the benefits of the screening, 86.2% of the students stated that they did not know that suspect lesions could be treated early while only 13.8% stated that it could be treated early. These results are contrary to the findings in the Democratic Republic of Congo where 57.8% indicated that they knew that suspect lesions can be detected early. The majority (81.5%) of the adolescents in this study stated that they were willing to get screening in future for cervical cancer while only 18.5% stated that they were not willing to get a Pap test screening. These results confirm the study in Democratic Republic of Congo that almost sixty percent (56.7%) of the women were willing to regularly consults a physician for screening of cervical cancer (Ali-Risasi et al., 2014).

Pap Test Knowledge About Risk Factors

This study findings show that the majority (70.9%) of the student participants had adequate knowledge about the disease of female genital tract while 29.1% had no

knowledge of the female genital tract disease and provided various different answers. This confirms the study in Brazil among adolescent students where most (57.9%) of the participants indicated that HPV was contracted through sexual contact, 31.7% did not know how HPV was contracted, and 87.9% did not know the causes of HPV (Soares de Lima et al., 2013). In this study, more than half (58.1%) of the respondents had not heard about cervical cancer whereas 41.9% stated that they had heard about cervical cancer. Among those who had heard about cervical cancer, 35.6% stated that they heard about cervical cancer through oral communication, radio, television, church or school while the majority (64.4%) provided various responses. A study in Ghana found that among participants who had heard of cervical cancer, (92.0%) had not been screened for cervical cancer in the last 2 years (Binka et al., 2016). Concerning smoking, none of the participants smoked and the majority (88.9%) did not know the causes of cervical cancer and only a few, 11.1% knew at least one cause of cervical cancer. Majority, 95.4% did not know how cervical cancer can be treated which indicate that more education is needed about cervical cancer prevention as well treatment, and only 4.6% knew how cervical cancer could be treated. Again, 93.7% did not know how cervical cancer can be prevented only few adolescents, 6.3% knew how cervical cancer can be prevented, 86.2% did not know that suspect lesions can be detected early and only 13.8%knew that suspect lesions could be treated early. This study confirms a similar study among adolescent students in Brazil indicated that only 18.3% of the respondents knew that Pap test screening could prevent cervical cancer (Soares de Lima et al., 2013). Gaining knowledge about Pap test screening can help to increase cervical cancer screening and

prevent or decrease the incidence and mortalities of cervical cancer. Studies have shown that Pap test is effective in identifying HPV infection and is credited with the decline of cervical cancer morbidity and mortalities in developed countries (CDC, 2010; WHO, 2018).

Cervical Cancer Risk Knowledge

Epidemiologic studies have shown that early age of first sexual intercourse, HPV infection, immunosuppressant, alcoholism, smoking, and genetic factors are risk factors associated with cervical cancer (CDC, 2004; CDC, 2012; Munoz, 12; WHO, 2007). The results from this study concerning cervical cancer risk knowledge indicated that the majority (96. 5%) of the adolescent students had one or no sexual partner in the last year while only 3.5% stated that they had two or more sexual partners. This disconfirms studies by Soares de Lima et al. (2013) among adolescent female students in Brazil where about half (53.8%) had sexual experience. The current study also indicated that the majority of the adolescent (85.6%) did not know if their partners had another partner beside them that can increase their risk being infected with STDs when not using protections during sexual intercourse. Several studies have shown that multiple or new sexual partners are risk factors for cervical cancer (CDC, 2010; Soares de Lima et al., 2013). None of participants smoked and that supports the findings in the Democratic Republic of Congo, which found that none of the women studied smoked (Ali-Risasi et al., 2014).

Other studies showed that among college students, perception of susceptibility was not often associated with the practice of healthier behaviors even when the

perception of risk was high (Courtenay, 1998). Research also shows that although college students considered themselves to be at risk for HIV because they did not practice safe sex, they still did not change their behaviors to practice safer sex (Lewis & Malow, 1997) or stop smoking even though they perceived it to be a risk factor for lung cancer (CDC, 2012). Risk factors for HPV infection include sexual behaviors, lifetime history of sex partners, having multiple sexual partners, and sexual intercourse at a young age (CDC, 2012).

In this study, most of the participants (58.1%) indicated that they had not heard about cervical cancer and 93.7% lacked knowledge about how cervical cancer can be prevented. This result confirms research findings among University female students in Ghana which showed that almost half (46.6%) were not aware of cervical cancer (Binka et al., 2016) as such increased their risk of cervical cancer. Other researchers report that lack of screening and inadequate treatment of pre-cancerous lesions are some of the risk factors for HPV infections, as well as not using condom during sexual intercourse, inconsistent condom use, and number of pregnancies (CDC, 2011; McIntyre-Seltman et al., 2005; Schiff man, et al., 1996).

In addition, 41.9% had ever heard about cancer of the uterine cervix while 58. 06% stated that they had ever heard about cancer of the uterine cervix. Regarding if the adolescents had ever heard about cervical, and how they heard about it, 35.6% of the adolescents provided the expected answers including through oral communication, radio, television church, and school; and 64.4% provided different answers. The majority (93.7%) of the participants did not know how cervical cancer be prevented while only

6.7% knew how it can be prevented, 95.4% did not know anyone in their circle of acquaintance had cervical cancer while only 4.6% knew some in their close circle who had had cervical cancer. These findings confirm the study findings in Brazil where the researcher found that knowledge about risk factor for cervical cancer was associated with sexual experience and pregnancy (Soares de Lima et al., 2013).

Cultural Beliefs

This study found that although the participants were culturally diverse, there was positive association of being from the Akan tribe and being a Christian. This study also found that cultural beliefs or practices did not have statistically significant association between participants' intentions and Pap test screening. This is contrary to the studies in the United Kingdom among participants with different ethnic and religious background found that some of the Pakistani women described Muslim beliefs as potentially prohibitive of Pap test screening (McCaffery, et al., 2003). Chavez, Hubbell, McMullin, Martinez & Mishra (1995) wrote that cultural beliefs present barriers for seeking medical services among Latinas and that Latinas who believed that sex-related behaviors were the most important risk factors for cervical cancer were less likely to seek Pap exams than Latinas who disagreed with such beliefs (Chavez et al., 1995).

Freeman (2004) wrote that disparities in cancer are caused by factors such social injustice and cultural beliefs. Such beliefs can prevent women from getting information about their health and lack of information together with cultural beliefs could lead many to seek home or traditional remedies to maintain health as well as different ways to cure some illnesses before turning to modern medicine, regardless of their professional

occupation or level of education (Nyamongo, 2002).This study results disconfirm the study by Rosario (2010) which reported that 80% of the Micronesia women identified religion as the source of the sense of morality associated with an extreme sense of shame about something. Although, some people knew that Pap test was highly beneficial they had negative stigma attached to unmarried women going for Pap screening due to their religious beliefs. Most (73%) of the participants attached the stigma of having had unprotected sex and possibly having acquired an STD to an unmarried woman seeking a Pap test (Rosario, 2010). The same percentage, 73.0%, also attached the stigma of having multiple partners and behaving promiscuously to an unmarried woman seeking a Pap test so Rosario concluded that the purpose of the Pap test was misunderstood by 27.0% and 20.0% equated it with STD testing (Rosario, 2010). This current study results showed that Ghanaian communities have various cultural, church groups and beliefs but in spite of the cultural and religious diversities, this study findings indicate that cultural or religious belief would not affect Ghanaian female adolescents' intentions to seek preventive cervical cancer care.

Religious Beliefs

This study results also indicated that the majority of the participants (79.33%) and their parents/guardians (79.9%) were predominantly Christians, 10.0% were Muslims, and 10.7% had other beliefs, as well as 10.7% Muslims of their parents/guardians, and 9.4% had other beliefs respectively. Table 23 shows that there was no statistically significant association between Religion and intent to screen with p value of 0.529 so the null hypothesis cannot be rejected. Religious beliefs may influence a patient's

understanding and significance of health, ways to deal with healthcare professionals, how to cope with illness, influences decision making, meaning, attitude toward death, and family's involvements (McCaffery, et al., 2003; Rosario, 2010; Sekyere, 2011; Shiavo, 2007).

However, Table 21 shows that being Muslim and Christian had strong association with intention to screen with $\rho = 0.527$ and *p* value of 0.001 as well as $\rho = 0.298$ and *p* value = 0.001 respectively. These findings confirm the study by Ali-Risasi and colleagues which reported that religion had strong association with attitude score regarding screening (Ali-Risasi et al., 2014). In addition, Ali-Risasi et al, (2014) found that religion had significant association with knowledge about cervical cancer and women who adhered to religions other than Catholicism and Protestantism were less likely to obtain sufficient knowledge score as compared to those who declared that they were Catholic. The findings of this study also confirm the studies by Binka et al. (2016) that found that 92.2% of the female university students in Ghana were Christians and only 7.8% were Muslims and that religious beliefs did not affect the participants' intentions to get Pap test screening. Among the 150 participants, the majority (88.7%) indicated their willingness to regularly consult a medical doctor for screening of cervical cancer. Majority 123 (81.5%) of the 151 respondents sated that they were willing to get a Pap test. These findings disconfirm previous study in Ghana by Sekyere (2011) that most Christians in Ghana seek help from religious leaders when they are sick. According to Sekyere (2011), Ghanaian Christians believe that seeking healing from God comes first before western medicine therefore people spend time at prayer camps and seek healthcare services at the

hospital as the last resort when the condition is advanced or the disease reaches an incurable state (Sekyere, 2011).

Another study in Ghana revealed that religious affiliations had significant effect on knowledge of AIDS and men's behavior towards AIDS due to their perception (Takyi, 2003). A study in Greater Manchester, United Kingdom among participants with different religious and ethnic background indicated that Muslim beliefs were described by some of the Pakistani women as potentially prohibitive of Pap test screening (McCaffery, et al., 2003). These findings disconfirm the results of the current study which showed that cultural and religious beliefs had no statistically significant association with the intentions of the participants to seek Pap test screening (see Table 21 and 23).

Findings in the Context of Theoretical/Conceptual Framework

The analyses of the theoretical/conceptual framework showed that the majority of the participants perceived themselves to be susceptible to cervical cancer and paying for Pap test screening was not perceived to be a barrier to Pap test screening. Analyses of perceived benefits showed that few (13.8%) of the participants had prior knowledge that suspect lesion could be detected early. The majority (61.3%) had intentions to seek medical care and 95.9% were in favor of a national screening program to be available in future. Perceived self-efficacy analyses showed 81.46% were willing to seek Pap test screening, 92.2% did not use chemical plants for their intimate care, 98.7% never had Pap test screening and 88.7% were willing to consult a medical Doctor for cervical cancer screening. Perceive social support analyses showed that 96.0% were in favor of a national

screening program to be made available in future and 58.1% had not heard about cervical cancer. Cues to action analyses showed that 92.0% of the participants had not heard about cervical cancer, no one ever smoked 58.6% had never heard about cervical cancer, 61.3% had intention to seek medical care, 70.9% had knowledge about various types of STDs but poor knowledge about cervical cancer. The analyses of the theoretical concepts helped to explain the health problems among the participants and are further explained under their respective subheadings below.

Perceived Susceptibility to Cervical Cancer

The majority of the respondents perceived themselves to be at risk of cervical cancer concerning vaginal bleeding between periods (see Table 14). The majority (61.31%) of the participants indicated that they would consult a medical doctor or go to a health center whiles while 38.7% provided varied responses as to what they would do. The construct of perceived seriousness talks about an individual's belief about the seriousness or severity of a disease. This study finding confirms the assertion of McCormic-Brown (1999) that although perception of seriousness is often based on knowledge or medical information, it may also come from beliefs that a person has about the difficulties a disease would have on his or her life in general (McCormick-Brown, 1999). Research shows that an individuals' perception about lung cancer risks could motivate them to quit smoking (Krosnick et al., 2017) and confirms the findings of this study that participants indicated their willingness to seek medical care in case of vaginal bleeding. Majority (88.7%) of the participants also indicated their willingness to regularly consult a medical doctor for screening for cervical cancer while only11.3% indicated that

they were not willing to regularly consult a medical doctor for screening. Majority (81.56%) of the participants also indicated their willingness to get Pap test screening only and 18.5% indicated that they were not willing to get Pap test screening. The higher percentage of the participants to get screened for cervical cancer confirms the results obtained by Binka et al. (2016) in female college students in Ghana that showed that 69.5% of the participants had intention of getting screened in the future for cervical cancer. Another study among adolescent students in Natal, Brazil showed a greater adequate attitude toward cervical cancer screening (Soares de Lima et al., 2013). Regarding the participants' willingness to pay for a Pap test, most (57.4%) indicated that they were willing to pay for the screening and 42.6% stated that they were not willing to pay for the screening. The high number of the students who were willing to pay for the screening could be due to the socio-economic status of their family income giving the fact the participating school was a privately owned institution ad only those families with high income could afford to send their students to that school. This supports the study in Brazil that attitude towards HPV was associated with family income (Soares de Lima et al, 2013). Other researchers however, reported that cost of the screening for cervical cancer and pains were some of the reasons why some women do go for cervical cancer screening (Leyva, Byrd, & Tarwater, 2006).

The findings of this study also revealed that Pap test screening practice was low among the participants. Majority (98.7%), of the participants indicated that they never had Pap test screening and only 1.3% stated that they ever had a Pap test screening. These results confirm the studies in Kinshasa, the Democratic Republic of Congo where

although 84.0% of the participants had heard about cervical cancer, only 9.0% had ever had Pap test screening (Ali-Risasi et al., 2014) and among female students in Ghana where 92.0% had not been screened in the last 2 years (Binka et al., 2016). Two (1.3%) participants who were 20 years old and had a Pap test done and one had given birth with one child and this result confirms a similar study among similar age group in Brazil where the adequacy of Pap test practice was associated with age, marital status, and pregnancy. Adequate attitude to screening was also associated with age, sexual experience, and pregnancy (Soares de Lima et al., 2013).

The majority (96.5%) of the participants had one partner or never had a partner before in their lifetime while 3.5% reported that they had two or more sexual partners in the last year. Majority (92.9%) reported that their partners did not have a partner beside them while 8.1% stated that they did not know, 64.5% were between 16 to17 years of old and 35.5% were between 18 to 20 years old. These findings disconfirm the study in Brazil where, about 54.0% of the adolescents had sexual experience and of the 253 adolescents who had initiated sexual activities, 52.7% had their first sexual intercourse betwen16 and 19 years old while 46.6% had at least one pregnancy (Soares de Lima et al., 2013).

Perceived Barriers to Pap Test Screening

Several studies have shown that cost of screening has been one of the reasons why most women fail to go get screened for cervical cancer (Ackerson, 2012; Binka et al., 2016). However, the findings of this study revealed that most (57.4%) adolescent girls were willing to pay for Pap test screening and a 42.6% stated that they were not willing to

pay for Pap test screening. A previous study revealed that social stigma, embarrassments, emotional, and financial burden in Ghana could be barriers for Pap test screening (Edwin, 2010). Numerous studies reveal that lack of knowledge is one of the reasons why women do not seek Pap test screening (Nwankwo, Aniebue, Aguwa, Anarado, & Agunwah, 2011). In this study, the majority (86.2%) of the adolescent girls surveyed did not know that suspect lesions can be treated early while only 13.8% knew that suspect lesions could be detected early. In addition, majority (92.0%) indicated that they had never heard about cervical smear or Pap test screening while only (8.0%) stated that they had heard about it. This is contrary to the study by Binka et al (2016) among Ghanaian university students. Of 351 respondents in that study, 187 (53.4%) were aware of screening for cervical cancer while 164 (46.6%) of the students stated that they were not aware of cervical cancer screening. The high percentage of the findings by Binka et al could be because the university students were older even though 22.0% of the participants were less than 20 years old and had higher educational level than the participants of this current study had. Even with almost half (46.6%) of the university student who were not aware of the cervical screening attest to the fact that more health education and promotion about Pap test screening and cervical cancer need to be a priority in Ghana educational systems to increase awareness. Soares de Lima et al (2013) found different reasons why the adolescent students in Brazil surveyed did not screen at the recommended intervals. More than one quarter (28.5%) indicated that due to the absence of symptoms was the reason while 25.3% indicated that being embarrassed to go for Pap test screening was the reason they did not screen as per the recommendations of the Brazilian Ministry of Health.

Edwin (2010) wrote that knowing that HPV which cause cervical is an STD can cause social stigma and embarrassment in Ghana as such could prevent women from Pap test screening. Other factors found to be barriers to screening include lack of knowledge about Pap tests, provider attitudes, and limited access to physicians (Ibekwe et al., 2011).

This study also showed that the majority (95.4%) of study participants did not know how cervical cancer could be treated and provided various responses and only 4.6% of the respondents knew how cervical cancer could be treated. Binka et al (2016) reported that 10.5% of the study participants disagreed that all women were at risk of cervical cancer. In their study, Fort, Makin, Siegler, Ault, & Rochat (2011) reported that major barriers to seeking preventative screening included low knowledge levels, low perceived susceptibility, and low perceived benefits from the service. Fort et al reported that study participants did not view cervical cancer screening as critical healthcare issue (Fort, et al., 2011).

Cultural practices have been found to affect health-seeking behaviors among people with certain cultural or religious believes. This study revealed that only 7.8% of the participants used chemicals of plants for their intimate care instead of seeking professional healthcare services and the majority (92.3%) did not use chemical of plants for their intimate care. Other study in the Democratic Republic of Congo indicated that 71.0% of the participants did not use chemicals of plants for their intimate care indicating that about 30% used chemicals of plants for their intimate care. Cultural and health beliefs in this study showed no statistical significant association with participants' intentions to seek Pap test screening. This disconfirms the study by Moshkovich et al.

(2015) in United States that indicated that health care centers frequently described patient-level barriers to cervical cancer screening to cultural and health belief/behavior factors (Moshkovich, et al., 2015).

Perceived Benefits From Pap Test Screening

Concerning benefits of cervical cancer screening, this study finding showed that only 13.8% of the participants knew that suspect lesions could be detected early while 86.2% stated that they did not know that suspect lesions could be detected early. Binka et al (2016) in their study revealed that 82.4% of the female university students in Ghana agreed that cervical cancer screening was beneficial while only 7.6% disagreed that it was beneficial and 10.0% were not certain. This confirms CDC (2011) that cervical screening has many benefits in the society in reducing the fatalities in the society. However, Soares de Lima et al (2013) in their study reported that only 18.3% of the participants indicated that Pap test could prevent cervical cancer and that was the reason for the need of Pap test screening. With the question of what participants would do in case of vaginal bleeding between periods, this study found that most (61.3%) would consult a medical doctor or go to a health care center while 38.7% provided varied responses. The majority (96.0%) of the participants also wanted a national screening program to be available in the near future while only 4.0% did not. This confirms the study by the CDC (2011) that screening programs are especially effective for regular screening, which is cost-effective, affordable, acceptable and accessible to the majority of the population at risk (CDC, 2013). According to the CDC (2011), education to promote early diagnosis, screening, and recognizing possible warning signs of cancer and taking

timely action leads to early diagnosis. McCaffery et al (2003) wrote that despite the perceived stigmatizations of HPV testing among certain ethnic women from the white British and African-Caribbean groups, participants expressed positive views about Pap test screening, and welcomed the added protection that HPV testing provides cervical cancer prevention. Other studies have found lack of knowledge about benefits of Pap test screening contribute to low level of women adhering to cervical cancer screening procedures in Brazil (Soares de Lima et al., 2013).

Perceived Self-Efficacy to Pap Test Screening

With regard to the question if the participants were willing to get Pap test, the majority (81.5%) indicated their willingness to seek Pap test while only18.5% indicated that they were not willing to seek Pap test. This shows that giving the opportunity, most of the adolescent girls surveyed were willing to be screened for cervical cancer. This confirms the study by Binka et al. (2016) which reported that 69.5% of the participants who had knowledge about cervical cancer intended to be screened for cervical cancer in the near future while only 30.5% did not intend to get screened in the future. The majority (92.3%) of the participants indicated that they did not use chemicals of plants for their intimate care while only 7.8% indicated that they used chemicals of plants for their intimate care which does not support other study that showed that about 70.0% of patients in Ghana used herbal medicine (WHO, 2005). Studies show that herbals or chemicals of plants are common among the indigenous people in Ghana for treatment. This study revealed that 7.8% of the participants used chemicals of plants for their intimate care instead of seeking professional healthcare services even though the majority

(92. 3%) did not use chemical of plants for their intimate care. The number was even higher in other study in the Democratic Republic of Congo where 71.0% of the participants did not use chemicals of plants for their intimate care indicating that about 30.0% used chemicals of plants for their intimate care (Ali-Risasi et al., 2014).

Concerning ever had Pap test screening, the majority (98.67%) never had Pap test screening while only 1.3% ever had Pap test. This study also confirms the study by Soares de Lima et al. (2013) that showed that of 253 respondents who had started sexual activities, 99 (39.1%) had never took the Pap test examination and 60.9% had tested at least once. Binka et al (2016) also reported that 92.0% of the participants had never had a Pap test in the last 2 years while only 8.0% had screening for cervical cancer. Again, this study result also confirms the study by Ali-Risasi et al. (2014) that showed that although 84.0% of the participants had heard about cervical cancer, only 9.0% had ever had a Pap test. Concerning the willingness to regularly consult a medical doctor for cervical cancer screening, majority (88.7%) were willing to consult a medical doctor for cervical cancer screening while only 11.3% indicated were not willing to consult a medical doctor for screening. This result again confirms Ali-Risasi et al.'s study about the women living in Kinshasa, Democratic Republic of Congo that showed that most (56.7%) were willing to regularly consult a physician for screening of cervical cancer.

These findings also support the assertions by Bandura (1990) who wrote that perceived self-efficacy play influential role to control over behavior that carries risk of AIDS effective programs of self-directed change. According to Bandura, information designed to increase awareness and knowledge of health risks, development of the social

and self-regulatory skills needed to translate informed concerns into preventive action. Bandura (1990) further claimed that skill enhancement and building resilient self-efficacy through guided practice and corrective feedback in applying the skills in high-risk situations and enlisting social supports for desired personal changes (Bandura, A., 1990).

Perceived Social Support to Use Pap Test

This study results showed that the majority (96.0%) of female adolescent participants wanted a national screening program to be made available in the future and only few (4.0%) did not. The findings support studies by Ali-Risasi et al. (2014) which found that 95.0% of the women wanted a national screening program to be made available. In addition, among the adolescents surveyed, less than half (41.9%) had heard about cervical cancer but the majority (58.1%) had not heard about it. Among those who had heard about cervical cancer, 35.6% stated that they heard about it through at least one of the expected answers such as the radio, television, church, school, and oral communication, and majority provided different answers regarding perceived social support. Such lines of communications help others whom otherwise might not seek healthcare services to seek preventive health services. Another study among university female student in Ghana by Binka et al. (2016) found that the majority (80.0%) of the participants who had ever sought screening for cervical cancer in the last 2 years indicated that, their doctors explained their results to them and 20.0% indicated that their doctors did not explain their results to them. According to Binka et al. (2016), more than half (53.4%) were aware of Pap test screening for cervical cancer and 46.6% were not aware of the screening. Of those who were aware of the screening, 92.0% had not been

screened in the last 2 years while only 8.0% had been screened in the last 2 years and the majority (69.5%) who knew about Pap test screening indicated their intentions to get Pap test screening in the future.

Several studies show that women's limited access to health services in society and restrictions on married women may affect their effort to seek healthcare services especially for those who are not married to seek health services due to religious beliefs (Fatimi & Avan, 2002; Stephenson & Henninik, 2004). These includes even if it comes to consulting a physician in urgent situations (Van der Stuyft, Sorensen, Delgado & Bocaletti, 1996). Lack of social support or stigmatization, or shame in the community is found to prevent people from seeking healthcare services. Rosario (2010) writes that, "sense of shame" works as a self-monitoring system for a woman who uses shame to express reluctance to seek gynecological care". According to Rosario, shame has to do with how one is perceived by others in the community, which in turn contributes to identity (Rosario, 2010). Other researchers have reported that inappropriate sexual activities are perceived as promiscuous behavior within cultural beliefs about morality and virtue in some cultures like Ghana (Chavez, et al., 2001).

Cues to Action

With regards to cue to action, most (92.0%) of the student had not heard about cervical cancer and disconfirms studies in Brazil where 68.9% of the adolescent student participants reported that they had previously heard about Pap smear (Soares de Lima et al., 2013). Concerning smoking, none of the students smoked as expected in the Ghanaian culture among such adolescent female age groups. Concerning knowledge

about cervical cancer, most (58.1%) had never heard about cervical cancer. This result contradicts the studies in Kinshasa, the Democratic Republic of Congo where the researchers found that 84.0% of the participants had heard about cervical cancer even though only 9.0% had ever had a Pap test done (Ali-Risasi et al., 2014). In the study in Ghana, Binka et al., (2016) found that most (79.7%) of the female students studied agreed that all women were at risk of cervical cancer, 10.5% disagreed that all women were at risk of cervical cancer, and 69.5% of the participants who knew about screening for cervical cancer had intentions of getting screened in the future. Concerning an attempt to find out if friends, family, or their close circle of acquaintances had cervical cancer, only 4.6% of the participants indicated that they knew someone who had cervical cancer while the majority (95.4%) indicated that they did not know someone who had cervical cancer. These results are similar to the study in Kinshasa (Ali-Risasi et al., 2014) where only 15.1% indicated that they knew some in their neighborhood diagnosed with cervical cancer. A recent study shows that cervical cancer fatalities is the highest among women aged 15-44 years old in Ghana (WHO, 2010a) and leading cancer death in females beside breast cancer in Ghana (Chireh, 2011). In Ghana, annual new cases of cervical cancer among women 15 years and older is projected to be 5,007 and cervical cancer death to be 3,361 by 2025 (WHO, 2010a). The HBM suggests that certain events, incidence, or reminders also influence behavior. Cues to action are events, people, or things that influence or motivate people to change their behavior and Graham (2002) gives examples as the illness of a family member, media reports (Graham, 2002), mass media campaigns pictures depicting a disease or an illness, advice from others, reminder postcards from a

health care provider (Ali, 2002). Weinrich et al. (1998) also wrote that knowing a church member with a prostate cancer is a significant cue to action for African American men to attend prostate cancer education programs (Weinrich et al., 1998). A study to explore how women in rural Malawi made health-seeking decisions regarding cervical cancer screening using qualitative research methods, found that the primary *cue to action* for cervical cancer screening was symptoms of cervical cancer (Fort et al., 2011).

Concerning what would students do in case of vaginal bleeding between periods, the majority (61.3%) indicated that they would seek medical help, go to the hospitals, or consult a medical Doctor while 38.7 % provided varied responses including telling their parents. This finding confirms studies by Ackerson et al. (2008) that found that women were known to be socially influenced by their family and their physicians. Ackerson and colleagues concluded that exploring beliefs associated with Pap test and perceptions of vulnerability to cervical cancer as well as giving correct information and counseling may increase Pap test screening among women (Ackerson, e t al., 2008).

The majority (70.9%) of the participants had knowledge about various types of STDs but poor knowledge about cervical cancer or cancer of the cervix while 29.1% provided varied response. Poor knowledge about cervical cancer can negatively affect the desire or the motivation for the students to seek preventive health services such as Pap test screening. Studies show that communications about risks are often aimed at helping individuals to understand risks and the belief of making behavioral changes or healthy choices. Weinstein (1999) writes that decisions about personal risks require minimum information about the nature and possibility of negative consequences (Weinstein, 1999).

This therefore underscores the importance for the adolescent girls in Ghana to get more education about cervical cancer, the risks, and benefits of Pap test screening to help them make behavioral changes or healthy choices about cervical cancer prevention.

Limitations of the Study

As with many studies, this study has several limitations that need to be discussed. The limitations include: (a) the study was conducted in Accra metropolitan area in Ghana, therefore, the findings may not be generalizable to the entire high school female adolescent students in Ghana, (b) although the targeted population included female adolescents studying in high schools in Accra metropolitan areas, the participants were drawn from one private high school, which is generally considered as middle to upper socio-economic status in the Ghanaian culture, (c) students from such social-economic status may be able to afford to pay for Pap test screening hence a high percentage rate of responses concerning their willingness to pay for a Papa test screening therefore, the study results may not be representative of the population of the adolescents girls in Ghana who attend public high schools. A similar study in Brazil by Suares de Lima et al. (2013) among adolescent female students and the participants were drawn from different public schools, (d) even though, HPV vaccination is considered the most effective way to prevent HPV infection besides abstinence, there was no question included in the questionnaire regarding knowledge about HPV, (e) Additionally, there were items in the questionnaire that elicited self-report information on sensitive issues, such as number of sexual partners, knowledge about diseases of the female genital tract, what to do in case of vaginal bleeding between periods, and Pap test screening. The potential existed that

participant's responses were biased to provide culturally or socially desirable responses; (f) knowing that HPV is transmitted through sexual intercourse can have social stigma, embarrassments, and emotional burden in Ghana which can be barriers for Pap test screening. These factors could have also prevented participants from providing honest information needed for this study. However, in other to obtain honest information as possible, the participation was voluntary and information provided was confidential with the belief to prevent bias responds from the participants. Besides that, participants were reminded of the confidentiality of their responses and that no one would be able to identify them by their responses, (g) although questionnaire can be used in quantitative method, the closed questions may not have provided opportunities for the participants to provide adequate information about their desires, perceptions for, and barriers to Pap test screening. Responses to some of the open-ended questions were not in the answer keys (the expected answers). These responses, however, were important and could be included in future studies. For example, for questions regarding Pap test and cervical cancer knowledge, *question 7 asked: How can cervical cancer be prevented?* Some of responses were *"Prevention of sexual intercourse"* could prevent cervical cancer. Another respondent also stated that she heard about cervical cancer through the internet but internet was not among the expected answers, (h) the study was conducted between June and July and around that time, some of the high school seniors had finished writing their Government mandated certification examinations as requirements for graduation so they were not available to take part in the study. This might have led to the low number of participants aged between 18 to 20 years. It was in this age group, that participants had a

child each and had Pap test screening within the last 2 years, (i) prior to that start of this study, the literature reviews showed no data among the study population. I did not do a pilot study and relied on the studies with similar socio-demographic information. Regardless of the limitations listed above, this study serves as first step to systematically investigate and document how knowledge, attitude, and practice (KAP) as well as culture and religious beliefs affect Pap test screening among adolescent girls in Ghana.

Recommendations

Quantitative method has its strengths and weakness and was used for this study. The chapter 2 literature review included qualitative studies, which would be important additions to gain more insights into the perceptions, attitude, and knowledge of the adolescent girls in similar studies. This is based on the results from this study where some of the participants were able to provide responses in the open-ended questions outside of the expected answers and I find them to be important factors of HPV infections and one cause of cervical cancer, which is the avoidance of sexual intercourse. Some participants stated that they heard about cervical cancer through the internet and Facebook but were not in the expected answers in this study so should be considered the future studies. This study was done between June and July and at that time, most of the seniors (final year) students had completed their Government mandated exams to graduate so they were not attending school anymore. To this end, future research among similar study population in Ghana should be done before the end of May of that year with the aim of getting more seniors students to participate in the study before they graduate from school. Since there was lack of literature about this study population and the objectives of the study, further

quantitative studies are needed in Ghana among similar study population to confirm or disconfirm the findings of this study. In addition, using qualitative method research in future studies in similar situations can help provide in depth information about knowledge, culture, attitude, religious belief, and practice to guide policies, research, and practices among similar study population.

Implications

Cervical cancer continues to be a global health concerns especially in developing countries. The findings of this study indicate that female adolescent high school students in Accra, Ghana lack knowledge about cervical cancer, its causes, preventions, treatments, and Pap test screening. These findings therefore increase their risk of cervical cancer. The findings add to the body of literature and may guide research, policy, and practice in Ghana. Resources are needed in Ghana to guide educational campaigns to create awareness to help prevent or decrease the incidence, prevalence, and mortality associated with cervical cancer. Although, there was no data among this study population before this research, literature review during this study revealed that female university students also had poor knowledge about cervical cancer and Pap test screening. These factors increase the risk of the adolescent females in Accra in particular and Ghanaian women in general concerning cervical cancer. These require intensive public health awareness campaign to increase awareness in the community especially in high schools. These study findings also revealed that most participants had adequate knowledge about HIV/AIDs and other forms of genital track diseases but lacked knowledge about HPV

and can lead to lack of or poor protection against HPV infection and cervical cancer among women in Ghana.

The implications for positive social change from this study are that findings have shown knowledge gap about cervical cancer and Pap test screening among female students in Accra, Ghana and can help guide policy formulations, practices, and future research to promote healthy sexuality and awareness for cervical cancer among women. These require cervical cancer educational programs in the communities with the active involvement of all stakeholders including educational institutions, places of worships, healthcare facilities, workplaces, social media companies, and community organizations with the collaborations with the national strategy for cancer control, ministries of health, education, gender and social protection. The intent is to educate and inform the community members to increase awareness regarding the causes, preventions, screenings, and treatments of cervical cancer. Additional stakeholders to involve are parents or guardians, heads of schools, teachers, traditional and religious leaders, policy makers, and healthcare professionals in order to be consistent with socio-cultural values in Ghana. Furthermore, health educations and promotions in senior high schools are needed to incorporate into the school curriculums to enable the students to learn about cervical cancer preventions, and treatments. Such education curriculum can help those students who might not have the opportunity to continue their education at college or tertiary institutions to receive further education on sexualities and cervical cancer. Even at the college or tertiary institutions, most of the students have low knowledge about cervical cancer and no intentions to seek cervical cancer preventions. Binka et al. (2016) study

found that most students at the universities in Ghana had not heard about cervical cancer and about 30.5% had no intentions to seek Pap test screening. Other studies also confirm these results that most female university students have poor knowledge about cervical cancer, poor cervical cancer screening rate, but have positive attitude and intentions to get screen in the future (Abotchie & Shakoh, 2009; Binka et al., 2016). These findings suggest that educational programs in the high school settings can be useful to prepare the women for healthy futures. A well-planned health education program regarding HPV infections, vaccinations, Pap test screening, and cervical cancer preventions are needed in high school settings. In Ghana, some high school graduates do not attend tertiary institutions or colleges. Therefore, it is important to start health education and promotions at the high school level so that those who do not get the opportunity to further their educations can gain basic knowledge about cervical cancer and Pap test screening.

Adolescents may indulge in risky sexual behaviors (CDC, 2011) so there is the need to increase educational programs about cervical cancer and preventions. Study findings reflect the importance of the parents/guardian role for girl's sexual information. Findings from current study showed that few students receive cervical cancer information from their parents/guardians and some participants indicated that they would inform their parents/guardians in case of vaginal bleeding between periods. Therefore, parents/ guardians should also be educated about HPV and its mode of transmission, cervical cancer, and causes of cervical cancer, cervical cancer causes, treatments, and prevention in order to educate the adolescent girls under their care. Study findings also indicate that churches, schools, healthcare professional, media, and oral communications were ways

the girls heard about cervical cancer. In view of these findings, religious leaders, health care professionals, and media companies could play important roles in cervical cancer and screening awareness campaign in communities to increase knowledge and screening status among women in the community.

The healthcare professionals in the school settings should also encourage HPV preventions and the vaccination, Pap test screening, and cervical cancer education and promotion to increase knowledge and awareness level among students. Findings of this study reveal that HPV infection as compared with HIV/AIDs lacks needed publicity in Ghana and create gab in knowledge about HPV/cervical cancer, and HIV/AIDS. The majority of the adolescents reported that they would want a national screening program to be available. Although, the finding reveals that participants were willing to seek screening for cervical cancer, the availability, accessibility, and affordability to health care services are important steps to improving the goals of public health in every community hence the need for resources. The National health services/Ghana ministry of health with collaborations with Ghana education services and ministry of gender and social protection should assist with health and wellness campaigns regarding causes of cervical, preventions, treatments, and cervical cancer screening in Ghanaian schools and in communities. Such efforts should aim at increasing the levels of knowledge and awareness concerning cervical cancer and the benefits of screening, clarify perceptions against screening, and encourage early diagnosis and treatments in the communities.

Conclusion

Women's awareness about cervical cancer is an essential step to prevent or decrease incidence, prevalence, and mortality of the disease that has plagued women globally and in developing countries like Ghana. This study revealed that most adolescent high school girls in Accra, Ghana surveyed lacked knowledge about cervical cancer and Pap test screening. Majority of the participants did not know how cervical cancer could be treated or prevented, lacked knowledge about risk factors for cervical cancer. The findings show that there is a need for educational campaigns in schools to increase knowledge levels and practices of cervical cancer. The findings suggest that educational campaigns about cervical cancer prevention should start at high school levels before the students graduate or move on to colleges/universities. Starting educational campaign at the high school levels is an important intervention point because not all high school students, especially females get opportunity to go to colleges/universities to gain further knowledge about cervical cancer and Pap test screening. Therefore, providing education at the high school level can increase knowledge levels among the women in the society and increase preventions and Pap test screening among women in Ghanaian society.

The study also revealed that majority of the adolescent high school females had positive attitude about cervical cancer, Pap test screening, and high intention to seek screening for cervical cancer in future. The findings of this study and literature reviews indicated that the adolescent high school females and females in the Ghanaian universities had poor knowledge about cervical cancer. Therefore, the results suggest the need for educational campaigns about cervical cancer prevention in schools to improve

the level of knowledge and awareness regarding the importance of prevention, Pap test screening, and cervical cancer in other to increase early diagnoses. Study results also revealed that students lacked knowledge about Pap test, religious beliefs and cultural practices did not affect intention to seek Pap test screening among the students participants as were hypothesized by the researcher in the proposal as such the null hypothesis could not be rejected, however, the results revealed that knowledge about cervical and attitude had positive association about their intention to screen and were statistically important so the null hypotheses could be rejected. The majority of participants and their parents/guardians were of the Christian faith and willing to consult a medical Doctor/health care facility in case of vaginal bleeding. The majority were also willing to regularly consult a medical Doctor for cervical cancer screening, get cervical cancer screening, willing to pay for Pap test screening, and wanted national screening program to be made available.

In conclusion, I found that the adolescent high school girls in Accra, Ghana who participated in the study had poor knowledge about cervical cancer and Pap test screening. Culture and religious beliefs did not have significant association with their intention to get screened for cervical cancer. Although culturally diverse and mostly Christians, the participants had positive attitudes about cervical cancer and intentions to seek Pap test screening. The findings showed statistically significant associations between knowledge and attitude about cervical cancer and intent to screen. Most of the high school girls were in favor of national screening programs. These suggest the need for effective educational campaigns in Ghanaian high schools as well as in the

communities to improve upon the knowledge and awareness levels regarding the health risk associated with cervical cancer and the benefits of Pap test screening.

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Appendix A: Study Questionnaire

HIGH SCHOOL ADOLESCENT GIRL STUDENTS' SOCIO-DEMOGRAPHIC INFORMATION

1. What is the name of your high school? _____

2. Level of Education: Which grade are you in? Please check one

a) SHS1 ____ b) SH2_____ c) SHS3_____ d) SHS4_____

3. What is your Ethnicity or Tribe?: Akan:___ Ewe____Ga____Other (specify)_____

4. What is your Religion?: Christian____Islam ____Other (Specify)_____

5. What is your Religion of your parents/guardian?:Christian____ Islam _____Other (Specify)_____

6. What is your date of birth? : Month _____ Day_____ Year_____

7. In what city or town do you live? Accra _____Medina ____Other (Specify)_____

8. Marital Status: Single _____Married_____Divorced_____Widowed_____

9) Parity: Do you have children? Yes____No___ If you have children, how many?____

PAP TEST (PAP SMEAR) AND CERVICAL CANCER (Ali-Risasi et al, 2014)

KNOWLEDGE

1. Which diseases of the female genital tract do you know?_____
2. Have you ever heard about cervical cancer or cancer of the uterine cervix?:

   Yes_____No_____
3. If you have ever heard about cervical cancer, how did you hear about it?_____
4. What are the causes of cervical cancer?_____
5. In your close circle of acquaintances, do you know someone who has had cervical

   cancer?:Yes____No_____
6. How can cervical cancer be treated?_____
7. How can cervical cancer be prevented?_____
8. Have you ever heard about cervical smears?: Yes_____No_____
9. Do you know that suspect lesions can be detected early?:

   yes_____No_____

ATTITUDE

1. What would you do in case of vaginal bleeding between periods?_____
2. Are you willing to regularly consult a medical doctor for screening of cervical

   cancer? Yes_____No_____
3. Are you willing to get a Pap test or smear test?: Yes_____No_____
4. Would you want that a national screening program be made available in the future?:

   Yes_____No_____

5. Are you willing to pay for a Pap smear test?: Yes_____No_____

PRACTICE

1. When was your last gynaecological examination?: _____
2. Do you use chemicals of plants for your intimate care?: Yes_____No_____
3. Do you smoke? Yes_____No_____
4. How many sexual partners have you had in the last year?_____
5. Does your partner have a partner beside you?_Yes_____No_____
6. Have you ever got a Pap test or Pap smear

   test?:Yes_____No_____

Appendix B: Published Survey Instrument

Ali-Risasi et al. 2014

Additional file 1: Questionnaire

KNOWLEDGE

10. Which diseases of the female genital tract do you know?
11. Have you ever heard about cancer of the uterine cervix?
12. How did you hear about it?
13. What are the causes of cervical cancer?
14. In your close circle of acquaintances, do you know someone who has had cervical cancer?
15. How can cervical cancer be treated?
16. How can cervical cancer be prevented?
17. Have you ever heard about cervical smears?
18. Do you know that suspect lesions can be detected early?

ATTITUDE

6. What would you do in case of vaginal bleeding between periods?
7. Are you willing to regularly consult a medical doctor for screening of cervical cancer?
8. Are you willing to get a smear test?
9. Would you want that a screening national program would be made available in the future?
10. Are you willing to pay for a Pap smear test?

PRACTICE

7. When was your last gynaecological examination?
8. Do you use chemicals of plants for your intimate care?
9. Do you smoke?
10. How many sexual partners have you had in the last year?
11. Does your partner have a partner beside you?
12. Have you ever got a Pap smear test?

Additional file 2: Questionnaire, expected answers, and scoring system

KNOWLEDGE

19. Which diseases of the female genital tract do you know?

- Expected answers:
  - leucorrhoea
  - infections or sexually transmitted diseases
  - cancer of the uterine cervix
  - ovarian cysts
  - uterine tumour or myoma
  - dysmenorrhea
  - galactorrhoea
- Scoring: 1 point for a description of 1 disease from the list, 2 points for a description of 2 diseases and 3 for descriptions of 3 diseases from the list

20. Have you ever heard about cancer of the uterine cervix?

- Expected answer: yes
- Scoring: 1 point if yes

21. How did you hear about it?

- Expected answers:
  - oral communication
  - newspaper
  - television
  - radio
  - conference
  - medical doctor or at the hospital
  - church
  - school
  - non-governmental organisation
- Scoring: 1 point if at least one of the listed answers is given

22. What are the causes of cervical cancer?

- Expected answers:
  - many sexual partners
  - use of plants for intimate care
  - sexually transmitted diseases
  - HIV infection
  - papilloma virus

- old age

- Scoring: 1 point if at least one of the listed answers is given

23. In your close circle of acquaintances, do you know someone who has had cervical cancer?

- Expected answer: yes

- Scoring: 1 point if yes

24. How can cervical cancer be treated?

- Expected answers:
  - surgery
  - chemotherapy
  - radiotherapy

- Scoring: 1 point if at least one of the listed answers is given

25. How can cervical cancer be prevented?

- Expected answers:
  - avoid multiple sexual partners
  - avoid HIV infection
  - use condoms
  - vaccination

- Scoring: 1 point if at least one of the listed answers is given

26. Have you ever heard about cervical smears?

- Expected answer: yes

- Scoring: 1 point if yes

27. Do you know that suspect lesions can be detected early?

- Expected answer: yes
- Scoring: 1 point if yes

ATTITUDE

11. What would you do in case of vaginal bleeding between periods?

- Expected answers:
  - consult a medical doctor
  - go to a health centre
- Scoring: 1 point if at least one of the listed answers is given

12. Are you willing to regularly consult a medical doctor for screening of cervical cancer?

- Expected answer: yes
- Scoring: 1 point if yes

13. Are you willing to get a smear test?

- Expected answer: yes
- Scoring: 1 point if yes

14. Would you want that a screening national program would be made available in the future?

- Expected answer: yes
- Scoring: 1 point if yes

15. Are you willing to pay for a Pap smear test?

- Expected answer: yes, or a concrete amount
- Scoring: 1 point if yes or any amount >0 US$

PRACTICE

13. When was your last gynaecological examination?

- Expected answer: any moment in the past 2 years
- Scoring: 1 point if less than 2 years ago

14. Do you use chemicals of plants for your intimate care?

- Expected answer: no
- Scoring: 1 point if no products are used

15. Do you smoke?

- Expected answer: no
- Scoring: 1 point if the participant has never smoked (0 points for current or past smokers)

16. How many sexual partners have you had in the last year?

- Expected answer: maximum one
- Scoring: 1 point if maximum one partner in the last year

17. Does your partner have a partner beside you?

- Expected answer: no
- Scoring: 1 point if no

18. Have you ever got a Pap smear test?

- Expected answer: yes

Scoring: 1 point if a smear test had been performed in the past

Appendix C- Permission to Use Figure 1

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TJ

Appendix D-Permission to Use Figure 2

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Confirmation Number: 11836937
Order Date: 07/30/2019

Customer Information

Customer: Collins Asamoa-Afriyie
Account Number: 3001486164
Organization: Collins Asamoa-Afriyie
Email: asamoallc@yahoo.com
Phone: +1 (862) 235-3165

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Order Details

Journal of adolescent health : official publication of the Society for Adolescent Medicine

Billing Status: **N/A**

Order detail ID: 71965131
ISSN: 1054-139X
Publication Type: Journal
Volume:
Issue:
Start page:
Publisher: ELSEVIER INC.
Author/Editor: SOCIETY FOR ADOLESCENT MEDICINE (U.S.)

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Appendix E- WHO-Information Disclosure Policy

The World Health Organization (WHO) is committed to making information about its activities available to the public. WHO considers public access to information a key component of effective engagement with all stakeholders, including WHO's Member States and the public, in the fulfillment of its mandate. Public access to WHO information facilitates transparency and accountability and enhances trust in WHO's activities to further public health.

Purpose and Objective

This Information Disclosure Policy ("This Policy" and "this Policy") is intended to ensure that information concerning WHO's activities is made publicly available, subject to the limitations set out in this Policy. To that end, this Policy explains principles, practices and procedures and defines clear categories of information according to their status with regards to public disclosure. Information held by WHO is made available primarily through the WHO website, Regional Office and country office websites and webpages of WHO hosted-partnerships. Specifically, information on WHO's Program Budget (PB) and financing is available through the Program Budget Web portal1. WHO documents are available through WHO's institutional repository for information sharing (IRIS).

Scope of the Policy

This Policy applies to all Information in the custody of WHO for the purposes of this Policy, "Information" means any produced content, in any medium (paper,

electronic or sound, visual or audiovisual recording) concerning a matter relating to WHO's activities.

This Policy does not apply to data collected in Member States, which are governed by WHO's data sharing policies. Information jointly owned with third parties, for example, memoranda of understanding, donor agreements, and other contractual arrangements, will be made available on a case by case basis with the agreement of the parties concerned.

General principles of access to information

Information accessible to the public shall be made available, as far as reasonable and practical, through the WHO website. An overview of information presently available to the public (or which is made available on an on-going basis) is listed in Annex 1. Annex 1 sets out an overview of publicly available information (i.e. information which is available on the WHO website). "Publicly available information" about WHO, the work of WHO, health programs, information about health (by health topic), WHO health emergencies program.

Global Health Observatory (GHO) data, information about and reports of WHO technical meetings, WHO work at country level, Common Country Assessments/United Nations Development Assistance Frameworks (CCA/UNDAF). Country Cooperation Strategies developed with other UN system agencies. Country Program Documents, WHO constitution and basic documents, governance and oversight. Governing bodies, world health assembly, regional committees, executive board, and program budget and administration committee. Independent oversight and independent expert oversight

advisory committee. Independent oversight advisory committee for WHO emergencies program. Engagement with non-State actors. Framework of engagement with non-State Actors. Global engagement management tool (for Framework of Engagement with non-State Actors).

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