A study of the relationship between prevention and barriers to human papillomavirus/cervical cancer vaccination among African-American women in Georgia

Annalease M. Gibson
CLARK ATLANTA UNIVERSITY

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ABSTRACT

SCHOOL OF SOCIAL WORK

GIBSON, ANNALEASE M. B.S.W. ALBANY STATE UNIVERSITY, 2005
M.S.W. CLARK ATLANTA UNIVERSITY, 2006

A STUDY OF THE RELATIONSHIP BETWEEN PREVENTION AND BARRIERS TO HUMAN PAPILLOMAVIRUS/CERVICAL CANCER VACCINATION AMONG AFRICAN-AMERICAN WOMEN IN GEORGIA

Committee Chair: Robert W. Waymer, Ph.D.

Dissertation dated May 2015

This study examines the barriers of cervical cancer prevention among African-American women in Georgia. One hundred and seventeen (117) women in Georgia were conveniently selected in varying settings to participate in a twenty-two survey questionnaire based on prevention and barriers of cervical cancer. The participants answered yes or no questions about visiting a gynecologist/health clinic for women’s health, previous participation of cervical cancer screenings, previous vaccination of cervical cancer/human papillomavirus, and barriers of cervical cancer. Various questions were related to barriers of knowledge of cervical cancer/human papillomavirus, perceived susceptibility, and attitudes towards screening measures. The findings of the study indicate that there is a statistically significant relationship between participation of...
cervical cancer and the barriers of knowledge and perceived susceptibility. Conversely, there is no statistically significant relationship between the barrier of attitudes toward screening measures.
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A DISSERTATION SUBMITTED TO THE FACULTY OF CLARK ATLANTA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

BY

ANNALEASE M. GIBSON

WHITNEY M. YOUNG, JR., SCHOOL OF SOCIAL WORK

ATLANTA, GEORGIA

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CHAPTER I

INTRODUCTION

Human papillomavirus (HPV) ranks as the most commonly acquired sexually transmitted infection in the United States, and infection with HPV is linked to cervical cancer and genital warts. Human papillomavirus (HPV) is the name of a group of viruses that infect the skin. There are more than 100 different types of HPV. Some types of genital HPV may cause genital warts, while others types of genital HPV are linked to abnormal cell changes on the cervix that can lead to cervical cancer (American Social Health Association, 2012).

Approximately six million new cases of sexually transmitted HPV occur in the United States each year. At least 20 million people estimated to be currently infected. Most people with HPV do not know they are infected. HPV can infect anyone who has ever had a sexual encounter. HPV is spread through skin-to-skin contact, not through an exchange of bodily fluid. Human papillomavirus is an extremely common sexually transmitted disease, with an estimated 80% of sexually active people contracting it at some point in their lives (American Social Health Association, 2012).

Each year, approximately 12,000 women are diagnosed with cervical cancer in the United States. In most cases, cervical cancer can be prevented through early detection and treatment of abnormal cell changes that occur in the cervix years before
cervical cancer develops. We now know that these cell changes are caused by human papillomavirus. The traditional test for early detection has been the Pap test. Tests for HPV are available that can be used with the Pap test in women starting at 30 years of age and in women of any age when the Pap test alone has found slightly abnormal cells (American Social Health Association, 2012).

All women with cervical cancer have had a human papillomavirus (HPV) infection at some time in their life. However, most women with an HPV infection will never get any disease related to that infection. Also, most HPV infections will clear up by themselves. Over the last 50 years, routine Pap test screening for cervical cancer has reduced deaths from the cancer by 74% (Women’s Cancer Network, 2012).

In almost all cases, the immune system will keep the virus (including the cancer-related HPV types) under control or get rid of it completely. However, if HPV infection does not go away over many years, there is a greater chance of developing cell changes that may lead to cervical cancer. This may happen very rarely (American Social Health Association, 2012).

HPV can be contracted from one partner, remain dormant, and then later be unknowingly transmitted to another sexual partner, including a spouse. Latex condoms can reduce—but not eliminate the risk of HPV transmission. About 11,000 cases of cervical cancer are diagnosed in the United States each year. Over 4,000 women die from cervical cancer each year in the United States. Cervical cancer is the first cancer in women to be identified as being caused almost exclusively by a virus (American Social Health Association, 2012).
In June 2006, Merck produced the first HPV vaccine that was approved by the Food and Drug Administration. This approval was for females aged 9 - 26 years. After the approval, the National Advisory Committee on Immunization Practices recommended that the vaccine be given to girls aged 11 to 12 years. The approval of these vaccines helps to prevent sexually transmitted diseases and cervical cancer (Sussman et al., 2007).

Statement of the Problem

American Cancer Society has statistical analysis about cervical cancer for 2011. About 12,710 women will find out they have invasive cervical cancer this year. Also in 2011, about 4,290 women died from cervical cancer. Hispanic women and African-American women are more likely to get cervical cancer than non-Hispanic white women. Half of the women who get cervical cancer are between 30 and 55 years of age (American Cancer Society, 2014).

The identification of social barriers that influence participation of the vaccination for cervical cancer will be examined in this study. Human papillomavirus is an extremely common sexually transmitted disease, with an estimated 80% of sexually active people contracting it at some point in their lives (American Social Health Association, 2012).

Purpose of the Study

The purpose of the study is to examine the relationship between cervical cancer prevention, social barriers, and cervical cancer vaccination among African-American females in Georgia. The barriers that will be examined include (1) Knowledge of
Cervical Cancer; (2) Perceived Susceptibility; and (3) Attitudes Toward Screening Measures. A survey questionnaire on demographics, prevention, and barriers will be used in this study.

Research Questions

The research questions for the study are as follows:

1. Is there a relationship between human papillomavirus/cervical cancer prevention and the knowledge of females toward human papillomavirus/cervical cancer?
2. Is there a relationship between human papillomavirus/cervical cancer prevention and the female’s perceived susceptibility of cervical cancer?
3. Is there a relationship between human papillomavirus/cervical cancer prevention and the attitudes of females towards cervical cancer screening measures?
4. Is there a relationship between the knowledge of females toward human papillomavirus prevention and those who have actually been vaccinated for cervical cancer?

Hypotheses

The null hypotheses for the study are as follows:

1. There is no statistically significant relationship between papillomavirus/ cervical cancer prevention and the knowledge of females toward human papillomavirus/cervical cancer.
2. There is no statistically significant relationship between human papillomavirus/cervical cancer prevention and the female’s perceived susceptibility of cervical cancer.
3. There is no statistically significant relationship between human papillomavirus/cervical cancer prevention and the attitudes of females towards cervical cancer screening measures.

4. There is no statistically significant relationship between the knowledge of females toward human papillomavirus prevention and those who have actually been vaccinated for cervical cancer.

Significance of the Study

African-Americans are more likely to suffer from diseases, lack access to health care, and die earlier than their white counterparts (Hattery & Smith, 2007). The principal mission of the social work profession is to enhance human well-being and help meet the essential human needs of all people (National Association of Social Work (NASW) Code of Ethics, 2008). This study examines the relationship between prevention and barriers among African-American women related to cervical cancer vaccination.
CHAPTER II
REVIEW OF LITERATURE

This chapter is a review of the current literature related to this study. The intent is to develop a better understanding of how to promote more cervical cancer screenings and HPV vaccinations of African-American women through acknowledgement of barriers according to African-American women in Georgia. This chapter is divided into five sections. The sections are an overview of Cervical Cancer and African-American females; Cervical Cancer Prevention; Cervical Cancer Vaccination; Cervical Cancer Barriers; and Theoretical Framework.

Cervical Cancer and African-American Women

Cervical cancer is the second most common cancer among women worldwide and over 300,000 women die from this cancer each year. In the United States (US), 12,000 women are diagnosed with cervical cancer and 4000 women die from it each year. Healthy People 2020, the United States’ 10-year agenda for improving the nation’s health, called for an increase in cervical cancer screening rate and a reduction in the rates of invasive cervical cancer and human papillomavirus (HPV) infections among women in the U.S. (Ratanasiripong, Cheng, & Enriquez, 2013).

The development of cervical cancer nearly always begins with HPV infection. More than 100 different HPV types have been identified and approximately thirty types
infect the genital tissues. High-risk, oncogenic HPV types (e.g., HPV 16 and HPV 18) are responsible for 99.7% of all cervical cancers while low-risk HPV types (e.g., HPV 6 and HPV 11) can result in mild cervical abnormalities, genital and respiratory tract warts. Approximately 20 million Americans ages 15–49 are currently infected with HPV and another six million females and males become newly infected each year. In the female population, the prevalence of genital HPV infection peaks among women aged 20–24 years (44.8%) and gradually declines among women aged 25–59 years (19.6–27.5%). About 10% of women who contract high risk HPV types develop persistent infections that can cause cervical cancer and negative health outcomes (Ratanasiripong et al., 2013).

Cervical cancer begins in the cervix. The cervix is the lower part of the womb, called the uterus. It opens to the vagina. Cervical cancer was once the number-one cause of death from cancer in women. Due to the Pap test, which can screen for this cancer, the number of women in the United States with cervical cancer has decreased dramatically. With the Pap test, doctors can also find changes in the cervix when they are still precancerous. It is the only gynecological cancer, currently, that can be prevented through routine screening (Women's Cancer Network, 2012).

To understand where your cancer is, it may help to know more about the cervix. The cervix is one part of your reproductive system. It is the lower part of your womb, also called the uterus. The cervix connects your uterus and vagina. Your vagina leads to the outside of your body and the vulva, which is the skin area where you have pubic hair. These are the other parts of your reproductive system. The pelvis has the vagina, two ovaries, and two fallopian tubes. The cervix has two parts. The outer part, closest to
the vagina, is called the ectocervix. The inner part, closest to the uterus, is called the endocervix. Where these two parts meet is where most cervical cancers start. This is also called the transformation zone. Many layers of cells make up the cervix. The two types of cells that are on the surface of the cervix are the squamous epithelial and the columnar epithelial. Squamous epithelial cells line the outer part of the cervix. Columnar epithelial cells line the inner part of the cervix (Women’s Cancer Network, 2012).

According to Alschuler (2010), the worldwide incidence of cervical cancer is about 440,000 cases annually. In the United States, there are an estimated 15,000 cases of cervical cancer each year, representing an annual incidence of 8.7 per 100,000 women. The mortality rate for cervical cancer among non-Hispanic white women in the United States is 2.6 per 100,000 and 4.9 per 100,000 for African American women. In the United States, cervical cancer is most prevalent and more deadly in socioeconomically disadvantaged black and Hispanic women.

Cervical cancer incidence is 60% higher among black women than among White women and cervical cancer mortality among Black women is the highest of any racial or ethnic group. As a result of high poverty rates among African Americans, African American women are more likely to live in neighborhoods characterized by severe economic deprivation, high population density, and few screening and medical services, such as a Pap test -- the most effective means to screen for cancer. Poverty, race, and gender create barriers to risk-reduction and access to medical services (Andrasik, Rose, Pereira, & Antoni, 2008).
Viral infections are estimated to play a causal role in some 20% of human cancers. Infections leading to cancer are disproportionately frequent in developing countries. Globally, in 2008, it is estimated that 2,100,000 cancer cases—or 16.4% of all cancer burden—were due to unresolved viral infections. Cervical cancer is the end stage of an unresolved HPV infection, currently defined as the persistent presence of HPV DNA in repeated testing of cervical specimens. In many industrialized countries, the rate of prevalent infections in young adult females is as high as 40–80% and the lifetime (Bosch, Tsu, Vorsters, Van Damme, & Kane, 2012).

The etiology of cervical cancer has been unequivocally linked to persistent infection with less than 15 HPV types. Probability of ever encountering HPV is as high as 80–90%. Most of these infections clear spontaneously without clinical signs or symptoms. The fraction of persistent carriers of HPV is estimated in a range of 4–10%; these women are the true high-risk group for cervical cancer and probably for any other HPV-related cancer. The underlying factors driving the process to clearance or persistent infection are still unknown. The time lag between the peak of HPV infection and cancer incidence is two to four decades, making cervical cancer an appropriate target for screening and early detection (Bosch et al., 2012).

In addition to cervical cancer, HPV infection has been associated with a number of other cancers and non-cancerous conditions in both men and women, which are also potentially preventable through use of HPV vaccines. In cancers of the vagina and their precursor lesions, HPV DNA is detected in the majority of cases. In recent reviews, from 64–91% of vaginal cancer cases and from 82–100% of vaginal intraepithelial neoplasia of grade 3 (VAIN3) lesions were reported to be HPV DNA-positive. An
estimated 40–50% of cancers of the vulva have also been associated with HPV (Bosch et al., 2012).

HPV can cause normal cells on infected skin to turn abnormal. Most of the time, you cannot see or feel these cell changes. In most cases, the body fights off HPV naturally and the infected cells then go back to normal. But in cases when the body does not fight off HPV, HPV can cause visible changes in the form of genital warts or cancer. Warts can appear within weeks or months after getting HPV. Cancer often takes years to develop after getting HPV (Centers for Disease Control, 2012).

Cervical infections by approximately 15 cancer-associated (carcinogenic) human papillomavirus (HPV) genotypes cause virtually all cervical cancer and its immediate precursor lesions worldwide. It is increasingly evident that prophylactic HPV vaccines will provide the greatest public health or population benefit only when delivered to adolescent women (Castle et al., 2009).

Human papillomavirus (HPV) causes cervical cancer. About 15 strains are directly linked with pre-cancers or cancer. Two of those strains cause more than 70% of all invasive, abnormal growths in the cervix (Women’s Cancer Network, 2012).

Approximately 20 million Americans are currently infected with HPV. Another 6 million people become newly infected each year. HPV is so common that at least 50% of sexually active men and women get it at some point in their lives. About 1% of sexually active adults in the U.S. have genital warts at any one time. Each year, about 12,000 women get cervical cancer in the U.S. Almost all of these cancers are HPV-associated. Other cancers that can be caused by HPV are less common than cervical cancer. Each year in the U.S., there are about 1,500 women who get HPV-associated
vulvar cancer; 500 women who get HPV-associated vaginal cancer; 400 men who get HPV-associated penile cancer; 2,700 women and 1,500 men who get HPV-associated anal cancer; 1,500 women and 5,600 men who get HPV-associated oropharyngeal cancers (cancers of the back of throat including base of tongue and tonsils (Centers for Disease Control, 2012).

Certain populations are at higher risk for some HPV-related health problems. This includes gay and bisexual men and people with weak immune systems (including those who have HIV/AIDS) (Centers for Disease Control, 2012).

HPV infection is more common among women in their late teens and twenties. However, the infection usually does not become cancer. HPV strains linked to causing cervical cancer increase the risk of changes that can become cancerous. That is why close follow-up by a doctor is recommended if you have HPV. Your risk of HPV increases with the number of sexual partners you may have had. Sexual intercourse before the age of 18 is also a risk factor for increasing chances of cervical cancer. Other things that increase the risk of cervical cancer are poor nutrition, poor immune function (such as from HIV/AIDS), and smoking. But even women who do not have these risk factors may still get cervical cancer. Therefore, all women should get regular Pap tests (Women’s Cancer Network, 2012).

HPV is passed on through genital contact, most often during vaginal and anal sex. HPV may also be passed on during oral sex and genital-to-genital contact. HPV can be passed on between straight and same-sex partners—even when the infected partner has no signs or symptoms. A person can have HPV even if years have passed since he or she had sexual contact with an infected person. Most infected persons do not realize
they are infected or that they are passing the virus on to a sex partner. It is also possible
to get more than one type of HPV (Centers for Disease Control, 2012).

Human Papillomavirus is a very common virus. Most men and women are
infected with HPV at some time in their lives. There are approximately 100 types of
HPV. Some types typically infect the genital area and may cause warts, some cause mild
changes in cervical cells that do not turn into cancer, and some cause changes that may
become cervical cancer if present for many years. The types of HPV that are found in
the genital areas are usually passed down during sexual contact (sexually transmitted).
Genital HPV types do not spread outside the genital area (American Social Health
Association, 2012).

Most people have never heard of HPV until they are diagnosed (ashastd.org,
2012; wcn.org, 2012). The net result is that very few people ever have the chance to
place genital HPV in an accurate context. According to an article published in 1997 in
the American Journal of Medicine, about 74% of Americans, nearly three out of four,
have been infected with genital HPV. Among those ages 15-49, only one in four
Americans have not had a genital HPV infection. Genital HPV produces no symptoms
or illness, and so a person who has been infected may never know about it. Experts
estimate that nearly 1% of sexually active Americans will have genital warts. Far more
women have abnormal Pap tests related to HPV infection, but in most cases health care
providers do not explain the link between HPV and cervical infection, perpetuating the
misunderstanding (American Social Health Association, 2012).

HPV are DNA viruses that infect skin or mucosal cells. There are more than 100
known HPV genotypes, at least 13 of which can cause cancer of the cervix and are
associated with other anogenital cancers and cancers of the head and neck; they are called high-risk genotypes. The two most common of these (genotypes 16 and 18) cause approximately 70% of all cervical cancers. HPV (especially genotypes 6 and 11) can also cause genital warts, a common benign condition of the external genitalia that causes significant morbidity (WHO, 2006).

HPV is highly transmittable, with peak incidence of infection soon after the beginning of sexual activity. Most people acquire the infection at some time in their life. Factors contributing to development of cervical cancer after HPV infection include immune suppression, multiparty, early age at first delivery, cigarette smoking, long-term use of hormonal contraceptives, and co-infection with *Chlamydia trachomatis* or Herpes simplex virus (WHO, 2006).

Banister et al. (2014) conducted a study that recruited a population-based longitudinal cohort of 326 European American and 113 African American female college freshmen in Columbia, South Carolina to compare clearance of high-risk human papilloma virus (HR-HPV) infection between ethnicities. HPV testing and typing from Pap test samples occurred every six months.

African American participants had an increased risk of testing positive for HR-HPV compared to European American participants but the frequency of incident HPV infection was the same in African American and European American women. Thus, exposure to HPV could not explain the higher rate of HPV positivity in African American women. The time required for 50% of participants to clear a HR-HPV infection was 601 days for AA (n=63) and 316 days for European American (n=178) women (OR 1.61, 95% CI 1.08-2.53). African American women were more likely than
European American women to have an abnormal Pap test result (OR 1.58, 95% CI 1.05-2.39) (Banister et al., 2014).

Cervical cancer incidence and mortality rates are higher in African Americans than in European Americans. The reasons for this disparity are not known. They proposed that the longer time to clearance of HR-HPV in African American women leads to increased abnormal Pap tests and contributes to the increased rates of cervical cancer observed in African American women (Banister et al., 2014).

Hans et al. (2012) conducted research to determine and compare the knowledge and attitudes toward human papillomavirus (HPV), HPV vaccine, Pap tests, and cervical cancer among US and Peruvian women. They utilized a convenience sample of 275 US women in Augusta, GA, and 702 Peruvian women living in or near Cusco, Peru. The women completed 22- or 21-item questionnaires to determine their knowledge about HPV, the HPV vaccine, Pap tests, and cervical cancer. Simple logistic regression was used to determine the relationship between location and language on the correct responses. The results of the questionnaire were that US Spanish- (OR = 0.02), Quechua- (OR = 0.05), and Peru Spanish-speaking women (OR = 0.03) were significantly less likely to know that HPV causes cervical cancer compared with US non-Spanish-speaking women. US Spanish- (OR = 10.61, OR = 5.74), Quechua- (OR = 11.08, OR = 9.89), and Peru Spanish-speaking women (OR = 17.25, 14.43) were significantly more likely to be embarrassed and afraid, respectively, to get a Pap test compared with US non-Spanish-speaking women. US Spanish- (OR = 0.11), Quechua- (OR = 0.14), and Peru Spanish-speaking women (OR = 0.11) women were significantly less likely to know the HPV vaccine is safe and effective compared with US non-
Spanish-speaking women. The researchers concluded that education must be implemented to address serious misconceptions and worrisome attitudes toward Pap tests and the HPV vaccine to decrease the rate of cervical cancer in Peru and US Spanish-speaking women.

Cervical Cancer Prevention

This section is a review of the current literature related to cervical cancer prevention. The intent is to develop better understanding of measures used to prevent cervical cancer among African-American women. This section is an overview of cervical cancer prevention that examines prevention, the Papanicolaou (Pap) smear, screenings in general, Human Papillomavirus (HPV) testing, HPV vaccination, health professionals obligations, and previous prevention efforts relating to the Cytology Proficiency Improvement Act of 2008 (H.R. 1237) and the National Breast and Cervical Cancer Early Detection Program Reauthorization Act of 2007 (H.R. 1132). Preventative health care is participating in activities with an aim of preventing a disease (Burns, 1992).

Cervical cancer is one of the most preventable types of cancer. This is because one can mostly control the risk factors. The Pap test is a highly effective screening test, and there is an approved vaccine to prevent some of the most common types of the human papillomavirus (HPV). A test for HPV provides an added tool to screen for early signs of infection when treatment options are most effective (Women’s Cancer Network, 2012).
As discussed by Castle et al. (2011), cervical cytology, first with the Papanicolaou (Pap) smear and now with liquid-based cytology, has been the traditional method for cervical cancer screening in developed countries. Since cytology-based programs were introduced in the mid-20th century, rates of cervical cancer have decreased substantially wherever these screening programs have been successfully implemented. In the USA, cancer of the cervix is fairly uncommon, with an estimated 12,200 new cases and 4,210 related deaths occurring in 2010. Despite their success, cytology-based screening programs are now widely recognized as inefficient because of the low sensitivity of one screen and, therefore, many repeat screens are needed during a lifetime to achieve programmatic sensitivity. The US screening and prevention programs costs about US $4 billion annually.

As further discussed by Castle et al. (2011), as a consequence, more efficient screening methods are desirable from a comparative performance and cost-effective perspective. Human papillomavirus (HPV) DNA testing, because of its greater sensitivity for cervical pre-cancer and cancer than cytology with one screen, provides lead-time detection of precancerous lesions. In turn, early detection reduces the future risk of cervical cancer and related mortality, thereby providing greater reassurance for screen-negative women than can be offered by cytology; as such, HPV testing permits a safe extension of screening intervals. The increased sensitivity of HPV testing over cytology also applies to the detection of glandular cancer (adenocarcinoma) and its precursor (adenocarcinoma in situ), which is increasingly important because of the rise in adenocarcinoma rates in the USA, Canada, and Europe. Thus, a switch to HPV
testing, either alone or in conjunction with cytology (co-testing), could provide a safer, more efficient screening program.

Regular Pap screening, beginning at age 21, can detect problems of the cervix that are related to HPV infection before cancer develops. And now vaccines can provide protection against the HPV virus types that cause 70% of cervical cancer. If you never get exposed to HPV, you’ll be at extremely low risk for cervical cancer. But, the only sure protection from HPV is lifelong abstinence. Regular condom use can also help prevent spread of HPV infection (Women’s Cancer Network, 2012).

According to Centers for Disease Control and Prevention (2012), there are ways to prevent the possible health effects of HPV, including the two most common problems which are genital warts and cervical cancer. There are two vaccines (Cervarix® and Gardasil®) that can protect women against most cervical cancers. Gardasil® is also available to protect against most genital warts in males and females. Cervical cancer can also be prevented with routine cervical cancer screening and follow-up of abnormal results. The Pap test can find abnormal cells on the cervix so that they can be removed before cancer develops. An HPV DNA test, which can find HPV on a woman’s cervix, may also be used with a Pap test in certain cases. Even women who got the vaccine when they were younger need regular cervical cancer screening because the vaccine protects against most, but not all, cervical cancers. It is best to talk with your doctor about a Pap test schedule that takes into account your personal risk factors.

Human papillomavirus (HPV) types cause approximately 70% of cervical cancer worldwide. Two vaccines have been recently evaluated in randomized controlled trials: the bivalent vaccine for HPV 16 and 18 (Cervarix, GlaxoSmithKline Biologicals,
Rixensart, Belgium) and the quadrivalent vaccine for HPV 6, 11, 16, and 18 (Gardasil, Merck and Co, Inc., and Whitehouse Station, NJ).

HPV vaccines are prepared from virus-like particles (VLPs), produced by recombinant technology. They do not contain any live biological product or DNA and, therefore, are non-infectious. A quadrivalent vaccine, containing VLPs related to HPV genotypes 6, 11, 16, and 18, has been licensed, and as well as a bivalent vaccine, containing VLPs related to HPV genotypes 16 and 18 (World Health Organization, 2006).

In women who have no evidence of past or current infection with vaccine-related HPV genotypes, both vaccines give over 90% protection against persistent HPV infection with those genotypes. The quadrivalent vaccine has shown 100% protection (95% confidence interval [CI]: 92.9–100) against moderate or severe precancerous lesions associated with HPV 16 or 18. Results from a phase II trial of the bivalent vaccine, which included 1,113 women, showed an efficacy of 100% (95% CI: −7.7–100) against moderate precancerous cervical lesions (World Health Organization, 2006).

The vaccines are designed to prevent infection and disease due to their respective genotypes, and are not designed to treat persons who have already been infected with them. The vaccines are given as a series of three 0.5-ml intramuscular injections over a six-month period. HPV vaccines induce high levels of serum antibodies in virtually all vaccinated individuals and are generally well tolerated. Adverse events at the injection site (pain, erythema and oedema) occur more often in vaccine recipients than controls, but the incidence of serious adverse events (SAEs) was
not significantly higher among vaccine recipients in any of the trials (World Health Organization, 2006).

Stanley (2007) study discusses that sexually transmitted human papillomavirus (HPV) infections are the major cause of genital warts and cervical cancer and are a contributing factor in the development of other types of anogenital cancers. There is a higher risk of HPV infection with an increasing number of sexual partners. Health education measures aimed at improving the use of condoms, reducing the number of sexual partners and promoting safer sex strategies have been employed with the goal of decreasing the transmission of HPV. Of these intervention strategies, promotion of condom use has been shown to be the most effective. More recently, prophylactic HPV vaccines have been developed with the aim of reducing the burden of HPV-related diseases such as cervical cancer. Two vaccines have been developed: Gardasil®, a quadrivalent vaccine targeting HPV-6, -11, -16 and -18) and Cervarix™, bivalent vaccine which targets HPV-16 and -18. HPV-16 and -18 are most commonly associated with cervical cancer.

Medeiros, Rosa, da Rosa, Bozzetti, and Zanini (2009) performed a systematic review of all randomized controlled trials in which vaccines against HPV were compared with placebo regarding efficacy, safety, and immunogenicity. Six studies met the inclusion criteria, which included 47,236 women. The first objective in this systematic review was to assess vaccine efficacy in the prevention of cytologically and/or histologically proven lesions. And the secondary objective was the evaluation of safety and vaccine immunogenicity. Bivalent and quadrivalent HPV vaccines significantly reduced the rate of lesions in the cervix, vulva, vagina, and anogenital
region, with efficacy of 93% (95% confidence interval [CI], 87-96) and 62% (95% CI, 27-70), respectively, when compared with the control groups according to intention to treat.

In regard to vaccine immunogenicity, there was zero conversion in the group that received the vaccine when compared with the placebo group in the bivalent and quadrivalent vaccines. Prophylactic vaccination can prevent HPV infection in women aged nine to 26 years not previously infected with the HPV subtypes covered by the vaccines. The researchers concluded that a longer follow-up is necessary to evaluate cervical cancer incidence and mortality, a longer follow-up is necessary (Medeiros, Rosa, da Rosa, Bozzetti, & Canini, 2009).

The American College of Obstetrics and Gynecology issued new guidelines in November 2009 which call for less frequent Pap tests. The new schedule for Pap tests includes a first Pap screening test at age 21. Between 21 and 29 years of age, screen every two years. Between 30 and 65-70 years of age, screen every three years in low risk women. Women 30 years of age and older who have three consecutive negative Pap tests and who are low risk (i.e., have no history of cervical precancerous lesions, are not infected with HIV, are not immuno-compromised, and were not exposed to DES in utero, may extend the interval between Pap tests to every three years. Women who are high risk should be screened more frequently. A conversation with your healthcare provider will determine how frequently this should be. All women should continue to have an annual well woman exam. Women treated in the past for cervical precancerous lesions or cancer should continue annual screening for at least 20 years. Women age 65-70 who have had three or more consecutive negative Pap tests and no abnormal Pap
tests within 10 years, may discontinue Pap tests. Cease screening after hysterectomy for documented benign disease. Continue to screen after hysterectomy for cervical precancerous lesions or cancer and those without documentation of any lesions. If using co-testing (Pap + HPV test) for women over 30 years of age, only do so every three years if Pap and HPV tests are both negative.

The Centers for Disease Control and Prevention (CDC) has information about HPV, cervical cancer, and the vaccines in multiple languages. These customized information campaigns target specific ethnic groups to help raise awareness. Providing these printable educational materials from the CDC help to present the necessary information to parents without offending them (Lee, 2012).

Increasing knowledge about cervical cancer, HPV, and HPV vaccine is a potentially important way to increase vaccination rates. Education intervention targeting groups who have contact with adolescent females (such as parents, healthcare staff, and school staff) will also increase vaccination and prevention rates (Reiter, Stubbs, Panozzo, Whitesell, & Brewer, 2011).

Primary care clinicians will continue to play an important role in cervical cancer prevention with regard to administration of the HPV vaccine and the Papanicolaou test. Preadolescent and young adolescent visits pose a challenge to the successful integration of counseling about cervical cancer prevention in primary care. Counseling strategies that are designed to emphasize a preventive focus while including parents in the discussion at the time of vaccination and that are appropriate to populations with different cultural values and beliefs will help to enhance communication about cervical cancer prevention and the particular role of HPV vaccine (Sussman et al., 2007).
The Cytology Proficiency Improvement Act of 2008 (H.R. 1237) provides standards for quality assurance in screening and evaluation of gynecologic cytology preparations to assure consistent performance by laboratories of valid and reliable cytology services. H.R. 1237's objective is to require the Secretary of Health and Human Services (HHS) to revise national quality assurance standards to include requirements that each clinical laboratory (1) ensure that all individuals involved in screening and interpreting cytological preparations participate annually in an approved continuing medical education (CME) program in gynecologic cytology that provides each participant with gynecologic cytological preparations designed to improve locator, recognition, and interpretive skills; (2) maintain a record of the cytology CME program results for each individual involved in screening and interpreting cytological preparations at the laboratory; (3) provide that the laboratory director shall take into account such results and other performance metrics in reviewing the performance of individuals and, when necessary, identify needs for remedial training or a corrective action plan to improve skills; and (4) submit the CME program results for each individual and, if appropriate, plans for corrective action or remedial training in a timely manner to the laboratory's accrediting organization for purposes of review and on-going monitoring by the accrediting organization, including reviews of the CME program results during on-site inspections of the laboratory.

National Breast and Cervical Cancer Early Detection Program Reauthorization Act of 2007 (H.R. 1132) is to provide waivers relating to grants for preventive health measures with respect to breast and cervical cancers. Established in 1991, the National Breast and Cervical Cancer Early Detection Program (NBCCEDP) provide free and
low-cost breast and cervical cancer screenings to low-income, minority, or uninsured women. Due to Federal clinical guidelines, the program targets women between the ages of 40 to 64 for breast cancer screening and between the ages of 18 to 64 for cervical cancer screening. Services offered by the program include mammograms, clinical breast examinations, Papanikolaou or “Pap” tests, surgical consultations, and diagnostic testing. Administered by CDC, the NBCCEDP operates in all 50 states, four U.S. territories, the District of Columbia, and 13 American Indian and Alaska Native organizations. The NBCCEDP also partners with state, local, and private entities to provide education and outreach services to diverse populations of women. The bill provides an increase in the program’s authorized funding level for fiscal years 2008 through 2012 (NBCCEDP, 2007).

Research indicates that racial and ethnic minority women are less likely to have access to information about breast or cervical cancer or the financial resources to pay for important health services. This makes over half of all women screened by the program are ethnic and racial minorities. Since 1991, the NBCCEDP has served over 2.5 million women, provided over 5.8 million screening examinations, including more than 2.8 million mammograms, and diagnosed more than 22,000 breast cancers and 1,500 cervical cancers. The NBCCEDP performs screening on more than 600,000 women annually (NBCCEDP, 2007).

Cervical Cancer Vaccination

This section is a review of the current literature related to cervical cancer vaccination. The objective is to increase knowledge about the two types of vaccines
approved by the Food and Drug Administration. This section is an overview of Gardasil® and Cervarix® as it relates to their requirements, recommended usage, and its particulates.

Cervical Cancer and HPV vaccines can help prevent infection from both high risk types that can lead to cervical cancer and low risk types that lead to genital warts. HPV vaccines are recommended for girls ages 11-12. Catch up vaccination is recommended for girls and young women ages 13-26 who have not been previously vaccinated (American Social Health Association, 2012).

Summarized guidelines for HPV vaccination are recommended for all 11 and 12 year old girls, the vaccination series can be started for girls as early as age nine. Ideally, the vaccine should be given before first sexual contact, but females up to age 26 who are sexually active should still be vaccinated, and vaccination is recommended for girls and women ages 13 to 26 who have not been previously vaccinated. However, a decision about whether to vaccinate a woman age 19 to 26 should be made based on an informed discussion between the woman and her healthcare provider regarding her risk of previous HPV exposure and potential benefit from vaccination (Women’s Cancer Network, 2012).

There are two types of HPV vaccines currently available which are Gardasil® and Cervarix®. Gardasil® is available for both men and women. Developed by Merck, Gardasil® is close to 100% effective at preventing infection associated with HPV types 6 and 11 (types associated with 90% of all genital warts) and types 16 and 18 (types associated with 70% of all cervical cancers, as well as many vulvar and vaginal cancers). Cervarix® developed by Glaxo SmithKline (GSK) is a vaccine just for
women. This vaccine is also close to 100% effective in preventing infection associated with HPV types 16 and 18 (associated with 70% of all cervical cancers). Studies suggest that Cervarix® offers cross protection against other high risks HPV types (American Social Health Association, 2012).

In 2006, the Food and Drug Administration (FDA) licensed Gardasil® for use with females ages nine to 26 for the prevention cervical pre-cancers and cancers, vulvar and vaginal pre-cancers, and genital warts. In 2009, the FDA approved Gardasil® for the prevention of genital warts in males ages nine to 26 (ashastd.org, 2012). As of November 2006, for those who qualify, Gardasil® is also available through the federal Vaccines for Children (VFC) program. The VFC program creates a federal entitlement to immunization services for children aged 18 and under who are Medicaid eligible, uninsured, underinsured receiving immunizations through a Federally Qualified Health Center or Rural Health Clinic, Native American or Alaska Native (American Social Health Association, 2012).

Gardasil® is administered in three doses (dose one, followed in two months by dose two, and four months later by dose three) and is safe and effective. The studies on which FDA approval was based identified only minor pain at the injection site as a common side effect. The vaccine confers almost 100% protection against new infections of the target HPV strains. Immunization of Gardasil® has shown to be effective for five years; a booster shot may eventually be required to sustain protection. Because the vaccine does not target all cervical cancer-causing strains of HPV, Pap smears will continue to be recommended to sexually active females (Stewart, A., 2007).
According to Gamble, Klosky, Parra, and Randolph (2009), the prophylactic quadrivalent vaccine, such as Gardasil®, only protects against four HPV types and is not therapeutic (does not treat HPV infections or cervical cancer), it alone will not eliminate cervical cancer. Continued cervical cancer screenings are recommended. The projected benefits of mass HPV vaccination will estimate a potential reduction of cervical cancer risk by 70% with the vaccine's use over many decades. This decline will be dependent on the number of carcinogenic HPV types targeted by the vaccine, durability of protection, degree of vaccination coverage of the at-risk population, and whether the medical community and the public continue to follow recommended screening guidelines.

Chesson, Ekwueme, Saraiya, and Markowitz (2008) research was a simplified model, based on the current economic and health effects of human papillomavirus (HPV), to estimate the cost-effectiveness of HPV vaccination of 12-year-old girls in the United States. Under base-case parameter values, the estimated cost per quality-adjusted life year gained by vaccination in the context of current cervical cancer screening practices in the United States ranged from $3,906 to $14,723 (2005 US dollars).

Chesson et al. (2008) stated this cost was contingent on factors such as whether herd immunity effects were assumed; the types of HPV targeted by the vaccine; and whether the benefits of preventing anal, vaginal, vulvar, and oropharyngeal cancers were included. Their results of the simplified model were consistent with published studies based on more complex models when key assumptions were similar. This consistency reassures that models of varying complexity will be essential tools for policy makers in the development of optimal HPV vaccination strategies.
Brisson, Van de Velde, DeWals, and Boily's (2007) research focused on estimating the number needed to vaccinate to prevent HPV-related diseases and death. They utilized a cohort model of the natural history of HPV infection. Model simulations were based on 209 different parameter sets that reproduced Canadian HPV type-specific data for infection, cervical intraepithelial neoplasia, cervical cancer and genital warts. The number needed to vaccinate was calculated as the number of women who would need to be vaccinated to prevent an HPV-related event during their lifetime.

Their research results were among 12-year-old girls. It was estimated that the number needed to vaccinate to prevent an episode of genital warts would be 8 (80% credibility interval [CrI] 5–15) and a case of cervical cancer 324 (80% CrI 195–757). These estimates were based on the assumption that the vaccine procures lifelong protection and that its efficacy is 95%. If vaccine protection is assumed to wane at 3% per year, the predicted number needed to vaccinate would increase to 14 (80% CrI 6–18) and 9,080 (80% CrI 1040–does not prevent), respectively. The latter number would be greatly reduced with the addition of a booster dose, to 480 (80% CrI 254–1572) (Brisson, Van de Velde, DeWals, & Boily, 2007).

As interpreted by Brisson et al. (2007), their model predictions suggest that vaccination with the currently available HPV vaccine may significantly reduce the incidence of genital warts, cervical intraepithelial neoplasia and cervical cancer. However, the benefits (particularly in terms of cervical cancer reduction) are highly dependent on the duration of vaccine protection.
Cervical Cancer Barriers

This section is an analysis of the current literature related to cervical cancer barriers. The intent is to enhance the awareness around African-American females' barriers to cervical cancer prevention. This section is an overview of cervical cancer barriers. The barriers that have been identified in the literature and that will be reviewed in this section include knowledge about cervical cancer, perceived susceptibility of obtaining cervical cancer and HPV, and attitudes towards screening measures.

Bartlett and Peterson (2011) conducted a comprehensive literature review to identify barriers and facilitators, from the parents'/guardians' and primary care providers' perspective, associated with the uptake of HPV vaccine among adolescent females. Fourteen peer-review articles revealed that 37% of adolescent females, ages nine to 17 years, initiated the HPV vaccine, and compared to the national average of 13 to 15 years olds which was 50%. Their research included parents'/guardians’ knowledge, perceptions, and attitudes toward the HPV disease and the vaccine, along with the convenience in receiving the vaccine. Six of the studies reported that HPV vaccine initiation was highly likely if the parents/guardians had received a doctor’s recommendation. Learning what interventions school nurses currently utilized could positively affect the HPV vaccine uptake and completion rates by other nursing disciplines.

Daley, Beaty, Markowitz, and Dickinson (2006) conducted a study with the objective of determining physician characteristics, knowledge, and attitudes associated with an intention to recommend human papillomavirus vaccination. A cross-sectional survey was administered to 431 pediatricians from a random sample of American
Academy of Pediatrics members. The population was intended to be a representative of the organization's membership with respect to urban/rural location, practice type, and region. The survey was conducted before human papillomavirus vaccine licensure between the months of August and October 2005. The survey focused on a candidate quadrivalent human papillomavirus vaccine and a range of potential vaccination recommendations with the intention to recommend the vaccine to young adolescent females between the ages of 10 and 12. The survey response rate was 68%. The sample of pediatricians expressed a high level of acceptance of human papillomavirus vaccination in older adolescent females, less than one half anticipated giving HPV vaccines to younger female patients.

The introduction of HPV vaccination has been accompanied with varying levels of publicity in the media and materials produced by charities, government organizations, and pharmaceutical companies, distributed via visual and print media and the internet. Before the introduction of the HPV vaccine, population-representative surveys suggested that around 25%–50% of women had heard of HPV. Other studies with specific sub-groups of the population suggested a wide range of HPV awareness, with levels as low as 13% among adolescents and as high as 93% in clinic-based samples. Studies suggested that awareness of HPV was highest among women and those from high socio-economic backgrounds. Since the introduction of the HPV vaccination, awareness of HPV seems to have increased, particularly among parents. In particular, the sexually transmitted nature of the virus and its potential to cause cervical cancer are the most widely known facts (Marlow, Zimet, McCaffery, Ostini, & Waller, 2012).
Gerend, Shepherd, and Lustria (2013) investigated whether tailoring intervention materials to young adult women's perceived barriers to HPV vaccination—a known psychosocial predictor of vaccine uptake—would increase women's intentions to receive the HPV vaccine. Young adult women (N = 94; aged 18-26 years) who had not been vaccinated against HPV were randomly assigned to read either a nontailored message about HPV vaccination or a message that was individually tailored to participants' perceived barriers to HPV vaccine uptake (e.g., safety concerns, cost, and not sexually active). Participants' intentions to receive the HPV vaccine in the next year were assessed before and after delivery of the intervention and served as the primary outcome variable.

Gerend et al. (2013) results revealed that the most commonly selected barrier and primary reason for not getting vaccinated was concern about vaccine adverse effects (endorsed by 55%). Knowledge about HPV vaccination increased after exposure to the intervention but did not differ by experimental condition. Although HPV vaccination intentions increased from pretest to posttest in both conditions, participants in the tailored condition reported greater increases in intentions than did participants in the nontailored condition (F1,90 = 4.02, P = 0.048, partial η = 0.043). These findings suggest that tailoring intervention materials to women's individual barriers is a potentially promising strategy for increasing HPV vaccination among young adult women.

Licht et al. (2010) conducted a study to assess HPV vaccination rates and to examine whether knowledge and risk perceptions regarding HPV were associated with the reported use of the HPV vaccine among female college students. Their study utilized
a cross-sectional design of 406 women; aged 18-26 years were recruited at two public universities and completed a self-administered survey. Respondents who reported having received at least one dose of HPV vaccine were classified as "vaccinated" (n=177, 43.6%). Responses, stratified by the receipt of HPV vaccine, were compared using descriptive statistics and multivariate models.

Licht et al. (2010) concluded, based on multivariate logistic regression modeling, 18-year-old women were approximately four times more likely to report use of the HPV vaccine compared with respondents age 19-26 years. Respondents who correctly indicated that HPV caused genital warts were 1.85 times more likely (adjusted odds ratio (OR) 1.85, 95% CI 1.20 to 2.93) to have received at least one HPV vaccine. African American and Asian women were each less likely to be vaccinated compared with white women. Risk perception was not significantly associated with vaccine uptake, however, the majority of respondents failed accurately to recognize their high risk of both acquiring and transmitting HPV. These findings suggest knowledge deficits and misperceptions about HPV risk as potential themes for educational campaigns encouraging the greater use of the preventive HPV vaccine among this subgroup.

Mather, McCaffery, and Juraskova (2012) focused a study to investigate whether vaccinated and unvaccinated women differ in their (i) knowledge of cervical screening guidelines, (ii) perceived vulnerability to cervical cancer, (iii) cervical screening intentions and uptake, and (iv) attitudes to and engagement in safe sexual behavior. Their study was based on the premises that women vaccinated against HPV may be less likely to undergo cervical cancer screening and engage in safe sexual behavior. The human papillomavirus (HPV) vaccine has the potential to greatly reduce the incidence
of cervical cancer by protecting against HPV infections responsible for 70% of cervical cancer diagnoses.

Mather et al. (2012) study participants included 193 female university students (119 vaccine recipients and 74 vaccine non-recipients) who completed online self-report questionnaires. Of all the assessed outcomes, attitudes to safe sexual behavior were the only significant findings related to vaccination status (p<.001), such that vaccinated women held more positive attitudes to practicing safe sexual behavior. Less than 5% of participants correctly identified screening guidelines. These findings do not support previous research concluding vaccination could have a detrimental impact on screening and sexual behavior. Importantly, results highlight poor awareness of screening guidelines, poor levels of consistent condom use (50%) amongst those sexually active and low uptakes of screening (42%) amongst those eligible to be screened.

Teitelman et al. (2011) had a study that focused on learning more about human papilloma virus (HPV) knowledge and vaccination among teens and young women age 13 to 26 years from an economically disadvantaged, urban community. The aim of the researchers was to identify common beliefs about HPV vaccine initiation and describe the relationship between attitudes, norms, perceived control, and intention to receive HPV vaccine, drawing from the theory of planned behavior (TPB). They utilized a mixed methods and descriptive design approach. Guided by the TPB, HPV vaccine beliefs were assessed through focus groups. Intention to receive the vaccine, demographic and clinical factors, and theoretical predictor variables (attitudes, norms, and control) were assessed through questionnaires. Participants were economically disadvantaged young women, age 13 to 26 (N = 34).
Specific behavioral, normative, and control beliefs were elicited in focus groups and analyzed using content analysis. Simple and multivariate general linear modeling with adjustment for prognostic demographic and clinical factors was completed to assess the influence of the theoretical predictor variables on the outcome of HPV vaccine initiation. Influential beliefs toward vaccination were identified. Analysis indicated attitudes, norms, and perceived control toward HPV vaccine initiation were highly significant predictors of intent, as was tobacco use; all p’s < .001. Barriers to HPV vaccine initiation were identified, and strong preliminary evidence supports use of the TPB to guide programs to promote urban, economically disadvantaged young women’s intent to begin the HPV vaccine (Teitelman et al., 2011).

Ratanasiripong et al. (2013) conducted a cross-sectional study guided by Ajzen’s Theory of Planned Behavior, aimed to identify factors that influence the decision to obtain an HPV vaccine among college women and to examine the relationships among these factors. An electronic self-administered survey was sent to 3074 college women attending a large, public university in southern California, aged between 18 and 26 years.

Ratanasiripong et al. (2013) study results had 384 participants (n = 384; 175 HPV non-vaccinees and 209 HPV vaccinees). Women in this study knew that a Pap test is still needed after HPV vaccination and that the HPV vaccine does not protect against other Sexually Transmitted Infections. Both non-vaccinees and vaccinees had positive attitudes about mandating HPV vaccine. Knowledge and attitudes toward the vaccine were not directly linked to the outcome predictors – intention to obtain the vaccine and vaccine uptake. Attitude about receiving HPV vaccine, subjective norms (complying
with the expectations of others), and perceived behavioral control were correlated with the outcome predictors. Subjective norms consistently predicted intention to obtain HPV vaccine and vaccine uptake.

Knowledge about Cervical Cancer

Knowledge and understanding of HPV infection and vaccination are important factors in insuring informed decisions. However HPV is complicated and does not fit neatly with lay understanding of cancer or other sexually transmitted infections (STIs). The infection itself is very common, yet its serious consequences (i.e. cancers) are rare. It usually clears spontaneously or becomes undetectable, yet this is not always the case. Risk of HPV can be dramatically reduced using condoms, yet they are not as protective against HPV as they are against other STIs (Marlow et al., 2012).

Gerend and Magloire's (2008) piloted a study that assessed current levels and correlates of awareness, knowledge, and beliefs about human papillomavirus (HPV) in a racially diverse sample of young adults. Other correlates of interest in HPV education and the HPV vaccine. Students 18–26 years of age from two southeastern universities (including a historically black university) completed a survey assessing demographic characteristics, sexual history, awareness and knowledge of HPV, HPV-related beliefs (perceived risk of HPV infection, perceived shame associated with HPV infection), interest in learning more about HPV, and interest in the HPV vaccine (women only). The two schools were Florida State University and Florida Agricultural and Mechanical University (a historically black university). Of the 124 students surveyed, more than 75% of the sample had heard of HPV.
Although some misunderstandings were observed, HPV knowledge was relatively high. Women reported greater awareness and knowledge of HPV than did men. Higher perceptions of risk were observed among sexually active participants and those with multiple sexual partners. Younger participants, men, and those with less HPV knowledge indicated they would feel more ashamed if diagnosed with HPV. Black/African-American and sexually active participants reported greater interest in HPV education. Greater interest in the HPV vaccine was observed among women who were sexually active, had multiple sexual partners, and felt vulnerable to HPV infection. It was concluded that awareness of HPV may be increasing, yet many misconceptions remain. Findings also suggest that continued efforts are needed to promote further understanding of HPV infection, the HPV vaccine, and the importance of routine cervical screening (Gerend & Magloire, 2008).

Marlow et al. (2012) completed a research study on the awareness and knowledge of HPV, and HPV vaccination among men and women in the US, UK and Australia. The study aimed to (i) explore differences in awareness of HPV and knowledge of HPV between the US, UK and Australia, (ii) consider whether socio-demographic predictors of knowledge are similar across the three countries, and (iii) identify gaps in knowledge. Participants were recruited through international online panels managed by Survey Sampling International (SSI). Panel members are individuals who have signed up to take part in online research studies in return for small rewards (e.g., air miles).

At the time of the present survey there were 236,088 (UK), 1,790,981 (US), and 80,249 (Australian) members on the panels associated with those three countries.
Samples of participants were invited to take part in the present study. The samples were structured to reflect the demographic characteristics of the country in terms of gender, age and location. Participants were sent a generic recruitment email (Subject: We want your opinion; email text: exciting new survey opportunity! We appreciate your participation. Please click below). When participants clicked on the link in the email they were directed to an online survey titled “what do you know about HPV?” The target sample was 800 participants from each country in the age range 18–70 years. Quotas were set to ensure equal numbers of men/women completed the survey.

Participants were invited in waves until the recruitment target was met. Women had higher awareness of HPV than men and were more likely to have heard of the vaccine (Marlow et al., 2012).

Current strategies mostly involve offering and marketing the vaccine to women only. Education was significantly associated with awareness of HPV. Other demographic variables associated with awareness varied by country and gender.

Awareness of HPV in general and HPV vaccination was higher in the US than in Australia and the UK. One possible explanation for this is the abundance of publicity about HPV produced by the pharmaceutical industry with drug company adverts being the most common source for having heard of HPV in the US. Most participants who had heard of HPV knew its association with cervical cancer (77–79% of men and 85–93% of women) and that HPV is sexually transmitted (70–74% of men and 73–76% of women), (Marlow et al., 2012).

Information campaigns have successfully raised awareness of some aspects of HPV knowledge as pre-vaccine introduction fewer respondents were reported to know
these facts. Knowledge of other aspects regarding HPV and HPV vaccination could still be greatly improved. For example, more than half of those who had heard of HPV did not know: HPV can cause genital warts; most sexually active people will get HPV at some point in their life; or HPV does not usually need treatment and more than half of those who had heard of HPV vaccine did not know that it requires three doses and is most effective if given to people who have never had sex (Marlow et al., 2012).

In addition, more than a third of participants responded incorrectly to items about the ability for condoms to reduce the risk of HPV and about men getting HPV as well as women. There were no inter-country differences in correctly identifying the statement HPV can cause genital warts as true, despite the fact that both the US and Australia offer Gardasil and at the time of data collection the UK only offered Cervarix. Confusion about whether HPV is related to HIV/AIDS was also common, although this item has been found to correlate poorly with other aspects of HPV knowledge, so should perhaps be interpreted with caution. Most women were aware that vaccination does not rule out the need for future cervical screening (83–92% across the three countries) and yet 19–34% of women were uninformed about the fact that it is possible to develop cervical cancer despite receiving the vaccine. The discrepancy was particularly marked among Australian women. The finding suggests that messages about the need for future screening may need to be underpinned with clearer information about the limitations of the vaccine—i.e., that it does not prevent all cervical cancers (Marlow et al., 2012).

US women were more likely to know about the link between HPV and cervical cancer, that HPV is common and that there are different types of HPV than women in the UK and Australia. These were the three messages covered in the Gardasil campaigns
“tell someone” (about HPV) and “one less” (with the message that by being vaccinated, you could be one woman less affected by cervical cancer). The campaigns included TV advertising in the US and our findings suggest that these advertisements did more than simply raise awareness. However, when asked about the availability of the vaccine in their country men and women from the US got fewer questions correct (Marlow et al., 2012).

There are several explanations for why knowledge about vaccine availability may be poor in the US. Firstly, as availability of the vaccine varies by state, this information is unlikely to be publicized on a national level and actively searching for vaccine availability information is likely to be necessary. Secondly, while pharmaceutical advertisements seem to have helped raise awareness of HPV in the US, even those who recall having seen DTC HPV adverts found it hard to understand and recall what they had seen. Those who used advertisements as their only source of information about HPV had lower knowledge than those who sought additional information. While fewer men and women have heard of HPV in the UK and Australia, those who have may feasibly be those who the vaccine is most applicable to and therefore know more about its availability (Marlow et al., 2012).

Gottleib et al. (2009) conducted a study of 889 parents of 10-18 year old girls in North Carolina. They found that the parents main reasons for not having their daughters vaccinated including needing more information about cervical cancer and the vaccine, believing their daughters were too young to be at risk for HPV infection and not having visited the doctor where the vaccine can be provided. Knowledge gained from this study can help inform future educational interventions to improve HPV vaccine uptake. Their
results suggest that accurately describing the risks of cervical cancer versus benefits to HPV vaccination and risks of HPV infection during adolescence and young adulthood may be effective for educational intervention.

Many young women have never heard of cervical cancer, and limited knowledge about HPV symptoms and Pap testing has been noted among adolescents. Adolescent knowledge of HPV appears to be influenced by physicians and health educators, peer groups, and media. Young women familiar with HPV and the vaccine have reported receiving their information at school, from a doctor, and/or via television, with most receiving information from school classes and media sources (Gottleib et al., 2009).

Cates, Brewer, Fazekas, Mitchell, and Smith (2009) completed a study to identify racial differences in knowledge and attitudes about HPV, cervical cancer, and the HPV vaccine that may influence uptake of the vaccine. They interviewed women (91 black and 47 white) living in a rural area of the Southern United States in 2006. Analyses was controlled for socioeconomic status, age, and recruitment location.

Cates et al. (2009) found that more white respondents had heard of HPV than had black respondents (57% vs 24%, P < .001), and whites had higher HPV knowledge (42% vs 29% correct responses, P < .05). Blacks were less likely than whites to think that cervical cancer would be a serious threat to their daughters' health (75% vs 96%, P < .001). More blacks than whites thought the ideal age to receive the vaccine was 17 years or older (63% vs 40%, P < .05). Blacks reported lower intentions to vaccinate their daughters than whites (M = 4.14 vs 4.55, P < .05 in unadjusted analyses, but not statistically significant in adjusted analyses). It was concluded that black and white
respondents had different awareness, knowledge, and beliefs related to the HPV vaccine.

**Perceived Susceptibility**

According to Stewart (2007), surveys have generally shown that young women are very interested in getting the HPV vaccine, that parts are willing to have their children vaccinated, and that clinicians are inclined to offer the vaccine in their practices. Both the American College of Obstetricians and Gynecologists and the American Academy of Pediatrics endorse the use of the vaccine by their members. Experts emphasize the importance of creating immunization opportunities. Adolescents, especially from minority and low-income communities have poorer access to care than any other population in the United States. There are still concerns about individual liberties, patient autonomy, and parental rights, and attitudes towards adolescent sexuality, generally underlie objections to an HPV vaccine mandate (Stewart, 2007).

Mills, Vanderpool, and Crosby (2011) conducted a study to explore whether sexually related behaviors predict refusal of the human papillomavirus (HPV) vaccine among a sample of women aged 18-26 in Appalachian Kentucky. Using a convenience sample, young women attending health clinics and a community college in southeastern Kentucky were recruited to participate in a Women’s Health Study. After completing a questionnaire, women received a free voucher for the three-dose HPV vaccine series.

Completion of dose one served as the outcome variable. Women with a history of an abnormal Pap test were almost two times more likely to decline the HPV vaccine (adjusted odds ratio [AOR] 1.91, 95% confidence interval [CI] 1.14-3.20, p=0.015), and
women who reported they had never had a Pap test were four times more likely to 
decline the vaccine (AOR 4.02, 95% CI 1.13-14.32, p=0.032). Women engaging in 
mutual masturbation were nearly two times more likely to decline the free vaccine 
(AOR 1.91, 95% CI 1.17-3.10, p=0.009). Use of hormonal birth control showed a 
protective effect against refusal of the free HPV vaccine (AOR 0.593, 95% CI 0.44-
0.80, p=0.001) (Mills, Vanderpool, & Crosby, 2011).

Mills et al. (2011) concluded in their research that among their sample of 
Appalachian women, those engaging in behaviors that increase their risk for HPV 
infection were more likely to refuse the vaccine. Conversely, those women engaging in 
protective health behaviors were more likely to accept the vaccine. These findings 
suggest that those women not being vaccinated may be the very group most likely to 
benefit from vaccination. Cervical cancer prevention programs need to be creative in 
efforts to reach young women most in need of the vaccine based on a higher profile of 
sexually related behaviors and the proxy measure of this risk (having an abnormal Pap 
test result).

Cervical cancer prevention has primarily relied on screening paradigms but 
vaccination against human papillomavirus (HPV), the cause of the disease, is a primary 
preventative measure that has been recommended by all cervical cancer screening 
stakeholders. Guidelines for vaccination are developed by national advisory groups, but 
successful implementation requires a supportive infrastructure and the cooperation of 
providers, clinicians, and patients. HPV vaccination has been available in the United 
States (US) since 2006 and screening practices have been updated to also include HPV 
genotyping. However, many clinicians fail to adhere to the guidelines for HPV testing
(and HPV co-testing) as part of cervical cancer screening, and vaccination coverage has been poor among females aged 11 and 12, the group for which vaccination is recommended by all organizations (Herzog, Huh, & Einstein, 2010).

Gamble et al. (2009) stated that it is helpful to investigate a family’s decision toward childhood immunizations in order to understand the decision to accept the HPV vaccine. Factors such as health care providers’ attitudes and recommendations, as well as parent and adolescent beliefs and attitudes remain consistent domains for influence across the general vaccination literature.

Decisions to immunize one’s child may also be influenced by socio-environmental factors (i.e., cultural beliefs), and parent-specific or personal factors. Additional influences on decision making are familial interface with the health care system (e.g., federal and states mandates for school enrollment), media influences, peer norms, as well as physical environment of health (e.g., background prevalence of a vaccine-preventable disease. Parents’ acceptance of general childhood vaccines may be influenced by inaccurate beliefs, such as the worry that the measles, mumps, rubella vaccine causes autism that has led some parents to question whether to vaccinate their children. Vaccines success rates also influence parent’s susceptibility to vaccinate their children (Gamble, Klosky, Parra, & Randolph, 2009).

To achieve HPV vaccine acceptance, Gamble et al. (2009) suggest that it is necessary to evaluate current perceptions of vaccine effectiveness and provide accurate HPV-specific educational information because HPV vaccine acceptability is influenced by the same theoretical constructs that have been crucial to the uptake of other vaccines.
Vanderpool, Casey, and Crosby (2011) conducted exploratory research to determine associations between HPV-related risk perceptions and uptake of free Gardasil offered to rural Appalachian women ages 18-26 attending regional health clinics. Young women (N = 247) were recruited from health clinics in Southeastern, Kentucky from March 2008 through September 2009. After completing a brief interview assessing seven HPV-related risk perceptions, women received a HPV vaccine voucher which provided the entire three-dose vaccine series free of charge. Whether women redeemed the voucher for dose one of Gardasil served as the study outcome variable.

Hierarchical logistic regression was used to estimate the independent effects of each predictor variable on vaccine uptake. Less than 50% redeemed the voucher to receive dose one of the HPV vaccine. Five of the seven variables significantly predicted uptake. In a controlled analysis, only two predictors remained significant “in general, vaccines are a good thing” (P = .02) and “I believe that getting the vaccine will be painful” (P = .03). The remaining three predictor variables (worry about having HPV [P = .07], HPV is serious enough for vaccination [P = .43], and not sure vaccine is safe [P = .22]) were not significant in the model. Health promotion programs designed for this population may enhance HPV vaccine uptake by creating more realistic perceptions about the inherent value of vaccines and by improving perceptions relative to injection pain (Vanderpool, Casey, & Crosby, 2011).

Cummings et al. (2012) study examines the impact of HPV vaccination on subsequent HPV detection and sexual behaviors among urban adolescents in a clinical setting. A cohort of adolescent women, ages 14 to 17, were recruited prospectively and
matched to historical controls to assess the impact of HPV vaccination. All women completed the same questionnaire and face-to-face interview that assessed sexual behaviors; all provided a clinician or self-collected vaginal swab that was used to test for sexually transmitted infections, including HPV. Logistic regression models, incorporating random pair effects, were used to assess the impact of the HPV vaccine on HPV detection and sexual behaviors between the two groups.

Cummings et al. (2012) study results revealed that each woman recruited (N=75) was matched to two historical controls (HC); most of the recruited women (89.3%) had received one or more doses of the HPV vaccine. At enrollment, detection of quadrivalent vaccine types (HPV 6, 11, 16 and 18) was significantly less in the recruited group (5.3%) as compared to the HC (24%): OR=5.6 (CI=1.9, 16.5), p=.002. Adolescent women in the HC had a 9.5 times greater odds of HPV infection when the analysis was adjusted to compare those who had 2 or more vaccine doses to their matched controls. The only behavioral difference found was that the recruited women used condoms more frequently. This study demonstrates that HPV vaccination was associated with fewer vaccinetype HPV infections despite incomplete vaccination and high risk sexual behaviors. These data also suggest that sexual behaviors were not altered because of the vaccine.

Marchand, Glenn, and Bastani’s (2012) study assessed HPV vaccination and its correlates among culturally diverse 18–26 year-old community college women in Los Angeles. Specific research questions were (1) What proportion of respondents have initiated the HPV vaccine, and what proportion have completed the three-dose series? (2) What demographic (e.g., age, ethnicity), psychosocial (e.g., vaccine-related beliefs,
perceived social norms), and health care-related variables (e.g., health insurance status, provider recommendation, health care trust and satisfaction) are associated with vaccine initiation for this sample? Participants came from a community college in central Los Angeles who were all female students between 18 and 26. An anonymous web-based survey assessed number of HPV vaccine doses received as well as demographic information, HPV- and HPV vaccine-related knowledge, attitudes, and behavior, perceived social norms, provider and health care system factors, sexual behavior, cervical health, and mother-daughter communication about sex. Analyses were conducted using 178 surveys.

The results were based on a multivariate logistic regression tested the relationships of statistically significant bivariate predictors to vaccine initiation. It was found that those who initiated the vaccine were younger, more often had a health-related academic major, thought the vaccine to be safer, perceived HPV severity lower, and perceived higher social approval for HPV vaccination than those unvaccinated. All who had initiated the vaccine had a doctor’s recommendation. This researchers suggest that to increase uptake among 18–26-year-old women, research should explore provider interventions to increase vaccine recommendation, and also identify individuals and groups who may have negative beliefs about vaccine safety and efficacy to provide support in vaccine decision-making (Marchand, Glenn, & Bastani, 2012).

**Attitudes Toward Screening Measures**

Parents express concern about the HPV vaccine promotion sexual activity (Lee, 2012). Concerned Women for America (2008) says, “Giving the vaccine to young girls
before they are sexually active provides them with a false sense of security, possibly leading to risky sexual behavior that would not have occurred had the threat of cervical cancer been present” (para. 6).

Vaccination requirements are established on a state-by-state basis; there are no federal mandates. The legal precedent for mandatory vaccinations is the 1907 decision in *Jacobson v Commonwealth of Massachusetts*, when the U. S. Supreme Court upheld a Massachusetts law requiring smallpox vaccinations for adults, declaring that “the police power of State must be held to embrace, at least, such reasonable regulations...as will protect the public health and the public safety” (197 U.S. 11, 25S Ct 358, 1905).

The diphtheria/pertussis/tetanus, measles/mumps/rubella and polio vaccines are almost universally required for children entering school. Exemptions on medical grounds are permitted everywhere. Most states also allow religious exemptions, and 20 provide “personal-belief” exemptions, which vary in their flexibility. States that offer personal belief exemptions, and those that make any exemptions easy to get, have higher rates of unvaccinated children. They also have higher disease rates (Stewart, 2007).

Social movement of some force and visibility has risen in recent years to question the safety and value of vaccines; more than 95% of school-age American children receive the mandated immunizations (Hodge, 2002). Contagious diseases have dropped dramatically as a direct result. A single example: an average of 5000, 5000 children contracted measles in the years before the vaccine was introduced; in 2000, there were 81 cases of measles (Malone & Hinman, 2003).
The HPV Debate: The traditional basis for school immunization mandates is to protect school-age children and the community at large from communicable disease. Public health experts argue for requiring vaccinations because they provide protection not only to vaccinated individuals, but also to the community as a whole. “Heard immunity” occurs when enough people are protected again the disease to slow or halt person-to-person transmission, even to those who are not vaccinated because they slip through the cracks of the medical system or are exempt for medical, religious, or personal reasons. An additional argument for an HPV vaccine mandate tied to school enrollment is the absence of consistent venues for serving adolescents. Adolescents and young adults have poorer access to care than any other population in the United States (Stewart, 2007).

The National Adolescent Health Information Center (2003) states that “a significant minority [of adolescents]-including the uninsured, the poor, some racial/ethnic groups and adolescents with special risk factors-reports having foregone needed care and having unmet health needs” (p. iii). If the HPV vaccine remains voluntary, adolescent in medically underserved communities are less likely to receive it, and another health disparity may emerge between those who have ready access to medical care and those who do not. However, public health concerns must be weighed against bioethical considerations, which generally place paramount value on respect for individual liberties, autonomy, and the need to obtain informed consent for medical treatment (Stewart, 2007).

Gamble et al. (2009) states parental attitudes are attributable to understanding HPV vaccination outcomes. Prior to HPV vaccination approval, parents demonstrate a
poor understanding of HPV (i.e., were not well informed of the vaccine for the virus, reported little to no knowledge of HPV, and were unaware of associations of HPV with Pap testing and cervical cancer); however, parents reported high levels of interest in STI/HPV for their adolescents. Many factors contribute to parental support for/resistance to HPV immunization. Parent socio-demographic variables such as ethnicity, age, education, and religion do not appear to be correlated with acceptance of HPV vaccination. Perceived physician encouragement, HPV-related knowledge, and other parental Health Belief factors appear to be associated with a positive parental attitude toward immunization. The study conducted by Gamble et al. (2009) suggest that some mothers prefer discussing HPV vaccination when discussing cervical cancer and as a vaccine against cancer rather than it being related to sexual intercourse.

Gamble et al. (2009) also mentioned the factors that contribute to parents being opposed to the HPV vaccination. These factors include parental anxiety regarding vaccine safety, conservative religious/cultural views, belief that vaccination encourages sexual activity, specific HPV vaccine and general vaccine matters, moral issues about sexuality, denial of daughter’s risk status, lack of disease-specific knowledge, risk of unknown harmful side effects, and low concern for child’s HPV acquisition. Mothers who have delayed, refused, regretted a previous pediatric immunization have also been less inclined to accept the HPV vaccination.

Decisions to vaccinate against a cervical cancer or an STI are influenced by parental and adolescent attitudes toward sexual behavior, because beliefs about adolescent contraception use, as well as parent-child sexual communication, may affect familial vaccination decisions. Mothers have been found to be the primary
communicators with adolescents on sex-related topics, and are more likely to discuss sexual matters with daughters than sons. This research also suggest that mother-daughter pairs are more likely to discuss topics such as birth control, reproduction, physical and sexual development, and sexual pressures than HIV or AIDS and choosing a sexual partner. Parents who communicate more openly with their adolescents about sexual topics are more likely to discuss contraceptives, and it is crucial to examine what influences parents to discuss sexual topics since HPV is acquired via sexual behavior (Gamble et al., 2009).

Documét et al. (2008) conducted a study that resulted in approaching cultural competence in terms of policy, health care provision, and clinical care. As the U.S. population becomes more diverse and minority populations grow, delays in cancer detection impose increasing burden, not only on individuals and their families, but also on the nation’s economy. To succeed, early detection programs must be culturally competent, meaning that their design includes deliberate modification of health care environments to serve patients of various cultural backgrounds more effectively.

Kobetz et al. (2011) conducted a series of focus groups with Haitian immigrant women in Little Haiti, the predominantly Haitian neighborhood in Miami, Florida, U.S. Focus group questions assessed women’s knowledge and beliefs about cervical cancer and HPV, their opinions of vaccines in general, their knowledge and perceptions of the HPV vaccine specifically and health communications preferences for cervical cancer prevention.

Kobetz et al. (2011) study resulted as follows: among the participants who had heard of HPV, many held misconceptions about virus transmission and did not
understand the role of HPV in the development of cervical cancer. Virtually all participants expressed support for vaccines in general as beneficial for health. Some women had heard of the HPV vaccine, primarily as the result of a contemporary popular media campaign promoting the Gardasil® vaccine. Physician recommendation was commonly mentioned as a reason for vaccination, in addition to having more than one sex partner. Women felt the HPV vaccine was less appropriate for adolescent girls who are presumed as not sexually active. Women indicated a strong preference to obtain health information through trusted sources, such as Haitian physicians, Haitian Community Health Workers, and especially Kreyol-language audiovisual media.

Fazekas, Brewer, and Smith’s (2008) study focused on women from a rural area in North Carolina with elevated rates of cervical cancer to identify predictors of HPV vaccine acceptability for themselves and their daughters. This was due in part because cervical cancer rates in the United States are highest in Southern and rural areas; research on human papillomavirus (HPV) vaccine acceptability has mainly focused on other geographic areas.

Fazekas et al. (2008) findings were based on 146 women completing questionnaires about HPV infection, cervical cancer, and HPV vaccination. The majority (62%) of respondents were African American. Most respondents intended to vaccinate an adolescent daughter against HPV. Older and African American women reported lower vaccination intentions. Higher intentions to vaccinate an adolescent daughter against HPV were associated with knowing more about HPV, believing that HPV infection and cervical cancer are both likely and have negative consequences, and believing that the HPV vaccine is effective against cervical cancer.
Women reported higher intentions to get the HPV vaccine for an adolescent daughter than for themselves. HPV vaccine acceptability for an adolescent daughter was associated with women’s beliefs about their own healthcare needs. These findings on the HPV vaccination decisions of women in North Carolina offer insights that can inform future health communication activities intended to increase vaccination uptake in other high-risk populations of rural Southern women (Fazekas, Brewer, & Smith, 2011).

Dempsey, Cohn, Dalton, and Ruffin (2010) used qualitative methods to assess the reasons why mothers did or did not allow their adolescent daughter to be vaccinated. Characteristics such as child age, perceived access to the vaccine, societal norms, religious background and perceptions about disease severity and susceptibility were all hypothesized to drive uptake of these vaccines among females in the US. It was found that while both groups of mothers perceived both risks and benefits to vaccination, the balance of these two factors differed significantly between the two groups.

In a study of 262 women, 189 were aged 13–26 years, from an urban, hospital-based clinic participated in a follow-up study. Between June and December 2007, six months after they had completed a baseline survey, they were re-contacted to assess receipt of at least one HPV vaccine dose and barriers to receiving the vaccine. They assessed whether demographic factors, gynecological history, and attitudes measured at baseline were associated with vaccination at follow-up using logistic regression (Conroy et al., 2009).

At follow-up, 68 of 189 (36%) had received ≥1 HPV vaccine dose. Factors measured at baseline that predicted vaccination 6 months later included insurance coverage for HPV vaccination (odds ratio [OR] 5.31, 95% confidence interval [CI] 1.61-
17.49) and the belief that one's parents, partners, and clinicians endorsed HPV vaccination (OR 2.21, 95% CI 1.29-3.79); those with a history of an abnormal Pap test were less likely to have received the vaccine (OR 0.30, CI 0.10-0.92). Of the 121 who were unvaccinated, 54 (45%) had not returned to the clinic since the baseline study, 51 (42%) had returned but were not offered vaccine, and 15 (12%) had declined vaccination (Conroy et al., 2009).

This demonstrated that insurance coverage for the vaccine, and a belief that clinicians, parents and/or partners approved of vaccination were associated with significantly higher odds of initiating the vaccine series. Interestingly, those who had a history of abnormal Papanicolaou smears were less likely to get vaccinated in this study than those without this history. It was concluded that interventions to increase HPV vaccination rates in women in the catch-up age group for vaccination should ensure that vaccine costs are covered, promote HPV vaccination as normative, and establish clinic-based systems to prevent missed opportunities for vaccination (Conroy et al., 2009).

Attitudinal barriers to HPV vaccination among college students merits special consideration as these women often have unique vaccination constraints that are not present among other populations. For example, though most women who attend college are of the age where they can self-consent for HPV vaccination, many are still covered under their parents' health care insurance policies. This raises issues of confidentiality since parents often receive itemized bills which would indicate when the HPV vaccine had been provided. College women who are not under their parents insurance frequently have coverage within that college's health system. However, this coverage can vary considerably with regard to HPV vaccines. HPV vaccine utilization in relation to
college student status suggests that access to the vaccine may be easier for college-enrolled women than similarly aged individuals who are not enrolled in college. In addition, personal beliefs are thought to be an important influence of HPV vaccine acceptance among college-age individuals (Dempsey, 2010).

Casey, Crosby, Vanderpool, Dignan, and Bates (2013) conducted a study to identify normative influences predicting initial HPV vaccine uptake among a sample of young women in southeastern Kentucky. Women (N = 495), ages 18 through 26 years, were recruited from clinics and community colleges. After completing a questionnaire, women received a free voucher for HPV vaccination. Whether women redeemed the voucher for Dose 1 served as the primary outcome variable. Hierarchical logistic regression was used to estimate the influence of healthcare providers, friends, mothers, and fathers on vaccine uptake. One-quarter of the total sample (25.9%) received Dose 1. Uptake was higher in the clinic sample (45.1%) than in the college sample (6.9%).

On multivariate analysis, women indicating that their healthcare provider suggested the vaccine, that their friends would “definitely” want them to be vaccinated, and that their fathers would “definitely” want them to receive the vaccine all were 1.6 times more likely to receive Dose 1. Interaction effects occurred between recruitment site (clinic vs. community college) and all three of the normative influences retaining multivariate significance, indicating that the associations only applied to the clinic sample. HPV vaccine interventions may benefit from highlighting paternal endorsement, healthcare provider recommendation, and peer support (Casey, Crosby, Vanderpool, Dignan, & Bates, 2013).
Ferris, Waller, Owen, and Smith (2008) researched to determine correlates of human papillomavirus (HPV) vaccine acceptance in mid-adult women. A convenience sample of 472, mid-adult women, aged 25 years old and older, from the community and medical clinics located in three southern US cities (Atlanta and Augusta, Georgia, and San Antonio, Texas) during the summer of 2006. The participants completed a two-part, 69-item survey that included demographic, knowledge, and behavioral variables as potential correlates of vaccine acceptance. Univariable and multivariable logistic regression models were used to identify correlates for vaccine acceptance. Approximately half were white, married, and younger than 35 years old. Although two thirds had a college degree, only half had a family income of $39,001; 13% were uninsured. Nearly three quarters were in a monogamous sexual relationship, but subjects reported a mean lifetime number of sexual partners of 6.3 (SD, 7.7). Twelve percent had a history of cervical neoplasia.

Ferris et al. (2008) discussed that their study demonstrated a positive age correlation for HPV vaccine acceptance even for women 45 to 49 years old (OR, 7.5; 95% CI, 2.05–27.68). It was stated that the knowledge that HPV causes cervical cancer and the knowledge of being at risk for HPV infection were positive correlates of HPV vaccine acceptance among mid-adult women. These results reinforce the importance of patient education. As such, mid-adult women who are aware of these potential risks will be more interested in being vaccinated. Unfortunately, HPV is not one of the more readily recognized sexually transmitted infections. However, many health care providers are sufficiently knowledgeable about the risks of HPV to appropriately convey this information to their patients. It is suggested that timely education may help minimize
the cost, morbidity, and mortality associated with HPV-related neoplasias. Furthermore, clinicians will need to remain alert to potentially vaccinating the entire family in the future.

Mid-adult women who considered it too late to receive the HPV vaccine were less likely to want it. The researchers did not specifically ask women why they thought it was too late. For many, this may be a false assumption. Simply having a history of an abnormal Papanicolaou test, or even surgery for cervical neoplasia, are not reasons to avoid vaccination. Similarly, a history of genital warts in a partner or themselves is not contraindications to being vaccinated. Other explanations may include same-sex relationships, sexual abstinence, and hysterectomy, but even some of these mid-adult women could potentially benefit from vaccination (Ferris, Waller, Owen, & Smith, 2008).

Ferris, Waller, Dickinson, McCracken, and Goebel’s (2012) study aimed at determining the impact of Pap test compliance and cervical cancer screening intervals on human papillomavirus (HPV) vaccination acceptance. A convenience sample of 499 women 21 to 65 years old completed a 37-question survey in Augusta and Savannah, GA. The survey assessed their knowledge about HPV, cervical cancer, and the HPV vaccine. The questionnaire also determined their Pap test compliance and how longer Pap test intervals would influence their willingness to receive the HPV vaccine. Differences between categorical variables and knowledge scores were examined using \( \chi^2 \) test and unequal-variance t-tests, respectively.

The results revealed that Pap test-noncompliant women were more likely to get the HPV vaccine if they only needed a Pap test every 10 years compared with Pap test-
compliant women (27.6% versus 14.6%, p = .02). A greater number (83.5%) of Pap test-
noncompliant women preferred the HPV vaccine plus every 10-year Pap test option
compared with Pap test-compliant women (31.3%, p < .0001). Most women (87%)
responded that they would likely get the HPV vaccine if it would safely reduce the
frequency of Pap testing (Ferris, Waller, Dickinson, McCracken, & Goebel, 2012).

It was concluded that women are receptive to getting the HPV vaccine in
exchange for longer cervical cancer screening intervals. Moreover, Pap test-
noncompliant women are more likely to get the HPV vaccine if Pap testing was needed
less frequently. Increasing the Pap testing interval may be an excellent method to
improving HPV vaccine acceptance in women at highest risk for cervical cancer (Ferris
et al., 2012).

Muñoz et al. (2010) study concentrated on the impact of the prophylactic vaccine
against human papillomavirus (HPV) types 6, 11, 16, and 18 (HPV6/11/16/18) on all
HPV-associated genital disease in a population that approximates sexually naive women
in that they were “negative to 14 HPV types” and in a mixed population of HPV-
exposed and -unexposed women (intention-to-treat group). This analysis studied 17, 622
women aged 15-26 years who were enrolled in one of two randomized, placebo-
controlled, efficacy trials for the HPV6/11/16/18 vaccine (first patient on December 28,
2001, and studies completed July 31, 2007). Vaccine or placebo was given at day one,
month two, and month six.

In this study all women underwent cervicovaginal sampling and Papanicolaou
(Pap) testing at day one and every six to 12 months thereafter. Outcomes were any
cervical intraepithelial neoplasia; any external anogenital and vaginal lesions; Pap test
abnormalities; and procedures such as colposcopy and definitive therapy. Absolute rates are expressed as women with endpoint per 100 person-years at risk (Muñoz et al., 2010).

Results from this study by Muñoz et al. (2010) showed the average follow-up was 3.6 years (maximum of 4.9 years). In the population that was negative to 14 HPV types, vaccination was up to 100% effective in reducing the risk of HPV16/18-related high-grade cervical, vulvar, and vaginal lesions and of HPV6/11-related genital warts. In the intention-to-treat group, vaccination also statistically significantly reduced the risk of any high-grade cervical lesions (19.0% reduction; rate vaccine = 1.43, rate placebo = 1.76, difference = 0.33, 95% confidence interval [CI] = 0.13 to 0.54), vulvar and vaginal lesions (50.7% reduction; rate vaccine = 0.10, rate placebo = 0.20, difference = 0.10, 95% CI = 0.04 to 0.16), genital warts (62.0% reduction; rate vaccine = 0.44, rate placebo = 1.17, difference = 0.72, 95% CI = 0.58 to 0.87), Pap abnormalities (11.3% reduction; rate vaccine = 10.36, rate placebo = 11.68, difference = 1.32, 95% CI = 0.74 to 1.90), and cervical definitive therapy (23.0% reduction; rate vaccine = 1.97, rate placebo = 2.56, difference = 0.59, 95% CI = 0.35 to 0.83), irrespective of causal HPV type. This concludes that high-coverage HPV vaccination programs among adolescents and young women may result in a rapid reduction of genital warts, cervical cytological abnormalities, and diagnostic and therapeutic procedures.

Wheeler et al. (2009) conducted a study to see if they could predict how HPV vaccination and HPV-based screening will influence cervical cancer prevention. The researchers used the New Mexico Surveillance, Epidemiology, and End Results
Registry to ascertain cases of in situ (n = 1213) and invasive (n = 808) cervical cancer diagnosed during 1985-1999 and 1980-1999, respectively, in the state of New Mexico.

In situ basically means the natural or original position. Invasive means tend to spread (Merriam-Webster, 2014). Wheeler et al. (2009) used cases of clients diagnosed with cervical cancer that was positioned and cases of cervical cancer that was spreading. HPV genotyping was performed using two polymerase chain reaction-based methods on paraffin-embedded tissues from in situ and invasive cancers and on cervical Papanicolaou test specimen from control subjects (ie, women aged 18-40 years attending clinics for routine cervical screening [n = 4007]). Relative risks for cervical cancer were estimated, and factors associated with age at cancer diagnosis and the prevalence of HPV genotypes in cancers were examined.

As noted by Wheeler et al. (2009), the most common HPV genotypes detected in invasive cancers were HPV type 16 (HPV16, 53.2%), HPV18 (13.1%), and HPV45 (6.1%) and those in in situ cancers were HPV16 (56.3%), HPV31 (12.6%), and HPV33 (8.0%). The research conducted by Wheeler et al. (2009), concluded that HPV16 and 18 caused the majority of invasive cervical cancer in this population sample of US women, but the proportion attributable to HPV16 declined over the last 20 years. The age at diagnosis of HPV16- and HPV18-related cancers was five years earlier than that of cancers caused by carcinogenic HPV genotypes other than HPV16 and 18, suggesting that the age at initiation of cervical screening could be delayed in HPV-vaccinated populations.

Dempsey, Fuhrel-Forbis, and Konrath (2014) produced a study about the performance of the Carolina HPV Immunization Attitudes Scale (CHIAS) among young
adult women using an exploratory factor analysis. It is reported that HPV vaccination among young adults in the U.S. is significantly lower than national goals. Compared to adolescents, young adult women have substantially lower HPV vaccine utilization, with national estimates indicating that as of 2012, only 34.5% of women ages 19–28 years had received at least one dose in the three-dose HPV vaccine series.

Dempsey et al. (2014) specified that interventions to improve HPV vaccine utilization among young women have been hindered by limited understanding of the factors that influence vaccine acceptability, intention, and ultimately vaccine utilization among this population.

Dempsey et al. (2014) conducted a cross sectional survey of 139 college-aged women who had not yet having received any doses in the HPV vaccine series. The survey was implemented from October 11, 2011 to November 1, 2012 utilizing the CHIAS. The CHIAS was originally developed for parents in North Carolina making decisions about HPV vaccination for their adolescents. Dempsey et al. (2014) study resulted in 98 (70.5%) participants also completed the six-month follow-up survey. At baseline 41% of respondents were in a current sexual relationship, and nearly all had heard of HPV and knew a vaccine was available. Only a small proportion of respondents indicated they had ever experienced an HPV-related disease (2–5%).

Dempsey et al. (2014) concluded that measures that reliably predict HPV vaccination intention across populations and over time could help facilitate the development of effective interventions to improve HPV vaccine uptake. Their results suggest that young women may have subtle differences in attitudes about HPV vaccines from parents of adolescents that could be important to consider for intervention to
improve vaccine uptake among this population. Harm was the only factor that
performed similarly between these two populations and also consistently predicted
vaccination intention over a variety of time frames. This suggests that educational
strategies focusing on mitigating perceived harms from the vaccine may have the widest
influence and appeal across populations of different ages.

Zimet, Weiss, Rosenthal, Good, and Vichnin (2010) conducted a study to better
understand reasons for non-vaccination among insured 19-26 year-old women and to
evaluate future vaccination intentions. They used an administrative claims database
from a large United States managed care plan to identify women aged 19-26 for receipt
of a mailed survey. From a sample of 1,375 women with no evidence of HPV
vaccination from June 1, 2006 through April 30, 2007, 222 completed surveys were
received, of which 185 were eligible for this analysis. The main outcome measures were
unvaccinated women’s attitudes and vaccine awareness, likelihood of future action
regarding the vaccine, and reasons for inaction.

Zimet et al. (2010) results revealed that among the 185 non-vaccinees, 25.4%
were married, 83.2% were white, and 89.2% had a college or higher level education.
The vaccine was described as very important by 32.4% of subjects, and 30.1% had
discussed the vaccine with a doctor and received a doctor’s recommendation. Half or
fewer of respondents were “very” or “extremely” likely to discuss the vaccine with their
doctor (50.0%), do additional research on the vaccine (42.6%), ask a doctor to get the
vaccine (37.5%), or make an appointment to get the vaccine (27.8%), while 48.0% were
“somewhat”, “very”, or “extremely” likely to do nothing to get the vaccine. Among the
latter, reasons for taking no action included being married or in a monogamous
relationship (54.9%), belief that the vaccine is too new (35.4%), not having enough information about the vaccine (31.7%), concerns about side effects (24.4%), and uncertainty about insurance coverage (24.4%). This concluded that educational interventions may be needed to enhance HPV vaccination rates among 19-26 year-old women, particularly regarding information about vaccine safety, vaccine efficacy, insurance coverage, and the value of vaccination to women in monogamous relationships.

Juraskova, Abdul Bari, O’Brien, and McCaffery’s (2011) stigma around STIs may reduce acceptance of the vaccine, the effect of information framing (“cervical cancer” versus “cervical cancer plus genital warts”) on intention to receive the HPV vaccine and actual uptake behavior was examined using the health belief model (HBM). They randomized 159 young women under the age of 27 to receive one of two variations of a fact-sheet describing the HPV vaccine as 1) preventing cervical cancer or 2) preventing cervical cancer and genital warts. Their results revealed low HPV knowledge (22%) and high HPV vaccination intention (79%), which was not influenced by information framing. Receipt of the vaccine at the two-month follow-up was 37%, and was also not influenced by information framing. The overall HBM predicted vaccination intention \( (p < .001) \) and behavior \( (p < .002) \). However, only barriers \( (p < .029) \) and benefits \( (p < .001) \) independently predicted HPV vaccination intention; susceptibility \( (p < .023) \) and benefits \( (p < .033) \) independently predicted HPV vaccination behavior. It was concluded that highlighting the sexual transmissibility of HPV does not seem to lower vaccination intentions or behaviors among young women.
Theoretical Framework

This section elaborates on three theoretical frameworks on which this study is based. The objective is providing a framework around which the study will be centered. These frameworks include the Theory of Planned Behavior, Health Belief Model, and Risk Exposure Theory.

Theory of Planned Behavior

As stated by Howell, Shepperd, and Logan (2013), the Theory of Planned Behavior (TPB) offers a potential framework for understanding barriers to screening for mouth and throat cancer among African Americans, as well as screening other forms of cancer. According to the TPB, behavior (in our case, screening) flows from intentions, which are the result of three factors that include attitudes, subjective norms, and perceived behavioral control.

As explained further by Howell et al. (2013), an attitude has two components: (i) how positively or negatively the person views the behavior and (ii) a belief about the consequences of the behavior (e.g., whether the behavior will be effective in producing the desired outcome). People may be disinclined to undergo screening for cervical cancer because they are unaware of cervical cancer, do not regard it as severe, believe that screening will be ineffective, or believe that screening will not increase their chances of living longer.

The second factor, subjective norms, as clarified by Howell et al. (2013), refers to how other people feel about the behavior and reflects social pressures to engage or not engage in a behavior. According to the TPB, people may be disinclined to undergo
screening for cervical cancer because screening is not endorsed or encouraged by trusted community leaders or because they do not value the opinion of health professionals who advocate screening. The third factor, perceived behavioral control, refers to the perceived difficulty of engaging in the behavior and reflects personal control of behavior. Accordingly, people may be disinclined to undergo screening for cancer because they believe they do not have time to see a health professional or do not have access to a health professional because of transportation or financial problems.

Kroshus, Baugh, Daneshvar, and Viswanath (2013) explained Theory of Planned Behavior (TPB) in the context of involving rational decision making. According to the theory, the most important predictor of a behavior is the intention to perform that behavior. Intention is conceptualized as being directly predicted by three factors: attitudes, subjective norms, and perceived behavioral control. As such, intention mediates the association among these factors and the performance of the behavior.

Kroshus et al. (2013) further explained the three factors that predict intention. Attitude reflects the individual’s evaluation of the consequences of performing the behavior. Subjective norms reflect perceived pressure to perform the behavior from people whose opinions and behaviors are considered important to the individual in question. Perceived behavioral control (PBC) reflects an individual’s evaluation of the ability to perform the behavior.

Ajzen (2002) suggested that self-efficacy may be considered a component of an individual’s PBC. Similar to PBC, self-efficacy reflects an individual’s confidence in the ability to perform a particular behavior under specific relevant conditions. Within
According to the theory of planned behavior, if behavior is under volitional control, the intention to perform an action will highly correlate with the action itself. The theory refers to “attitude toward the behavior” as “the degree to which a person has favorable or unfavorable evaluation or appraisal of the behavior in question.” Attitudes are made up of the beliefs people hold about the object and the associated evaluation of that belief. The theory posits that attitude is usually assumed to form a bipolar continuum, from a negative evaluation on one end to a positive evaluation on the other (Ratanasiripong & Chai, 2013).

Health Belief Model

Health Belief Model (HBM) was designed to precipitate that people will engage in health-related behaviors if they believe they can avoid a negative health condition. It seeks an understanding of how a person has or lacks motivation to engage in preventive health behaviors or programs. HBM was originally designed to explain the failure of people to engage in preventative health practices and programs. HBM examines an individual’s behavior, values, and judgment of how an action will provide a positive outcome. This can provide as a good predictor of participation in prevention screening programs (Daddario, 2007).

HBM posits the individual belief that a specific action will be beneficial in reducing a health threat. This is the effects of health beliefs and decision making methods that will affect behavioral changes. HBM examines difficulties in performing
specific behaviors and the negative consequences that could happen from not performing those behaviors and cues to action such as environmental events, bodily events, or stories from the media that can trigger perceptions of susceptibility (Poss, 2001; Daddario, 2007). This also has to do with perceived barriers to preventive activities. A child’s own perception on that of their parents’ may be a barrier to obesity prevention. Barriers defined by the HBM are the individual’s perception about the illness or disease. The HBM also includes normative and cultural factors that may influence health-seeking behaviors (Poss, 2001).

Neff and Crawford (1998) state the HBM posits that illness knowledge factors, perceived susceptibility to a disease and perceived severity of the disease influence preventative health behaviors. The effects of these factors are influenced by the benefits and efficacy of preventative action and perceived barriers to preventative activities. This indicates that there is a lack of clarity in terms of the structural relationships between model variables. Perceived barriers are the most consistent predictors across the study. HBM focuses on the attitudes and beliefs of individuals. The HBM is based on the individual participation in health-related action if that individual (1) feels that a negative health condition can be avoided; (2) has a positive expectation that he/she will avoid a negative health condition by participation in preventative measures; and (3) believes that he/she can successfully participate in the health-related action. Health Belief Model attempts to reduce the health epidemic by incorporating prevention components, susceptibility, severity, benefits, barriers, actions, and self-efficacy. Health Belief Model examines dependably related variables for preventative health behavior
outcomes. Severity has been deemed as the least reliable among HBM variables (Neff & Crawford, 1998).

**Risk Exposure Theory**

The social patterning of disease and mortality provokes a search for explanation. One potential underlying explanation for socioeconomic status (SES) gradients in health is exposure to multiple risk factors. Income and class tend to sort individuals into different settings that are often accompanied by systematic differences in environmental quality. Housing and neighborhood quality, pollutants and toxins, crowding and congestion, and noise exposure all vary with SES. Persons lower in SES also experience more adverse interpersonal relationships with family members, friends, supervisors, and community members. Furthermore, exposure to these multiple risk factors is associated with worse health outcomes. Thus, the convergence of exposure to multiple physical and psychosocial risk factors accompanying disadvantage may account for a portion of SES gradients in health in both childhood and adulthood (Evans & Kim, 2010).

Risk exposure theory helps us to understand how exposure to a high prevalence to social and environmental factors can increase the likelihood of a higher prevalence of sexually transmitted diseases. The concept of risk is to understand how the decisions women make in regards to their health or the decision to engage in unhealthy behaviors can greatly affect if a person contracts HPV or cervical cancer. To explain risk exposure is to address how exposure to certain factors (biological, physiological, social, and environmental) can influence the decision to engage in potential risky behaviors or not. Social risk factors such as minority communities being targeted for alcohol and tobacco
consumption also plays a part in the increase of risky exposure to engage in sexual activity at higher rates (LaVeist, 2005).
CHAPTER III

METHODOLOGY

Chapter III presents the methods and procedures that were used in conducting the study. The following are described: research design; description of the site; sample and population; instrumentation; treatment of data, and limitations of the study.

Research Design

A descriptive and explanatory research design was employed to conduct this study. The study was designed to obtain appropriate data to explain if there is a relationship between prevention and barriers of human papillomavirus/cervical cancer vaccination among African-American women in Georgia.

The descriptive research design permitted a descriptive analysis of the demographic characteristics of the respondents. The descriptive research design also enabled for a description of cervical cancer and African-American women and a description of cervical cancer vaccination. The explanatory research design assisted with the explanation of cervical cancer barriers related to knowledge of cervical cancer, perceived susceptibility, and attitudes towards screening measures. The explanatory research design further facilitated the explanation of the statistical relationship between prevention and barriers of human papillomavirus and cervical cancer vaccination.

68
Description of the Site

The research study was conducted in Ware County, Dougherty County, and Fulton County, Georgia. This research was part of an IRB approved study on the relationship of human papillomavirus and cervical cancer prevention and screening barriers among African American women in Georgia. The selection of the participants utilized nonprobability convenience sampling. The participants were considered nonprobability because they were intentionally selected based on specific elements related to the study (Dudley, 2011). The participants were considered to be convenience samples because they were not randomly selected from the entire population being studied (Marlow, 2011).

Sample and Population

Participants were eligible to participate in the study if they were female, age 18 or older, and reside in Georgia. One hundred and seventeen (117) women agreed to participate in the study via signing consent of authorization form. Demographic data and survey results on 117 participants were collected utilizing convenient sampling. The researcher disseminated and collected the surveys from participants. The survey obtained the following information on race, age, educational level, health insurance, legal requirement for health insurance, prevention of cervical cancer, and screening barriers of cervical cancer. All participants' identifying information used for research is protected.
Instrumentation

The research study employed a survey questionnaire entitled *A Study of the Relationship of Cervical Cancer Prevention and Screening Barriers*. The study examined the relationship of cervical cancer prevention and barriers of African-American women in Georgia. Women completing the survey for a non-generalizable study exploring barriers associated with cervical cancer prevention among African-American women in Georgia were intentionally sampled by age (18 years and older), race (African-American), and locality (Georgia). Women who met the criteria and indicated an interest were approached to participate in this study. Eligible women were provided letters, authorization of consent and a short survey to complete and return to the researcher. The letters explained the nature of the study, the purpose of the study, procedures for the survey that included an explanation of voluntary participation and time frame, confidentiality, contact information. The survey questionnaire consisted of two sections with a total of 22 questions.

Section I solicited demographic information about the characteristics of the respondents. The first five items consisted of demographic information that described race, age, education, if they had health insurance, and if they would have health insurance if it were not a legal requirement. These items will provide information for the presentation of a patient demographic profile and determine knowledge of prevention, knowledge of barriers that relate to knowledge of cervical cancer, perceived susceptibility, and attitudes towards screening measures.

Section II consist of 17 questions related to prevention and barriers. Section II of the survey explored the knowledge of prevention and barriers of human papillomavirus
and cervical cancer. Ten questions were related to prevention and there were seven barrier questions. The 22 questionnaire was returned to the researcher with completed consent.

Treatment of Data

Statistical treatment of the data employed descriptive statistics, which included measures of central tendency, frequency distribution, and cross tabulation. Statistical analyses were performed by using a twenty-two survey questionnaire. The chi-squared test was used to test the hypothesis and determine if there is a relationship of cervical cancer/human papillomavirus prevention and barriers towards knowledge of cervical cancer, perceived susceptibility, and attitudes towards screening measures of African-American women in Georgia.

Frequency distribution was used to analyze each of the variables of the study in order to summarize the basic measurements. It was further used to analyze the demographics of the study to gain an understanding of the participants. Cross tabulations were utilized to demonstrate the statistical relationship between prevention and barriers to cervical cancer among African-American women in Georgia.

The test statistics that was employed in this research study was chi square. Chi square allows the research to determine dependence and non-dependence on variables. Chi square also helps determine relationships (Bresnahan & Shapiro, 1966).

Limitations of the Study

This study has three primary limitations. The first limitation is that the survey questionnaire was only limited to women. The second limitation is the age group of the
women is 18 years old and older, although vaccination is recommended for females starting at age 11, thus, a non-generalizable study was conducted. A third limitation is the short time frame the survey was administered. May – June 2014 were the dates the survey questionnaire was being employed.
CHAPTER IV
PRESENTATION OF FINDINGS

The purpose of this chapter is to present the findings of the study in order to describe and explain the barriers of cervical cancer prevention among African-American women. The findings are organized into two sections, which include demographic data and research questions and hypotheses.

Demographic Data

This section provides a profile of the study respondents. Descriptive statistics were used to analyze race, age, educational level, if participants had health insurance, and if participants would have health insurance if it was not a legal requirement. A target population for the research was composed of women who were 18 years of age and older, who resided in the state of Georgia. These participants provided consent to participate in this study. The data were analyzed using SPSS.
### Table 1
Demographic Profile of Study Respondents (N=117)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>53</td>
<td>45.3</td>
</tr>
<tr>
<td>Caucasian</td>
<td>60</td>
<td>51.3</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-28</td>
<td>48</td>
<td>41.0</td>
</tr>
<tr>
<td>29-39</td>
<td>27</td>
<td>23.1</td>
</tr>
<tr>
<td>40-50</td>
<td>20</td>
<td>17.1</td>
</tr>
<tr>
<td>51 and older</td>
<td>22</td>
<td>18.8</td>
</tr>
<tr>
<td><strong>Educational Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some High School</td>
<td>7</td>
<td>6.0</td>
</tr>
<tr>
<td>High School Diploma/GED</td>
<td>15</td>
<td>12.8</td>
</tr>
<tr>
<td>Some College</td>
<td>56</td>
<td>47.9</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>22</td>
<td>18.8</td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>17</td>
<td>14.5</td>
</tr>
</tbody>
</table>
Table 1 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>86</td>
<td>73.5</td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>23.1</td>
</tr>
<tr>
<td>Health Insurance without legal requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>96</td>
<td>82.1</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
<td>15.4</td>
</tr>
</tbody>
</table>

As indicated in Table 1, the typical respondent of the study was a Caucasian woman who age ranged between 18-28 years old, with some college education, and who had health insurance. The typical respondent indicated that they would have health insurance even if it was not a legal requirement.

Table 2 is a frequency distribution about the prevention of cervical cancer and human papillomavirus among the respondents. Table 2 indicates whether the 117 respondents seek medical assistance from a gynecologist office or health clinic for Women’s health as a prevention of cervical cancer.
Table 2

Prevention of Cervical Cancer through Gynecologist or Health Clinic Visit

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gynecologist Office</td>
<td>87</td>
<td>74.4</td>
<td>29</td>
<td>24.8</td>
</tr>
<tr>
<td>Health Clinic</td>
<td>33</td>
<td>28.2</td>
<td>81</td>
<td>69.2</td>
</tr>
<tr>
<td>Neither</td>
<td>16</td>
<td>13.7</td>
<td>85</td>
<td>72.6</td>
</tr>
</tbody>
</table>

Note: Numbers do not total 117 because of missing data

As shown in table 2, majority (74.4%) of the respondents go to a gynecologist office for women’s health while 28.2% go to the health clinic for women’s health services. This indicates that most of the respondents participate in prevention for women’s health. Only 16 respondents or 13.7% do not go to either a gynecologist office or a health clinic for women’s health.

Table 3 is a frequency distribution of the 117 respondents’ participation in cervical cancer prevention measures. Table 3 indicates whether the respondents previously participated in preventative measures for cervical cancer.
Table 3

Prevention 2: Cervical Cancer Test or Exam

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>93</td>
<td>89.7</td>
</tr>
<tr>
<td>No</td>
<td>24</td>
<td>10.3</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: Numbers do not total 117 because of missing data

As shown in Table 3, the majority (89.7%) of the respondents have taken a test or exam for cervical cancer as a preventative measure. Only 10.3% indicated that they had not been tested or examined.

Table 4 is a frequency distribution of the respondents’ participation in vaccination for cervical cancer/human papillomavirus. Table 4 indicates whether the 117 respondents received a vaccination for cervical cancer as a preventative measure. Vaccination is broken down into the following two sub-facets, Vaccine 1 - Cervical Cancer, and Vaccine 2 - Human Papillomavirus (HPV).
Table 4

Vaccination Sub-facets among Respondents

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine 1: Cervical Cancer</td>
<td>24</td>
<td>20.5</td>
<td>92</td>
<td>78.6</td>
</tr>
<tr>
<td>Vaccine 2: HPV</td>
<td>32</td>
<td>27.4</td>
<td>80</td>
<td>68.4</td>
</tr>
</tbody>
</table>

Table 4 revealed that 78.6% of the participants indicate had not taken the cervical cancer vaccination while only 20.5% indicated that they had taken the cervical cancer vaccination as a preventative measure. The table also shows that only 27.4% of the respondents have been vaccinated for human papillomavirus (HPV). The majority (68.4%) of the participants who responded to the question regarding the HPV vaccine indicate they have not been vaccinated.

Table 5 is a frequency distribution of the 117 respondents’ knowledge of cervical cancer and human papillomavirus. Table 5 indicates whether the respondents’ knowledge about cervical cancer is a barrier to cervical cancer prevention. Knowledge of cervical cancer was divided into the following three sub-facets, knowledge of cervical cancer; knowledge of human papillomavirus or HPV; and knowledge of HPV in same category as HIV.
As shown in Table 5, the majority (85.5%) of the respondents indicated that they have knowledge of cervical cancer. While 77.8% of the respondents indicated they had knowledge of human papillomavirus, only 27.4% indicated that human papillomavirus (HPV) is in the same category as Human immunodeficiency virus (HIV).

Table 6 is a frequency distribution of the respondent’s current participation in sex. Table 6 indicates whether being sexually active is a barrier to perceived susceptibility of cervical cancer prevention of the 117 respondents.
Table 6  

Sexually Active

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>81</td>
<td>69.2</td>
</tr>
<tr>
<td>No</td>
<td>36</td>
<td>30.8</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 6 indicated that 69.2%, of the 117 respondents, indicated that they were sexually active while only 30.8% indicated that they were not sexually active.

Table 7 is a frequency distribution of the respondents' attitude regarding a vaccine that prevents certain sexually transmitted diseases would promote sexual activity or sexual promiscuity. Table 7 indicates whether the 117 respondents' belief about a vaccine that prevents sexually transmitted diseases would promote sexual activity or sexual promiscuity is a barrier to cervical cancer prevention.
Table 7

Vaccine Promoting Sexual Activity or Promiscuity

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>53</td>
<td>45.3</td>
</tr>
<tr>
<td>No</td>
<td>60</td>
<td>51.3</td>
</tr>
<tr>
<td>Total</td>
<td>113</td>
<td>96.6</td>
</tr>
</tbody>
</table>

Note: Numbers do not total 117 because of missing data

As shown in Table 7, of the 113 respondents, 51.3% indicated that they do not think that a vaccine that prevents certain sexually transmitted diseases would promote sexual activity or sexual promiscuity while 45.3% indicated that it will promote sexual activity or promiscuity.

Table 8 is a frequency distribution of the 117 respondents’ attitude toward a vaccine that prevents certain sexually transmitted diseases being administered to females as young as 11 years old is seen as a barrier for women not being vaccinated for cervical cancer/HPV. Table 8 indicates whether the respondents’ think a vaccine that prevents a sexually transmitted disease should be administered to females as young age 11.
Table 8
Vaccine Administered to Females at Age 11

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>71</td>
<td>60.7</td>
</tr>
<tr>
<td>No</td>
<td>44</td>
<td>37.6</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>98.3</td>
</tr>
</tbody>
</table>

Note: Numbers do not total 117 because of missing data

As shown in Table 8, the respondents think that a vaccine should be administered to females at age 11 to prevent a sexually transmitted disease. Of the 115 respondents, 60.7% indicated that they think a vaccine that prevents a sexually transmitted disease should be administered to females as young as 11 years old, while 37.6% indicated that they do not think a vaccine should be administered to females at age 11 to prevent a sexually transmitted disease.

Table 9 is a frequency distribution of the respondents’ belief that having a state requirement for a vaccine that prevents a sexually transmitted disease. Table 9 indicates whether having a state requirement for a vaccine for sexually transmitted disease is a barrier for cervical cancer prevention.
Table 9

State Requirement of Vaccine for a Sexually Transmitted Disease

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>77</td>
<td>65.8</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>33.3</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>99.1</td>
</tr>
</tbody>
</table>

Note: Numbers do not total 117 because of missing data

Table 10 is a cross tabulation with participants who visit a health clinic or gynecologist office for women’s health with participants’ knowledge about cervical cancer. The table shows the association of participants’ knowledge of cervical cancer and those who visit a health clinic or gynecologic office for women’s health.
Table 10
Do Go to Health Clinic for Health by Knowledge of Cervical Cancer: Cross tabulation

<table>
<thead>
<tr>
<th>Knowledge of Cervical Cancer</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>I go to the health clinic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>29</td>
<td>25.2</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>69</td>
<td>60.0</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>85.2</td>
<td>17</td>
</tr>
</tbody>
</table>

Chi Square = .051 df 1

Note: Numbers do not total 117 because of missing data

Table 11 is a cross tabulation with participants who do not visit a health clinic or gynecologic office for women’s health with participants’ knowledge about cervical cancer. The table shows the association of participants’ knowledge of human papillomavirus and those who visit a health clinic or gynecologic office for women’s health. The table indicates whether there was a statistically significant relationship between the two variables.
As shown in Table 11, 14.7% of the respondents indicated that they do not go to either a gynecologist office or clinic for cervical cancer and they have knowledge of cervical cancer. Majority (70.6%) of the respondents indicated “no” to the question about them not going to either gynecologist office or a health clinic which means that most participants practice preventative measures for women’s health. When the chi-square statistical test was applied, it was indicated that (.034) there was a statistical significance between the two variables at a probability level of .05.

Table 12 is a cross tabulation of participants participation in cervical cancer prevention measures and their knowledge about cervical cancer. The table shows the
association of participants’ knowledge of cervical cancer with their participation in cervical cancer prevention measures. The table indicates whether there was a statistically significant relationship between the two variables.

Table 12

Tested for Cervical Cancer by Knowledge of Cervical Cancer: Cross tabulation

<table>
<thead>
<tr>
<th>Knowledge of Cervical Cancer</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>I have been tested for cervical cancer</td>
<td>#</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>83</td>
<td>71.0</td>
<td>10</td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>14.5</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>85.5</td>
<td>17</td>
</tr>
</tbody>
</table>

Chi Square = .022    df 1

As shown in Table 12, majority (79.5%) of the respondents have been tested for cervical cancer. Of the 117 respondents, 71% of the respondents indicated that they have knowledge of cervical cancer and have been tested for cervical cancer. Only 6% do not have knowledge of cervical cancer and have not been tested. The research indicates that there is a statistically significant relationship (.022) between the two variables at the .05 level of probability when the chi-square statistical test is applied.
Table 13 is a cross tabulation of participants participation in cervical cancer prevention measures and their knowledge about human papillomavirus. The table shows the association of participants' knowledge of human papillomavirus and their participation in cervical cancer prevention measures. The table indicated whether there was a statistically significant relationship between the two variables.

Table 13
Tested for HPV by Knowledge of HPV: Cross tabulation

<table>
<thead>
<tr>
<th>Knowledge of Human Papillomavirus</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>I have been tested for HPV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58</td>
<td>50.0</td>
<td>6</td>
</tr>
<tr>
<td>No</td>
<td>41</td>
<td>35.3</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>99</td>
<td>85.3</td>
<td>17</td>
</tr>
</tbody>
</table>

Chi Square = .016     df 1

Note: Numbers do not total 117 because of missing data

As shown in Table 13, half of the respondents (50%) have knowledge of human papillomavirus and have been screened or examined for human papillomavirus. When
the chi-square statistical test was applied, it was indicated that there was a statistical significance in the relationship between the two variables.

Table 14 is a cross tabulation of participants who have been vaccinated for cervical cancer and those participants who have been tested for human papillomavirus. The table shows the association of participants who have indicated being tested for human papillomavirus and those who have been vaccinated for cervical cancer. The table indicated whether there was a statistically significant relationship between the two variables.

Table 14
Tested for HPV by Vaccination for Cervical Cancer: Cross tabulation

<table>
<thead>
<tr>
<th>Vaccinated for Cervical Cancer</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>I have been tested for HPV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19</td>
<td>16.2</td>
<td>74</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>4.3</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>20.5</td>
<td>93</td>
</tr>
</tbody>
</table>

Chi Square = .14 df 1
As shown in Table 14, although majority (79.5%) of the respondents have been tested for HPV, only 16.2% indicated that they have been vaccinated for cervical cancer. When the chi-square statistical test was applied to the variables, it was not indicated as having a significant relationship at the .05 level of probability.

Table 15 is a cross tabulation between participants who responded that they were sexually active and whether participants have had a screening/examination as a preventative measure for cervical cancer/human papillomavirus. The table shows the association of participants who are sexually active and whether they get examined for prevention of cervical cancer/human papillomavirus. The table indicated whether there was a statistically significant relationship between the two variables.

Table 15
Pap Smear by Vaccination for Cervical Cancer: Cross tabulation

<table>
<thead>
<tr>
<th>Vaccinated for Cervical Cancer</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have had a Pap smear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>76</td>
<td>65.0</td>
<td>29</td>
<td>24.8</td>
<td>105</td>
<td>89.7</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>4.3</td>
<td>7</td>
<td>6.0</td>
<td>12</td>
<td>10.3</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>69.2</td>
<td>36</td>
<td>30.8</td>
<td>117</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Chi Square = .029  df 1
As shown in Table 15, 6% of the respondents indicated that they have not had a Pap smear and they are not sexually active. A majority (89.7%) responded that they have had a Pap smear. When the variable of having a Pap smear was cross-tabulated with the being sexually active variable, 65% of the respondents indicated that they have had a Pap smear and they were sexually active. When chi-square statistical test was applied, it was indicated that there is a statistically significant relationship between the two variables.

Table 16 is a cross tabulation between participants who have been examined/screened for cervical cancer/human papillomavirus and the participants' attitude towards a vaccine that prevents a sexually transmitted disease as promoting sexual activity or sexual promiscuity. The table shows the association of participants who think that a vaccine that prevents a sexually transmitted disease is promoting sexual activity or sexual promiscuity and whether participants have been examined or screened for cervical cancer. The table indicated whether there was a statistically significant relationship between the two variables.
Table 16

Tested for Cervical Cancer by Vaccine Promoting Sexual Activity or Promiscuity: Cross tabulation

<table>
<thead>
<tr>
<th>Vaccine promoting sexual activity or promiscuity</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Tested for cervical cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>40</td>
<td>35.1</td>
<td>50</td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td>11.4</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>46.5</td>
<td>61</td>
</tr>
</tbody>
</table>

Chi Square = .089   df 2

Note: Numbers do not total 117 because of missing data

Although majority (78.9%) of the respondents has been tested for cervical cancer, only 43.9% have indicated that a vaccine for a sexually transmitted disease would not promote sexually activity or sexual promiscuity. The chi-square statistical test was applied to test statistical significance, and it indicated that there was not a statistical significant relationship between the two variables at the .05 level of probability.

Table 17 is a cross tabulation between participants who have been examined/screened for human papillomavirus and their attitude towards a vaccine that
prevents a sexually transmitted disease being given to females as young as 11 years old.
The table shows the association between participants attitude towards a vaccine that prevents a sexually transmitted disease should be administered to females starting at age 11 and if they have been examined themselves. The table indicated whether there was a statistically significant relationship between the two variables.

Table 17
Examined for HPV by Vaccine Administered at Age 11: Cross tabulation

<table>
<thead>
<tr>
<th>Vaccine should be administered at age 11</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Examined for HPV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59</td>
<td>51.4</td>
<td>91</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>10.4</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>71</td>
<td>61.7</td>
<td>115</td>
</tr>
</tbody>
</table>

Chi Square = .183       df 1

Note: Numbers do not total 117 because of missing data
As shown in Table 17, of those tested for HPV (79.1%), majority (51.3%) indicated that a vaccine that prevents a sexually transmitted disease should be administered to females as young as 11 years of age. When the chi-square statistical test for significance was applied, it was revealed that there was no statistically significant difference. Table 17 also shows that of the respondents who have not been tested for cervical cancer (20.8%) their responses were divided in terms of whether a vaccine should be administered to young females age 11.

Table 18 is a cross tabulation between participants who have been screened human papillomavirus and the participants’ attitude towards a vaccine that prevents a sexually transmitted disease being a state mandate. The table reveals an association between participants’ attitudes about a vaccine that prevents a sexually transmitted diseases being a state mandate and whether they have been screened for human papillomavirus. The table indicated whether there was a statistically significant relationship between the two variables.
Table 18

Examined for HPV by Agree to State Requirement: Cross tabulation

<table>
<thead>
<tr>
<th></th>
<th>Agree with having state requirement for vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>I have been examined for HPV</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
</tr>
</tbody>
</table>

Chi Square = .361      df 1

Note: Numbers do not total 117 because of missing data

As indicated by Table 18, of the 115 respondents, 66.1% indicated that they agree with having a state requirement for a vaccine that prevents a sexually transmitted disease. A slight majority (55.7%) have been examined or screened for human papillomavirus. When the variables were cross tabulated for significance by using the chi-square statistical test (.361), the research did not indicate a statistically significant relationship at the .05 level of probability.

Table 19 is a cross tabulation between participants who are sexually active and if they visit a health clinic or gynecologist office for women’s health. The table shows an association of participants who are sexually active and whether they visit a health clinic
or gynecologist office for women’s health. The table indicated whether there was a statistically significant relationship between the two variables.

Table 19

Do Not Go to Office or Clinic by Sexually Active: Cross tabulation

<table>
<thead>
<tr>
<th>Sexually Active</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>No office or clinic visit</td>
<td>7</td>
<td>6.9</td>
<td>9</td>
</tr>
<tr>
<td>Yes</td>
<td>61</td>
<td>59.8</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>66.7</td>
<td>34</td>
</tr>
</tbody>
</table>

Chi Square = .034   df 1

Note: Numbers do not total 117 because of missing data

A majority (84.3%) of the respondents stated they do go to either a gynecologist office or health clinic. There were 15.7% respondents who stated not going to either a gynecologist office or health clinic for women’s health. Of the respondents who do not go to either, a little over half (8.8%) state they are not sexually active. When the variables were cross tabulated by using the chi-square statistical test for significance,
the research indicated that there was a statistical significant relationship (.034) at the .05 level of probability.

Research Questions and Hypotheses

This study contains four research questions and four null hypotheses in the study. This section provides an analysis of the research questions and a testing of the null hypotheses.

Research Question 1 studied the relationship between cervical cancer prevention and the knowledge of cervical cancer. Chi square showed a relationship between the two variables ($x^2 = .022$). Null hypothesis 1 stated there is no statistically significant relationship between cervical cancer prevention and the knowledge of females toward cervical cancer. The null hypothesis was rejected ($x^2 = .022$) indicating that there is a statistically significant relationship between the two variables at the .05 probability level.

Research Question 2 examined the relationship between cervical cancer prevention and a female’s perceived susceptibility of cervical cancer. A statistical relationship was determined by testing with chi-square ($x^2 = .029$). Null Hypothesis 2 stated there is no statistically significant relationship between cervical cancer prevention and a female’s perceived susceptibility of cervical cancer. When the chi square statistical test for significance was applied, the research rejects the null hypothesis ($x^2 = .029$) indicating that there was a statistically significant relationship between the two variables at the .05 level of probability.
Research Question 3 investigated the relationship between knowledge of human papillomavirus and those who have been vaccinated for human papillomavirus and a relationship was indicated. Null Hypothesis 3 stated there is no statistically significant relationship between a woman's knowledge of human papillomavirus and those who have been vaccinated for human papillomavirus. The research rejected the null hypothesis ($x^2 = .029$) indicating a statistically significant relationship.

Research Question 4 investigated the relationship between cervical cancer prevention and the attitudes toward cervical cancer vaccination. This question was divided up into the following three subsets of administering a vaccine would promote sexual activity or promiscuity; administering a vaccine for a sexually transmitted disease to an 11 year old female; and agreement of a state requirement for vaccine that prevents a sexually transmitted disease. Null Hypothesis 4 states there is no statistical relationship between the cervical cancer prevention and the attitudes of females towards cervical cancer screening measures. When the chi square statistical test for significance was applied to all three subsets, the research failed to reject the null hypothesis (.089, .183, and .361, respectively) indicating that there was not a statistically significant relationship between the variables at the .05 level of probability.
According to Last (2007), health behavior is "the combination of knowledge, practices, and attitudes that together motivate the actions we take regarding health." These actions or barriers can increase the risk of negative health outcomes or they can help prevent negative health outcomes. National Institutes of Health (2008) define health disparities as "the difference in the incidence, prevalence, mortality, and burden of disease and other adverse health conditions that exists among specific population groups in the United States."

Racial/ethnic minorities suffer a disproportionate burden of barriers to obtaining care. Barriers are factors that can hinder a person from accessing care or taking preventative methods. Barriers can also influence the individual's ability to engage in the health care system in such a way as to ensure good quality care (LaVeist, 2005).

The research study was designed to answer questions concerning the impact of cervical cancer prevention and barriers on the participation of the cervical cancer/human papillomavirus vaccination. The conclusions and recommendations of the research findings are presented in this chapter. Recommendations are proposed for future discussions for social workers, public health professionals, health care practitioners,
policy makers, and administrators. The research questions are presented to summarize the significant findings of interest.

The researcher examined three barriers to cervical cancer prevention and chi-square statistical test was applied for indicating a statistical relationship at a .05 level of probability. The research did not indicate that there is statistically significant relationship between prevention and attitudes towards screening measures. The attitudes towards screening measures included thoughts of a vaccine promoting sexual activity and promiscuity (.089); thoughts of a vaccine being administered to 11 year old females (.183); and a vaccine being state required (.361).

The researcher studied the relationship of cervical cancer prevention and knowledge of cervical cancer and there was a statistically significant relationship between cervical cancer prevention and knowledge of cervical cancer. The prevention of visiting a health clinic or gynecologist and the knowledge of cervical cancer was statistically significant (.051) at the .05 level of probability. Pap smear as a prevention for cervical cancer and the knowledge of cervical cancer has a statistically significant relationship (.022) at the .05 probability level. Visiting a gynecologist or health clinic as a prevention measure and having knowledge of human papillomavirus indicated a statistically significant relationship (.034) at the .05 level of probability. Being screened for human papillomavirus as a preventative measure and having knowledge of cervical cancer did not indicate a statistical relationship (.16) at the .05 level of probability.
Recommendations

As a result of the findings of this study, the researcher recommends that

1. A study is conducted to determine if respondents participated in cervical cancer prevention after completion of the survey.

2. Policy makers examine particular facets that encourage African-American women to participate in cervical cancer prevention and implement these aspects to design effective prevention programs that specifically target African-American women.

3. Social workers should become advocates for this population group when discussing prevention with policy makers, colleagues, and anyone they may encounter that is not knowledgeable about the important barriers to cervical cancer prevention.

4. A study is conducted to understand what information individuals would want to have in order to make the decision to vaccinate and how to educate them. This includes who should do the educating and what information should be included for this population.

5. Social workers should become more aware of barriers that are important to African-American women and cervical cancer prevention to exercise supportive efforts, foster education to address these barriers, and encourage prevention to cervical cancer.
Implications to Policy or Practice

Today, African Americans still bear a disproportionate burden in disease morbidity, mortality, disability, and injury. This continuing health disadvantage is seen particularly in the age-adjusted mortality rates: African Americans remain significantly and consistently more at risk for early death than do similar White Americans. The overall death rate of African Americans in the United States today is equivalent to that of Whites in America 30 years ago (Mays, Cochran, & Barnes, 2006).

The continuing legacy of poor health in Americans, despite the overall improved conditions of their lives, is one compelling reason to take a closer look at the role discrimination may play. The health disparities that affect African Americans in this country arise from many sources, including cultural differences in lifestyle patterns, inherited health risks, and social inequalities that are reflected in discrepancies in access to health care, variations in health providers' behaviors, differences in socioeconomic position and residential segregation. The extent to which these health disparities are also shaped by the pernicious effects of race-based discrimination is of growing interest.

Policy decisions to address specific problems must also be made within the broader macro context because policies designed to bring about change in one health care sector can have wider repercussions, both desirable and undesirable, in other sectors of the system. Policy decisions and their implementation are often critical to the future direction of the health care delivery system. An understanding of the health care system has specific implications for health services managers, who must understand the macro environment in which they make critical decisions in planning and strategic management (Shi & Singh, 2012).
The sustainability of delivery settings and the success of health care managers depend on how the managers react to the system dynamics. Timeliness of action is often a critical factor that can make the difference between failure and success. Managers are better able to evaluate the implications of health policy and new reform proposals when they understand the relevant issues and how such issues link to the delivery of health services in the establishments they manage (Shi & Singh, 2012).
APPENDIX A

IRB APPROVAL LETTER

CLARK ATLANTA UNIVERSITY
Institutional Review Board
Office of Sponsored Programs

May 2, 2014

Ms. Annalease Gibson <annaleaseg@hotmail.com>
School of Social Work
Clark Atlanta University
Atlanta, GA 30314

RE: A Study of the Relationship Between Prevention and Barriers of Human Papillomavirus/Cervical Cancer Vaccination Among African American Women in Georgia

Principal Investigator(s): Annalease Gibson

Human Subjects Code Number HR2014-4-533-1

Dear Ms. Gibson:

The Human Subjects Committee of the Institutional Review Board (IRB) has reviewed your protocol and approved of it as exempt in accordance with 45 CFR 46.101(b)(2).

Your Protocol Extended Approval Code is HR2014-4-533-1/A

This permit will expire on May 1, 2015. Thereafter, continued approval is contingent upon the annual submission of a renewal form to this office.

The CAU IRB acknowledges your timely completion of the CITI IRB Training in Protection of Human Subjects - “Social and Behavioral Sciences Track”. Your certification is valid for two years.

If you have any questions, please contact Dr. Georgianna Bolden at the Office of Sponsored Programs (404) 880-5879 or Dr. Paul I. Musay, (404) 880-5829.

Sincerely:

[Signature]

Paul I. Musay, Ph.D.
Chair
IRB: Human Subjects Committee
cc: Office of Sponsored Programs, “Dr. Georgianna Bolden” <bolden@cau.edu>

223 James P. Arrowsley Drive, S.W. * ATLANTA, GA 30314-3791 * (404) 880-9000

Founded in 1867 by consolidation of Atlanta University, Morehouse, and Clark College, 1868

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APPENDIX B

CONSENT FORM

FORM D

A Study of the Relationship between Cervical Cancer Prevention and Screening Barriers

CONSENT FORM

You are invited to be in a research study that explores the prevention and barriers of human papillomavirus and cervical cancer among African American women in Georgia. You were selected as a possible participant because you are a woman that is at least 18 years of age or older and resides in Georgia. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Annalease Gibson, PhD student of Whitney M. Young, Jr. School of Social Work at Clark Atlanta University.

Background Information:

The purpose of this study is to learn about the barriers that prevent African American women from participating in preventative measures for human papillomavirus or cervical cancer. The findings will be used in an analysis for my dissertation. I would appreciate your cooperation.

Procedures:

If you agree to be in this study, we would ask you to do the following things. Answer each question appropriately. We want all of these responses to remain confidential; please do not put your name on the questionnaire answer sheet. Choose only one answer for each question. Please respond to all questions. There are two questionnaires given. Record your answers on one of the questionnaires and return it with this signed consent form. You may keep the other questionnaire for your records.
There are no known risks or personal benefits to participants who agree to take part in this study. However, it is hoped that this study will advance research in the field of social work and provide to the general knowledge of social work. The questionnaire should take approximately seven minutes to complete.

Confidentiality.

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a participant. Research records will be kept in a locked file; only the researchers will have access to the records.

Voluntary Nature of the Study.

Your decision whether or not to participate will not affect your current or future relations with the researcher, or Clark Atlanta University. Participation in this study is completely voluntary. You may withdraw at any time without affecting those relationships previously identified. To withdraw from the study, you can stop answering any questions on the survey and return the questionnaire to the researcher so that your information can be discarded.

Contacts and Questions:

The researcher conducting this study is Annalease Gibson under the advisement of Dr. Robert Waymer. You may ask any questions you have now. If you have questions later about the research, you may contact Dr. Robert Waymer at (404)-880-8561.

If you have any questions now, or later, related to the integrity of the research, (the rights of research subjects or research-related injuries, where applicable), you are encouraged to contact Dr. Georgianna Bolden at the Office of Sponsored Programs (404 880-6979) or Dr. Paul I. Musey, (404) 880-6829 at Clark Atlanta University. You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature ____________________________ Date: ____________________________

Signature of Investigator ____________________________ Date: ____________________________
APPENDIX C

SURVEY QUESTIONNAIRE

A Study of the Relationship between Cervical Cancer Prevention and Screening Barriers

Section I: Demographic Information

Place a mark (x) next to your response. Choose only one answer for each question.

1. Race: 1) ___ African American 2) ___ Caucasian
   4) ___ Hispanic/Latino 5) ___ Asian/Pacific Islander
   6) ___ Other

2. Age: 1) ___ 18-28 2) ___ 29-39
   3) ___ 40-50 4) ___ 51 and older

3. Educational Level: 1) ___ Some High School Education
   2) ___ High School Diploma/GED 3) ___ Some College Education
   4) ___ Bachelor’s Degree 5) ___ Graduate Degree

4. Do you have health insurance? 1) ___ Yes 2) ___ No

5. Would you have health insurance if it were not a legal requirement?
   1) ___ Yes 2) ___ No

Section II: This section is to explore your knowledge of prevention and barriers of human papillomavirus and cervical cancer. Please write the number (1 or 2) that best fits you in the blank space after each question.

1= Yes 2= No
APPENDIX C
(continued)

Prevention

6. I visit a gynecologist in his/her office for Women’s health. ______
7. I visit the health clinic for Women’s health. ______
8. I do not visit a gynecologist office or health clinic for Women’s health. ______
9. Have you ever been screened for cervical cancer? ______
10. Have you ever had a Pap smear? ______
11. If yes to #10, and explained the purpose of the Pap smear or what the Pap smear test reveals? ______
12. If no to #10, would you get tested if the benefits of the test were explained to you? ______
13. Have you ever been vaccinated for cervical cancer? ______
14. Have you ever been screened for human papillomavirus? ______
15. Have you ever been vaccinated for human papillomavirus? ______

Barriers

16. Do you have knowledge of cervical cancer? ______
17. Do you have knowledge of human papillomavirus or HPV? ______
18. Are you sexually active? ______
19. Is human papillomavirus in the same category as HIV? ______
20. Do you think administering a vaccine that prevents certain sexually transmitted diseases would promote sexual activity? ______
21. Do you think a vaccine that prevents a sexually transmitted disease should be administered to females as young as 11 years old? ______
22. Do you agree with having a state requirement for a vaccine that prevents a sexually transmitted disease? ______
APPENDIX D

SPSS PROGRAM ANALYSIS

TITLE 'A STUDY OF THE RELATIONSHIP OF CERVICAL CANCER PREVENTION'.
SUBTITLE 'Annalease Gibson'.

DATA LIST FIXED/
  ID 1-3
  RACE 4
  AGE 5
  EDUCATE 6
  HEALTH 7
  LEGAL 8
  GYNECO 9
  CLINIC 10
  NOOFFICE 11
  TESTED 12
  PAP 13
  EXPLAIN 14
  BENEFITS 15
  VACCINE 16
  SCREEN 17
  HUMAN 18
  CERVICAL 19
  HPV 20
  ACTIVE 21
  SAME 22
  SEXUAL 23
  YOUNG 24
  AGREE 25.

VARIABLE LABELS
  ID 'Questionnaire number'
  RACE 'Q1 My race'
  AGE 'Q2 My age'
  EDUCATE 'Q3 My educational level'
  HEALTH 'Q4 Do you have health insurance'
  LEGAL 'Q5 Would you have health insurance if it was not legal'
  GYNECO 'Q6 I go to a gynecologist office for womens health'
  CLINIC 'Q7 I go to the health clinic for womens health'
  NOOFFICE 'Q8 I do not go to a gynecologist office or health clinic'
  TESTED 'Q9 Have you ever been tested or examined for cervical cancer'
  PAP 'Q10 Have you ever had a pap smear'
  EXPLAIN 'Q11 Were you explained the purpose of the pap smear'
  BENEFITS 'Q12 Would you get tested if the benefits of the test'
  VACCINE 'Q13 Have you ever been vaccinated for cervical cancer'
APPENDIX D

(continued)

SCREEN 'Q14 Have you been examined or screened for HPV'
HUMAN 'Q15 Have you ever been vaccinated for human papillomavirus'
CERVICAL 'Q16 Do you have knowledge of cervical cancer'
HPV 'Q17 Do you have knowledge of human papillomavirus or hpv'
ACTIVE 'Q18 Are you sexually active'
SAME 'Q19 Is human papillomavirus in the same category as hiv'
SEXUAL 'Q20 Do you think vaccine that prevents sexually transmitted'
YOUNG 'Q21 Do you think vaccine should be administered as young'
AGREE 'Q22 Do you agree with have a state requirement'.

VALUE LABELS
RACE
1 'African American'
2 'Caucasian'
3 'Hispanic-Latina'
4 'Asian-Pacific Islander'/
AGE
1 '18-28'
2 '29-39'
3 '40-50'
4 '51 and older'/
EDUCATE
1 'Some High School Education'
2 'High School Diploma-GED'
3 'Some College Education'
4 'Bachelor Degree'
5 'Graduate Degree'/
HEALTH
1 'Yes'
2 'No'/
LEGAL
1 'Yes'
2 'No'/
GYNECO
1 'Yes'
2 'No'/
CLINIC
1 'Yes'
2 'No'/
NOOFFICE
1 'Yes'
2 'No'/
TESTED
1 'Yes'
2 'No'/
PAP
1 'Yes'
2 'No'/
APPENDIX D

(continued)

EXPLAIN
1 'Yes'
2 'No'/

BENEFITS
1 'Yes'
2 'No'/

VACCINE
1 'Yes'
2 'No'/

SCREEN
1 'Yes'
2 'No'/

HUMAN
1 'Yes'
2 'No'/

CERVICAL
1 'Yes'
2 'No'/

HPV
1 'Yes'
2 'No'/

ACTIVE
1 'Yes'
2 'No'/

SAME
1 'Yes'
2 'No'/

SEXUAL
1 'Yes'
2 'No'/

YOUNG
1 'Yes'
2 'No'/

AGREE
1 'Yes'
2 'No'/.

MISSING VALUES
RACE AGE EDUCATE HEALTH LEGAL GYNECO CLINIC NOOFFICE TESTED PAP
EXPLAIN BENEFITS VACCINE SCREEN HUMAN CERVICAL HPV ACTIVE SAME SEXUAL
YOUNG AGREE (0).

BEGIN DATA
00111212212111011121112121
0021441112211102121111011
003144111221110211210111
0042231122121222121122222
00522511122111211112222
0062251112211102121111221
APPENDIX D

(continued)

0072332212211122121112222
008213212111101111112211
0092431111111102221111212
010113211122122222212112
0111241112212122122221221
012113122111101211111111
013213212112212212212112
01412212122201221111121
0151131111111102221111211
0162241112211102121111111
0172231111211102121111112
018213212122122121112211
0191130112111111122211
020351112211102121111222
0211351112211102121111112
02221211112211111111111
0231251112211101111111211
0242241112211102121111222
025341112211102221111112
026141112211102121111112
02722312111102221221111
0282241112211102221212221
0291351112021212221212211
03012111110212121212221
031142111221110222122022
032124111221110212111112
0331431112021102221111111
0341431112211102221221111
035143221122220122222222
0361321112222012221111111
0371321211221112221221111
038132122122220122222222
03912211121111111111111
040112111111111111111111
04123210111111111111111
042132012111102111111122
04321322121011201211111
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APPENDIX D
(continued)

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APPENDIX D

(continued)

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END DATA.

FREQUENCIES
/VARIABLES RACE AGE EDUCATE HEALTH LEGAL GYNECO CLINIC NOOFFICE TESTED
PAP EXPLAIN BENEFITS VACCINE SCREEN HUMAN CERVICAL HPV ACTIVE SAME
SEXUAL YOUNG AGREE
/STATISTICS=DEFAULT.

CROSSTABS
/TABLES=
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Cytology Proficiency Improvement Act of 2008 (H. R. 1237).


