January 2013

Factors Predicting Pap Smear Adherence in HIV-infected Women: Using the Health Belief Model

Crystal L. Chapman Lambert
University of South Florida, temerra84@gmail.com

Factors Predicting Pap Smear Adherence in HIV-Infected Women:

Using the Health Belief Model

by

Crystal L. Chapman Lambert

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
College of Nursing
University of South Florida

Co-Major Professor: Susan McMillan, Ph.D., ARNP
Co-Major Professor: Versie Johnson-Mallard, Ph.D., ARNP
Jeffrey Kromrey, Ph.D.
Donald Kurtyka, Ph.D., ARNP
Rasheeta Chandler, Ph.D., ARNP

Date of Approval:
March 29, 2013

Keywords: benefits, barriers, self-efficacy, susceptibility, seriousness

Dedication

I dedicate this dissertation to my son, Aiden, and my husband, Hartnel. Aiden has motivated me to maintain focus and complete my degree in a timely manner. I want to thank my husband for supporting me emotionally throughout this journey. I could not have completed my degree without your support, encouragement and motivation.

I want to thank my mom, Bridget Chapman, for always supporting and encouraging me to following my dreams. To my brother, thank you for your support and for making me feel like I am the best sister ever. Finally, through Jesus Christ all things are possible.

Acknowledgments

I would like to thank the members of my dissertation committee. I deeply appreciate the members of my committee: Drs. Susan McMillan, Versie Johnson-Mallard, Rasheeta Chandler, Don Kurtyka, Jeffrey Kromrey, and Mary Evans for their patience, encouragement and mentorship. As a result of their guidance, I have grown personally, professionally and academically.

I would like to express my gratitude to the staff at the researcher sites and the participants who patiently completed the questionnaire. I would like to thank Steve Palermo.

Financial support is vital. I would like to thank Sigma Theta Tau International Honor Society of Nursing for providing financial support for my dissertation. I will forever be grateful for the financial support provided by the Florida Education Fund (FEF). To the McKnight Doctoral Fellowship, I am eternally thankful for the emotional and spiritual support.

Every Thursday evening we provide support to one another. Thank you to Dr. Melissa Shelton, Marisa Belote, Jean Lucas, and Jessica Heckel.

Last but not least, to my family for their continued support and patience. I love you all.

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Abstract

Women infected with the human immunodeficiency virus are at increased risk for developing cervical cancer. Current guidelines reflect that Pap smears should be performed twice during the first year after diagnosis with HIV and annually thereafter. However, women with HIV are not obtaining Pap smears per the current guidelines. The purpose of this study was to evaluate HIV-infected women's attitudes toward cervical cancer and cervical cancer screening. The research design is an exploratory, cross-sectional, quantitative design. The sample of convenience consisted of participants recruited from two ambulatory HIV clinics in Florida. Attitudes were assessed using Champion's Health Belief Model and Self-efficacy scales. Knowledge was evaluated with an updated HPV/Cervical Cancer Knowledge scale. Sociodemographic variables were assessed using a Demographic Data form. The results indicate that HIV-infected women in the study were not knowledgeable about HPV or cervical cancer. They did not perceive that cervical cancer was serious, nor did they feel that they were susceptible to cervical cancer. Overall, HIV-infected women were confident in their ability to request a Pap smear, and they perceived fewer barriers and more benefits to Pap smears. Despite, perceptions of fewer barriers and more benefits a chart review revealed that approximately 43% of the study participants received a Pap smear during the past year. Perceived barriers was a significant predictor of Pap smear adherence (OR = 0.93, CI:

0.90 to 0.96, $p < .01$). Findings from the exploratory study provide important information to clinicians and researchers that will assist in the development of effective interventions to increase Pap test adherence. Additional research is needed to further understand factors that influence cervical cancer screening in this at-risk population.

Chapter One: Introduction

Human Immunodeficiency Virus (HIV)-infected women are at an increased risk for developing cervical dysplasia and cancer as a result of Human Papillomavirus (HPV) -infection (ACOG, 2010; Tello et al., 2010; Aberg et al., 2009) because of their compromised immune systems. The incidence and prevalence of HPV are high in HIV-infected women, especially those infected with high-risk types of HPV [11, 16, 18, 33, 51, 52, 53, 58 and 61] (De Vuyst, Lillo, Broutet & Smith, 2008; Clifford, Goncalves & Franceschi, 2006). It is estimated that 12,700 women develop cervical cancer annually, and approximately 4,200 women die as a result of cervical cancer (National Cancer Institute [NCI], 2011; American Cancer Society [ACS], 2011). The most common cause of cervical cancer is persistent infection with high-risk types of the HPV (NCI, 2011). Precancerous cells caused by HPV can develop into invasive cervical cancer if the body's immune system does not clear the virus, the precancerous cells are not detected or the precancerous cells are left untreated (NCI, 2011). In the early 1900s, cervical cancer was the leading cause of death in women but the introduction of Papanicolaou (Pap) testing drastically decreased mortality and morbidity rates secondary to cervical cancer (ACS, 2011). The Human Papillomavirus can be detected by HPV deoxyribonucleic acid (DNA) testing, and precancerous cells (cervical dysplasia) can be detected by Pap testing (NCI, 2011). Cervical cancer screening via Pap testing is the recommended screening tool for

detecting cervical dysplasia (ACS, 2011; NCI, 2011; The American College of Obstetrics and Gynecology [ACOG], 2010).

Persistent infection with HPV is common in women infected with HIV including high-risk types and infection with multiple types which increases the risk of progression to cervical cancer; thereby, making frequent Pap testing vital (De Vuyst et al., 2008; Clifford et al., 2006). Current ACOG guidelines suggest conducting Pap testing every six months during the first year after diagnosis or during the first year in care and annually thereafter in women infected with HIV (ACOG, 2010).

However, HIV-infected women are not receiving Pap testing according to the ACOG guidelines (Leece, et al., 2010). Studies have indicated that 19% to 25% of HIV-infected women had not received their annual Pap smear during the previous year (Rahangdale, Sarnquist, Yavari, Blumenthal & Israelski, 2010; Tello et al., 2010; Oster, Sullivan & Blair, 2009; Stein et al., 2001; Solomon et al., 1998), and about 75% had not received the second recommended Pap test during their first year in care (Logan, Khambaty, D'Souza & Menezes, 2010). Two other studies concluded that as many as 47% of HIV-infected women were not obtaining Pap smears annually (Baranoski et al., 2011; Bazargan, Bazargan, Farooq & Baker 2004). Many reasons have been cited for lack of Pap smear adherence.

Pain, lack of social support, lack of knowledge, lack of perceived susceptibility, and previous negative experiences with healthcare providers have been identified as factors associated with failure to adhere to Pap testing among women not infected with HIV (Daley et al., 2011; Ackerson, Pohl & Low, 2008; Austin, Ahmad, McNally & Stewart, 2002). Fear of cancer diagnosis and of discrimination, language barriers,

cultural beliefs, fatalistic attitudes and embarrassment were cited as factors that were seen as barriers to cervical cancer screening (Daley et al., 2011; Tracy, Lydecker & Ireland, 2010; Watts et al., 2009; Lee-Lin et al., 2007; Warren, Londono, Wessel & Warren, 2006; Austin et al., 2002). Age data were mixed (Tracy et al., 2010; Watts et al., 2009; Blackwell, Martinez & Gentleman, 2007; Lee-Lin et al., 2007; Datta et al., 2005; Hewitt, Devesa & Breen, 2004). Lack of insurance was documented as another factor that serves as a barrier (Daley et al., 2011; Peterson et al., 2008; Lee-Lin et al., 2007; Warren et al., 2006: Gorin & Heck, 2004; Hewitt et al., 2004). Being of a specific ethnic group and having less than high school education were associated with poor Pap test adherence (Tracy et al., 2010; Peterson et al., 2008; Blackwell et al., 2007; Coughlin, King, Richards & Ekwueme, 2006; Datta et al., 2005; Hewitt et al., 2004). Perceiving more barriers and fewer benefits was associated with poor adherence (Tracy et al., 2010). Transportation to the clinic was also cited as a factor (Daley et al., 2011). Obesity as determined by body mass index (BMI) was a documented barrier, but obesity data were mixed (Blackwell et al., 2007; Ferrante, Chen, Crabtree & Wartenberg, 2007; Datta et al., 2005).

Factors that were associated with poor adherence to cervical cancer screening in women infected with HIV include receiving a pelvic exam by a provider not managing the woman's HIV and low CD4+ T lymphocyte count (less than 200) (Baranoski et al., 2011; Rahangdale et al., 2010; Logan et al., 2010; Oster et al., 2009; Tello et al., 2008; Shah et al., 2006; Stein et al., 2001). Substance abuse, especially intravenous drug use, lack of child care, insufficient social support, and lack of knowledge were identified as factors that negatively affected Pap smear adherence in women infected with HIV (Logan

et al., 2010; Tello et al., 2010; Tello et al. 2008; Andrasik, Rose, Pereira & Antoni, 2008; Keiser et al., 2006). Negative attitudes toward providers, lack of providers' knowledge of current ACOG guidelines, poor provider-patient communication, extended wait times, lack of continuity of care, and discomfort during Pap test were identified as factors that hindered Pap testing in HIV-infected women (Logan et al., 2010; Andrasik et al., 2008; Bazargan et al., 2004). Economic barriers including lack of insurance, financial constraints, and lack of transportation influenced Pap testing (Tello et al., 2010; Tess & Hackley, 2010; Andrasik et al., 2008; Bazargan et al., 2004). Pap testing was affected by psychological barriers including fear of knowing the results, denial, depression and low self-esteem (Tello et al., 2010; Andrasik et al., 2008). Data regarding the association of age and Pap test adherence is mixed (Baranoski et al., 2011; Logan et al., 2010; Tello et al., 2010; Tello et al., 2008; Oster et al., 2009; Keiser et al., 2006; Shah et al., 2006; Bazargan et al., 2004). Having an HIV viral load of greater than 400 was associated with not obtaining a Pap smear during the previous year (Keiser et al., 2006; Shah et al., 2006). Having less education, inclement weather, and forgetting appointments were factors that negatively affect Pap smear adherence (Tello et al., 2010; Keiser et al., 2006). Not being white and being obese also were associated with poor Pap smear adherence in HIV-infected women (Tess & Hackley, 2010; Keiser et al., 2006; Tello et al., 2008; Bazargan et al., 2004).

Andrasik and colleagues (2008) interviewed HIV-infected African American women regarding barriers to cervical cancer screening, and several women reported having a lack of knowledge about reproductive health. During a thorough review of the literature, no studies were found that assessed knowledge of cervical cancer and Pap

testing in women infected with HIV. No studies were found that examined perceived self-efficacy in discussing cervical cancer screening with a healthcare provider or being able to request Pap testing. No studies have evaluated perceived susceptibility, perceived seriousness, perceived benefits, or perceived barriers to cervical cancer screening in HIV-infected women; therefore, making this proposed study unique and an important addition to the existent body of knowledge.

Purpose

The purpose of this study was to evaluate HIV-infected women's knowledge of and perceived susceptibility to cervical cancer, and their perception of the seriousness of cervical cancer. Further, the study assessed their perceived self-efficacy, benefits, and barriers to cervical cancer screening. In addition, predictors of cervical cancer screening in HIV-infected women were evaluated.

Specific Aims

Aim one. Evaluated the relationship between Pap test adherence and the following variables in: a) Champion's Health Belief Model Scale (CHBM) and b) Champion's Self-efficacy (CSE) scale and c) HPV/cervical cancer knowledge scale.

Aim two. Evaluated the relationships between the following variables in: CHBM, CSE, and knowledge scales, and selected sociodemographic variables.

Aim three. Assessed the ability of the variables in CHBM, CSE, and knowledge; and select sociodemographic variables to predict Pap testing.

Conceptual Framework

The Health Belief Model (HBM) provided the theoretical base for this study. The HBM was developed by psychologists in the U.S. Public Health Service in the 1950s as a

way to explain participation in medical prevention and disease detection programs (Glanz, Rimer & Viswanath, 2008 as cited in Hochbaum 1958; Rosenstock, 1960, 1974). The model was later expanded to explain the behavior of people in response to a medical diagnosis such as cancer (Glanz et al., 2008 as cited in Becker, 1974).

According to Glanz, Rimer and Viswanath (2008) the HBM predicts the reason(s) individuals take action to prevent, screen for and control illness; as in the case of Pap testing in HIV-infected women. The HBM has been used to explain behaviors such as tuberculosis screening, breast cancer screening, colon cancer screening, and risky sexual behaviors (Glanz et al., 2008). A person's beliefs, attitudes and perceptions about a disease determine their actions to seek methods to prevent, screen for and control a disease (Glanz et al., 2008). Intrapersonal factors such as knowledge, socio-economics issues and age influence health behaviors (Glanz et al., 2008). The constructs of the original HBM include perceived susceptibility, seriousness, benefits and barriers to a specific behavior with the addition of cues to action and health motivation in the 1970s and perceived self-efficacy in 1988. A valid instrument to measure cues to action does not exist, and the concept is difficult to study in a survey (Glanz et al., 2008). However, cues to action was evaluated in this study.

To help clarify the model, the definitions of the four original constructs, perceived susceptibility, perceived seriousness, perceived benefits and perceived barriers to a specific preventive action, are presented in the subsequent paragraph (Glanz et al., 2008). The HBM implies that an individual's perception of his/her susceptibility to a disease coupled with his/her belief that the disease has potentially serious consequences (perceived seriousness) equals the perceived threat which leads to a behavior such as Pap

testing. If the person believes that behaviors such as Pap testing are beneficial and outweigh his/her perceived barriers, then he/she is more likely to adopt the new behavior. The concept cues to action did appear in earlier diagrams of the HBM and it is considered as a modifying variable (Glanz et al., 2008). Cues to action are events, people or things that encourage people to change their behavior (Glanz et al., 2008). Examples of agents of cues to action include family, friends, media, and health care providers (Glanz et al., 2008). Other modifying variables include age, gender, ethnicity, personality, socioeconomics, knowledge and motivation (Glanz et al., 2008). Health motivation was introduced by Becker (1974) (as cited in Champion, 1984). Health motivation is a concern about health (Champion, Skinner & Menon, 2005; Champion, 1984). Self-efficacy was added to the original four concepts in 1988 (Glanz et al., 2008). Self-efficacy is an individual's belief that he/she can successfully accomplish a behavior (Bandura, 1977). In combination with perceived susceptibility and seriousness, a person must feel that he/she is capable of carrying-out a specific behavior and that the benefits of the behavior outweigh the barriers. In addition, cues to action such as reminder letters or reminder phone calls could lead to a specific outcome behavior. Figure 1.1 is a depiction of a modified version of the HBM (Glanz et al., 2008).

Theoretical Definitions

Perceived susceptibility. The belief of a person about his/her chances of getting a condition or disease (Glanz, Rimer and Viswanath, 2008).

Perceived seriousness. An individual's belief about the severity of a disease (Glanz et al., 2008).

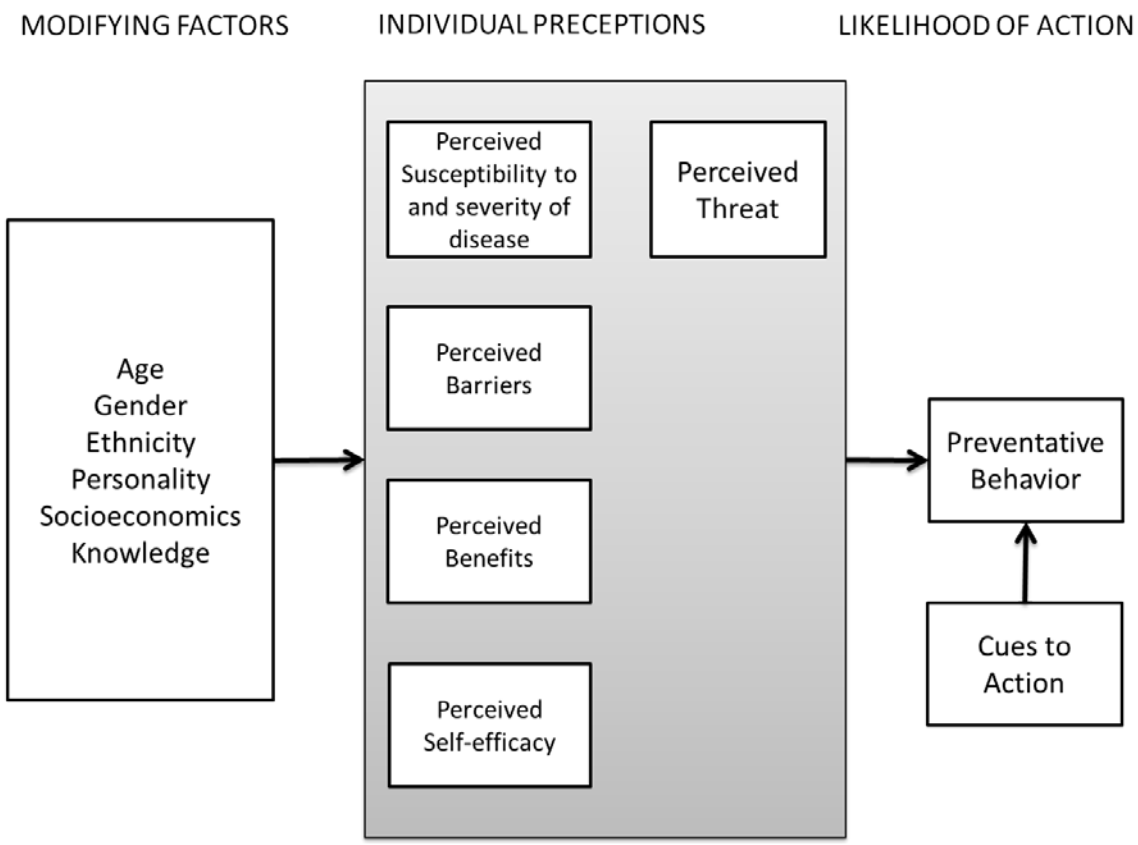

Figure 1 Modified Health Belief Model

Perceived benefits. A person's belief that the new behavior will reduce his/her risk of a disease (Glanz et al., 2008; Champion 1993)

Perceived barriers. The belief of a person about obstacles that may prevent them from a specific action (Glanz et al., 2008).

Perceived self-efficacy. A person's belief or confidence in his/her ability to take action or adapt a specific behavior (Glanz et al., 2008; Champion, Skinner & Menon, 2005).

Cues to action. Factors that will trigger a person to adopt a new behavior (Glanz et al., 2008).

Health motivation. A state of concern about general health issues (Champion, 1984).

HPV/Cervical cancer knowledge. The information that an individual knows about the causes, risk factors, mode of transmission, screening tools and methods of prevention regarding cervical cancer.

Adherence to guidelines. In 2010, the American College of Obstetrics and Gynecology (ACOG) developed guidelines for gynecologic care specific to women infected with HIV. The guidelines state that HIV-infected women must receive two Pap test the first year after diagnosis and then Pap testing every year (ACOG, 2010).

Significance

Infection with HPV increases HIV-infected women's risk of developing cervical dysplasia; particularly, if the virus is left untreated (ACOG, 2010; Tello et al., 2010; Aberg et al., 2009). A significant number of studies have established that certain barriers exist as failures to adhere to pap testing in the general population. However, limited research addresses factors affecting cervical cancer screening in HIV infected women. Clinicians could identify patients at risk for poor Pap test adherence with a better understanding of HIV-infected women's perception of their susceptibility and vulnerability to developing cervical cancer; in addition to, the benefits, barriers and knowledge of women infected with HIV, with regard to receiving cervical cancer screening. Based on the review of available research, clinicians are in need of information that can be used to identify factors affecting cervical cancer screening in HIV infected women.

Summary

Cervical cancer is caused by untreated cervical dysplasia or abnormal cervical cell changes which are commonly caused by HPV. Pap testing is the recommended screening tool to detect cervical cell changes. HIV-infected women have an increased risk of developing cervical cancer and ACOG has released recommended cervical cancer screening guidelines which are different from the guidelines of women not infected with HIV. HIV-infected women are not receiving Pap testing at the recommended intervals and numerous barriers to receiving Pap testing have been documented. A survey study was proposed to evaluate factors that influence cervical cancer screening in HIV-infected women. The proposed study may enhance the knowledge of clinicians caring for HIV-infected women and motivate researchers to assess interventions that will improve cervical cancer knowledge and awareness; as well as, eliminate or lessen barriers to cervical cancer screening. This research is important to clinicians, researcher and women infected with HIV.

Chapter Two: Literature Review

Note to Reader

Portions of the review of literature have been previously published (Chapman Lambert, 2012) and are utilized with permission of the publisher.

Chapter two of the dissertation proposal is a presentation of the review of literature concerning the human papillomavirus (HPV), cervical cancer, cervical cancer screening guidelines for HIV-infected women and sociodemographic factors that influence cervical cancer screening. In addition, information is presented about the perceived susceptibility, severity, benefits, barriers and self-efficacy to cervical cancer and cervical cancer screening. The information presented about HPV and cervical cancer was retrieved from the following websites: ACS, AIDS Healthcare Foundation, CDC, NCI and WHO. The following search engines were utilized to search for articles: CINAHL, PubMed and PsychINFO. Keywords in different combinations were used to retrieve articles: cervical cancer, screening, Pap smear, Pap test, prevention, barriers, HIV, AIDS, HBM, cervical dysplasia, and HPV. Additional articles were selected from the reference pages of studies identified in the initial search. The material presented builds a case for the significance of the proposed study.

Human Papillomavirus

HPV is a group of more than 150 types of the virus, of which 40 are known to be sexually transmitted (CDC, 2010b; NCI, 2011a). The 40 viruses that are sexually transmitted can cause genital warts or cervical cancer. An infected person can transmit these viruses to his/her partner(s) via vaginal, anal, or oral sexual intercourse in the absence of symptoms and while using condoms (CDC, 2010b; NCI, 2011a). Genital HPV infections are common and usually occur and resolve without symptoms after a few years (NCI, 2011a). Alarmingly, HPV is so common that about 50% of Americans will be infected at some time in their lives (NCI, 2011a). Persistent infection with HPV can cause precancerous cells (cervical dysplasia), and, when left untreated, cancers of the vagina, vulva, penis, anus, and oropharynx may develop (CDC, 2010b). Women infected with HIV are more likely to be infected with multiple types of HPV, are less likely to have the virus cleared by their weakened immune systems, and are more likely to develop cancer (Clifford, Goncalves, & Franceshi, 2006; De Vuyst, Lillo, Broutet, & Smith, 2008).

HPV Vaccines

In an effort to prevent cervical cancer, the U. S. Food and Drug Administration approved two vaccines, Gardasil® and Cervarix®. Both vaccines are effective against high-risk HPV types 16 and 18 (CDC, 2011). In addition, Gardasil® is effective against HPV types 6 and 11, which are responsible for most genital wart infections (CDC, 2011). Gardasil® is licensed for females and males ages 9 to 26 years and Cervarix® is licensed for females ages 9 to 26 years (CDC, 2011). The CDC (2011) recommends vaccine administration beginning at ages 11 or 12 years, with 9 years being the minimum age allowed. The CDC (2011) has emphasized that HPV vaccines do not cure or treat existing

infections, but women with a history of cervical dysplasia (abnormal Pap result) should receive the vaccine in accordance with the current CDC guidelines.

Cervical Cancer

Cervical cancer starts at the lower part of a woman's uterus (NCI, 2008). There approximately 15 types of high risk HPV, with HPV 16 and 18 being the most common, Persistent infections with high-risk HPV types can progress to cervical cancer (NCI, 2011a). Globally, more than 500,000 women have been estimated to be diagnosed with HPV-related cervical cancer annually with 80% of cases occurring in developing countries (WHO, 2011). The NCI (2011a) has predicted that each year more than 12,000 women in the United States will be diagnosed with HPV-related cervical cancer and more than 4,000 will die. Risk factors for cervical cancer, in addition to HPV, include using tobacco, being immune compromised, giving birth to three or more children, and being on oral contraception for more than 5 years (CDC, 2010a; NCI, 2011a). Women with early stage cervical cancer rarely have symptoms. It is not until the cancer progresses that women experience abnormal vaginal bleeding between menstrual periods, after intercourse, after menopause, or after pelvic examinations (NCI, 2011a). Cervical cancer screenings can detect abnormal cells or pre-cancerous cells early, allowing treatment to be initiated.

Cervical Cancer in HIV-Infected Women

Cervical cancer is considered an AIDS-defining cancer in individuals infected with HIV (AIDS Healthcare Foundation, 2008). Infection with HIV weakens the immune system leaving an individual vulnerable to a number of cancers (NCI, 2011b). The risk of cervical cancer in HIV-infected women is greater than the risk in uninfected women due

the immune system's limited ability to fight HPV (AIDS Healthcare Foundation, 2008; ACOG, 2010; NCI, 2011b). The introduction of effective antiretroviral therapy (ART) has decreased the incidence of Kaposi's sarcoma and non-Hodgkin's lymphoma, but ART has not decreased the incidence of cervical cancer, and the reason for this is not well understood (NCI, 2011b). Women co-infected with HIV and HPV, with HPV-related cervical cancer, and with CD4+ T lymphocyte counts less than 200 cells/mm^3 have a risk of poorer outcomes (AIDS Healthcare Foundation, 2008). Women with CD4+ T lymphocyte counts less than 50 cells/mm^3 are at higher risk of the cervical cancer returning after treatment (AIDS Healthcare Foundation, 2008).

Screening Guidelines in HIV-Infected Women

Routine cervical cancer screenings with Pap test and follow-up treatment reduces mortality in all women. Secondary to higher incidences of cervical cancer in women infected with HIV, screening guidelines for HIV-infected women differ in frequency from those of uninfected women. Women infected with HIV should receive two Pap tests the first year after diagnosis or during the first year in care, and annually thereafter (ACOG, 2010). According to Armas and colleagues (2007), HIV-infected women also should receive at least two cervical cancer screenings, 6 months apart, after changing sexual partners, and annually thereafter if the results are normal. Cervical cancer screening should begin at age 21 (ACOG, 2009). It is appropriate to discontinue screening after age 65 in women who have had three or more negative Pap test in a row and in women without a history of abnormal test results in the previous 10 years (ACOG, 2009). Women 65 years of age and older who are sexual active and have multiple sex

partners should continue to be screened per ACOG guidelines (ACOG, 2009). Clinicians should continue to conduct risk assessments after discontinuing screening (ACOG, 2009).

Factors that Influence Cervical Cancer Screening

Many factors that affect cervical cancer screening are common to all women, but there are factors that solely affect HIV-infected women. Factors such as age, tobacco use, weight, race/ethnicity, education, economics, and risky sexual behaviors have been cited as affecting cervical cancer screening in all women. Serologic values such as HIV viral load and CD4+ T lymphocyte count are factors unique to women infected with HIV.

Age. The majority of the articles agreed that older women were more likely to have poor Pap test adherence. A chart review of women ages 18 to 60 at a large urban HIV clinic revealed that older age was associated with inadequate Pap testing (Baranoski, Horsburgh, Cupples, Aschengrau, & Stier, 2011). Two hundred women attending the Johns Hopkins HIV clinic were surveyed about Pap test adherence and the results revealed that women 50 years of age and older were less likely to adhere to Pap testing (Tello et al., 2010). The Swiss HIV Cohort Study was developed to evaluate factors associated with frequency of gynecologic follow-up and cervical cancer screening. Older age was a predictor of fewer gynecologic examinations and Pap smears (Keiser et al., 2006). As age increased, women were less likely to receive a Pap test (Oster, Sullivan, & Blair, 2009). Although older age has been consistently linked to poor Pap test adherence, one study conducted in an HIV clinic in San Mateo, California from January 2002 to December 2006 did not find an association between age and Pap test adherence (Rahangdale, Sarnquist, Yavari, Blumenthal, & Israelski, 2010).

In uninfected women, age data consistently found that older age was associated with poor Pap test adherence. In a sample of 255 lesbian women, older age was a predictor of adherence to routine cervical cancer screening (Tracy, Lydecker, & Ireland, 2010). Women 30 years of age and older were less likely to report Pap smear screening in a study with 318 participants, ages 18 to 99 (Watts et al., 2009). Blackwell, Martine, and Gentleman (2007) conducted a secondary analysis using information from the Joint Canada/United States Survey of Health. The study examined Pap testing in Canadian and U.S. women during 2002 and 2003. Women ages 40 to 59 were less likely to be adherent to Pap testing than women ages 18 to 29. In women 40 years of age and older living in the southeastern United States, being 65 years of age or older was a factor that negatively influenced adherence to Pap testing (Peterson, Murff, Cul, Hargreaves, & Fowke, 2008). In 2005, using data from the National Health Interview Survey (NHIS), a sample of Latina women were surveyed about their use of Pap smears, and Latinas ages 50 years and older were less likely to have had a Pap test within the previous year (Gorin & Heck, 2005). Among 230 African-American and Latino women living in an urban housing development in Los Angeles County, women ages 45 years and older were less likely to have had a Pap smear within the 12 months before the study (Bazargan, Bazargan, Farooq, & Baker, 2004). Another study analyzed the NHIS data and concluded that women of various ethnicities 65 years of age were less likely to be receiving Pap testing (Hewitt, Devesa, & Breen, 2004). Among Appalachian women, Pap testing was less common in women ages 65 years and older (Hall, Uhler, Coughlin, & Miller, 2002). From the information reported here, it can be inferred that older women are less likely to receive Pap testing than younger women.

Ethnicity/race. Ethnicity data were not consistent. A chart review of a large urban HIV clinic concluded that being White or Hispanic increased the odds of not having had a Pap test (Baranoski et al., 2011). In a prospective chart review conducted at the Johns Hopkins HIV Clinic from January 2002 to April 2006, women who were African American were less likely to attend gynecological appointments than Caucasian women (Tello et al., 2008). Among the Swiss study cohort, being of non-White ethnicity was associated with fewer Pap smears (Keiser et al., 2006).

In uninfected women, being Black or African American has been shown to be a positive predictor of Pap test adherence (Bazargan et al., 2004; Blackwell et al., 2007; Hewitt et al., 2004; Peterson et al., 2008; Selvin & Brett, 2003). In a secondary analysis of the Southern Community Cohort Study, Peterson and colleagues (2008) examined Pap testing among women from low socioeconomic and education backgrounds. African American women had the highest cervical cancer screenings rates. In a sample of more than 5,000 U.S. women ages 18 years and older who participated in the Joint Canada/United States Survey of Health, non-Hispanic Black women were more likely to be compliant with Pap testing guidelines than non-Hispanic White women (Blackwell et al., 2007). Among the 13,745 women surveyed in the 2000 National Health Interview Survey, being African American relative to non-Hispanic White was associated with greater Pap test use (Hewitt et al., 2004).

Tobacco use. Among HIV-infected women, research has indicated that women who smoke cigarettes are more like to have poor Pap test adherence. Being a current smoker was a predictor of fewer gynecologic examinations and Pap smears (Keiser et al., 2006). An analysis of charts at Boston Medical Center found that HIV-infected women

who were current or former cigarette smokers had a decreased likelihood of having had a Pap test during 18 months of follow-up (Baranoski et al., 2011).

Among uninfected women, data regarding the association of poor Pap smear adherence and cigarette use were mixed. Two research studies determined that cigarette smokers were more likely to comply with cervical cancer adherence (Blackwell et al., 2007; Selvin & Brett, 2003). However, Hewitt and colleagues (2004) concluded that cigarette smokers were less likely to adhere to cervical cancer screening (Datta et al., 2006). Datta and colleagues (2006) analyzed data from the Black Women's Health Study, which included approximately 59,000 women from across the United States who ranged in age from 21 to 69. Smokers had a greater prevalence of non-adherence to Pap testing than nonsmokers (Datta et al., 2006). Hewitt and colleagues (2004) analyzed data from the 2000 NHIS, which included about 13,700 participants 18 years of age and older. Among women ages 25 to 44 years, being a former smoker was associated with greater Pap test use (Hewitt et al., 2004). An analysis of the 1998 National Health Interview Survey data revealed that current smokers were less likely to report a recent Pap test, which remained consistent across ethnicities (Selvin & Brett, 2003).

Weight. No U.S.-based studies were found that assessed the association between body mass index (BMI) and Pap test adherence in HIV-infected women. In the Swiss cohort, women who were underweight, which was defined as a BMI of less than 18 kg/m^2, were more likely to have had fewer Pap smears (Keiser et al., 2006. Being obese and having a BMI greater than 35 kg/m^2 were predictors of fewer Pap smears in women participating in the Swiss cohort study (Keiser et al., 2006).

More US-based studies have linked obesity to poor adherence to Pap testing in uninfected women; however, the data are mixed. Two studies found that obese women are less likely to participate in cervical cancer screening (Datta et al., 2006; Ferrante, Chen, Crabtree, Wartenberg, 2007). Women with a BMI of greater than 30 kg/m^2 were less likely than women with a BMI between 20 kg/m^2 and 29 kg/m^2 to adhere to Pap screening (Datta et al., 2006). Data from the 2000 National Health Interview Survey revealed that U.S. women ages 40 to 74 years with a BMI greater than 30 kg/m^2 were less likely to adhere to Pap smears (Ferrante et al., 2007). Two literature reviews using articles from 1990 through 2009 suggest that obesity negatively affected Pap screening in White women (Aldrich & Hackley, 2010; Cohen et al., 2008). In contrast, one study found no association between weight and adherence (Blackwell et al., 2008).

Education. Poor Pap test adherence was associated with having less than a high school education (Del Maso et al., 2010; Keiser et al., 2006; Tello et al., 2010). A cross-sectional study conducted in Northern Italy between July 2006 and June 2007 included 1,002 HIV-infected women. The goal of the study was to assess factors associated with adherence to cervical cancer screening during a one-year period. Women with less than a high school education were less likely to report having a Pap in the year before the questionnaire (Del Maso et al., 2010). Another study examined barriers to adherence to gynecologic care in 200 women at the Johns Hopkins HIV Clinic via survey. Having less than a high school education was associated with not having a Pap smear in the previous year (Tello et al., 2010). Among the Swiss cohort study participants, having less education, defined as less than completion of mandatory school, was a predictor of fewer gynecologic examinations and Pap smears.

Having less than a high school education was associated with lower Pap test adherence in uninfected women (Bazargan et al., 2004; Coughlin, King, Richards, & Ekwueme, 2006; Daley et al., 2011; Datta et al., 2006; Hewitt et al., 2004; Peterson et al., 2008; Selvin & Brett, 2003), but another study concluded that education had no effect on Pap test adherence (Blackwell et al., 2008). Twenty-one regional coordinators, health care providers, and administrators in the state of Florida were interviewed about patient barriers to cervical cancer screening, and they reported that low levels of education prevented women from adhering to cervical cancer screening (Daley et al., 2011). Among 19,000 women living in the southeastern United States, 30% had less than a high school education and 85% had not had a Pap test (Peterson et al., 2008). Having less than a high school education was associated with low Pap test adherence in roughly 250,000 women who participated in the Behavioral Risk Factor Surveillance System conducted between 2000 and 2002 (Coughlin et al., 2006). Having less than a high school education was strongly associated with poor Pap test adherence in nearly 60,000 women in the Black Women's Health Study (Datta et al., 2006). Pap testing rates were lower in women with less than a high school education in about 14,000 women of various ethnic backgrounds from across the United States (Hewitt et al., 2004). The association between having a lower level of education and poor Pap test compliance was statistically significant among 230 African American and Latino women living in three urban public housing communities in Los Angeles (Bazargan et al., 2004). Women with a bachelor's degree or higher were 2.5 times more likely than women with less than a high school education to report a recent Pap test, holding race/ethnicity constant (Selvin & Brett, 2003).

Economics. Economic issues, such as a patient's inability to pay for health services due to lack of insurance or lack of financial resources, have been found to contribute to patient reluctance to seek preventive care. In a study by Andrasik, Rose, Pereira, and Antoni (2008), African American HIV-infected women, between the ages of 18 and 49 years and living in Miami, who had no history of a Pap test in the 5 years before being interviewed, were asked questions to identify barriers to cervical cancer screening. Seventy-seven percent of the women reported an annual income of less than $10,000 and 80% reported being unemployed. Many of the women reported being frustrated with their experiences while seeking medical care without insurance and without the ability to pay for medications, services, gas, parking, or bus tickets to get to appointment, all of which, consequently, created barriers to cervical cancer screenings (Andrasik et al., 2008). A chart review of 200 women receiving care at a health department in Florida revealed that women who had not received a Pap test in their first year of HIV care were likely not to have had insurance (Logan, Khambaty, D'Souza, & Menezes, 2010). One study disagreed with this trend, however. Stein and colleagues (2001) used data from the HIV Cost and Service Utilization Study to examine the sociodemographic, clinical, and provider factors associated with screening for cervical cancer in HIV-infected women. The sample included 49,490 women from across the United States. Income and insurance status were not associated with receiving a Pap test (Stein et al., 2001). Data for uninfected women were mixed.

Many individuals cannot afford to pay for medical services, including Pap testing, because of lack of insurance and the ability to pay. One article reported that insurance had no effect on Pap testing among approximately 3,000 U.S. women participating in the

2002-2003 Joint Canada/United States Survey of Health (Blackwell et al., 2008). Although the data were mixed, most articles suggested that lack of insurance and inability to pay for services decreased the odds of HIV-infected women having had a Pap test per currently recommended guidelines (Bazargan et al., 2004; Daley et al., 2011; Hewitt et al., 2004; Peterson et al., 2008; Warren, Londono, Wessel, & Warren, 2006).

Risky behaviors. Former and current drug use was associated with poor Pap test adherence among 233 HIV-infected women receiving care at Boston Medical Center (Baranoski et al., 2011). When limiting the study to African American women attending the Johns Hopkins HIV Clinic, substance abuse was associated with not having a Pap smear in the previous year (Tello et al., 2010). In chart reviews of 1,086 women attending the Johns Hopkins HIV Clinic, Tello and colleagues (2008) revealed that illegal substance use decreased the odds of a woman showing up for HIV-gynecological appointments. Two hundred women attending a Florida county health department, who reported participating in high risk behaviors such as injection drug use, were less likely to have a documented Pap smear, but the association was not statistically significant (Logan et al., 2010). Being a current intravenous drug user was associated with fewer Pap smears in the Swiss cohort (Keiser et al., 2006). Women participating in a qualitative study in Miami reported that more urgent needs, such as substance use, took priority over getting screened for cervical cancer (Andrasik et al., 2008).

One study reported risky behavior as a barrier to cervical cancer screening in uninfected women. Regional coordinators, health providers and administers in 10 rural counties were interviewed regarding individual barriers to cervical cancer screening; they

reported that behaviors such as drug use and having multiple sexual partners were barriers (Daley et al., 2011).

HIV viral load. HIV viral load is the amount of virus in blood. Women with low viral loads are usually more compliant with care guidelines. Women in the Swiss HIV Cohort Study with viral loads lower than 400 copies/mL had had fewer Pap smears (Keiser et al., 2006). Tello and colleagues (2008) did not find a statistically significant association between viral load and Pap smear adherence but Tello and colleagues (2010) reported that not having a Pap test in the previous year was associated with viral loads of 50 copies/mL or greater. A viral load of greater than 10,000 copies/mL was reported to be associated with no Pap testing during an 18-month period (Baranoski et al., 2011).

CD4+ T lymphocyte count. Having a low (undetectable) CD4+ T lymphocyte count or a CD4+ T lymphocyte count lower than 200 copies/mL were associated with no Pap or poor Pap test adherence (Baranoski et al., 2011; Del Maso et al., 2010; Oster et al., 2009; Rahangdale et al., 2010; Tello et al., 2008). Only one study did not find a statistically significant relationship between lower CD4+ T lymphocyte counts and Pap test adherence (Keiser et al., 2006).

Champion's Health Belief Model Scale and Cervical Cancer

Several studies have used Champion's Health Belief Model (CHBM) scale to examine or predict factors associated with cervical cancer screening. This instruments measures perceived susceptibility, perceived seriousness, perceived barriers and perceived benefits. The research has been conducted in college women including nursing students, lesbians, and women over the age of forty. Champion's Health Belief Model scale has been translated and used to assess women in Iran, Thailand, and Korea. The

scale has not been used to assess women infected with HIV; therefore, the purposed research added to the existing body of knowledge.

Perceived susceptibility. Woman's perception of their susceptibility to cervical cancer varied. Ninety percent of Hispanic women participants felt that they were susceptible to cervical cancer but susceptibility was not associated with previously having a Pap test (Byrd, Peterson, Chavez & Heckert, 2004). In contrast, 209 Vietnamese women living in Texas did not perceive that they were at risk for cervical cancer (Ho, Yamal, Atkinson, Basen-Engquist, Tortolero-Luna & Follen, 2005). Seventy-nine percent of the Vietnamese women were married which could contributed to their low perceived risk of cervical cancer (Ho et al., 2005). A qualitative study involving, low-income African American and Hispanic women age fifty and older believed that all women who are sexually active are at risk for cervical cancer (Guilfoyle, Franco & Gorin, 2007). More than 80% of female students at a New England college believed that they were very unlikely to contract a sexually transmitted infection (STI) but only 40% believed that they were unlikely or very unlikely to develop cervical cancer (Burak & Meyer, 1997). About 70% of 189 Thai women believed they that would not develop cervical cancer or were not at risk (Boonpongmanee & Jittanoon, 2007). Only one Thai woman reported ever having a STI which could be the result of not being sexually, being educated or using condoms more frequently. Mean perceived susceptibility subscale score were 17.4 for college aged women attending a large Midwestern university which could be the result of high condom use, 66.7% of the participants having a Pap test with the past year or 77% of the participants not being smokers (Ingledue et al., 2004). Similar results were reported among 240 nursing students (Denny-Smith, Bairan & Page, 2006). Twenty-five

percent of women age forty to seventy believed that they were at risk for developing cervical cancer which may be attributed to more than fifty percent of the participants being married (Montgomery, Bloch, Bhattacharya & Montgomery, 2010).

In several studies, women who received Pap testing or intended to receive a Pap test had a greater perception of susceptibility for developing cervical cancer than those who had never had one or who had not had a pap test during the previous year (Ingledue, Cottrell & Bernard, 2010; Tracy, Lydecker & Ireland, 2010; Ben-Natan & Adir, 2009; Burak & Meyer, 1997). Despite higher scores for perceived susceptibility, many of the findings were not statistically significant for women who were screened routinely and those who were not (Ben-Natan & Adir, 2009; Montgomery, Bloch, Bhattacharya & Montgomery, 2009; Boonpongmanee & Jittanoon, 2007; Denny-Smith et al., 2006; Park, Chang & Chung, 2005; Burak & Meyer, 1997). In other studies there was no difference between groups (Parks et al., 2005; Allahverdipour & Emami, 2008). There was not a significant difference between women who had a Pap and women who did not but only twenty-two percent of the women reported having had a Pap test (Ben-Natan & Adir, 2009). Of the 108 lesbians, only 30.8 percent intended to be tested within the year but there was a significant difference between women who intended to be tested and women who had no intentions of receiving a Pap test (Ben-Natan & Adir, 2009). The previous study was conducted in Israelian women with 94.4% of the women reporting their relationship status as single and the article failed to report the perceived susceptibility scores (Ben-Natan & Adir, 2009). Among 225 lesbians in the Baltimore metro area, women who were not screened routinely had a greater perception of being susceptible to cervical cancer (Tracy et al., 2010). In many of the studies reviewed, perceived

susceptibility was not a great predictor of Pap testing; contrary, to other studies, knowledge and perceived susceptibility and severity were significant predictors of yearly Pap test among 428 college women at a large Midwestern university, but perceived susceptibility was not a good predictor alone (Ingledue et al., 2010). Boonpongmanee and colleague (2007) reported perceived susceptibility as one of three predictor of Pap testing.

Perceived seriousness. Some women seem to understand the seriousness of cervical cancer (Byrd et al., 2004; Burak & Meyer, 1997), but in several studies differences between groups (Pap vs. no Pap and intenders vs. non-intenders) were not significant, if a difference exist (Montgomery et al., 2010; Tracy et al., 2010; Ben-Natan & Adir, 2009; Boonpongmanee & Jittanoon, 2007; Denny-Smith et al., 2005; Park et al., 2005; Burak & Meyer, 2005: Byrd et al., 2004). Perceived seriousness (severity) scores were low ranging for 17 to 24 out of a possible 45 (Montgomery et al., 2010; Ho et al., 2009; Allahverdipour & Emami, 2008; Denny-Smith et al., 2005; Ingledue et al., 2004). Only two percent (4/206) Vietnamese women believed that cervical cancer is serious but the translations ask that women if they were afraid of cervical cancer which does not mean seriousness (Ho et al., 2005). Among college student at a large Midwestern university perceived seriousness was negatively correlated with knowledge (Ingledue et al., 2004) but in a similar study in college students at a large southeastern university, the inverse relationship was not significant. The southeastern study was conducted in nursing student who may have more knowledge about HPV and cervical cancer, but most the college women did not believe that cervical cancer was serious. In a study among women forty to seventy years of age using the same questionnaire as the previously

reported studies, found a positive relationship between knowledge and perceived seriousness but the internal consistency was low (α =0.20).

Contrary to previously reported studies, perceived seriousness differed between woman who had had a Pap over the past year, women who had had a Pap but not over the past year and women had never had a Pap (Ingledue et al., 2004). Non-routine, lesbian Pap screeners had a greater perception that cervical cancer was serious but their scores did not differ significantly from routine screeners (Tracy et al., 2010). Perceived seriousness scores were higher among the 225 self-identified lesbians than other studies, greater than thirty out of a possible forty-five (Tracy et al. 2010). Perceived seriousness does not appear to be a good predictor of cervical cancer screening.

Perceived barriers. Perceived barriers and benefits appear to be significant predictive variables related to Pap testing and risk behaviors such as condom use and number of sexual partners. It is difficult to separate the two variables, but we explained the literature regarding the two variables in separate paragraphs. Women who had a history of a previous Pap test perceived fewer barriers than those who did not report a history of a previous Pap test (Allahverdipour & Emami, 2008). Perceived barriers were cited as a significant predictor of having had a Pap test (Tracy et al., 2010; Allahverdipour & Emami, 2008; Lee et al., 2008; Boonpongmanee & Jittanoon, 2007; Ho et al., 2005). Procedural and cognitive barriers including feelings of embarrassment and shame and worrying about results were significantly less in the forty women in the experimental group (Park et al., 2005). Similarly, Park and colleagues reported fear of pain and embarrassment, partner disapproval and not knowing where to obtain a Pap test as factors associated with never having had a Pap test (Byrd et al., 2004).

Boonpongmanee and Jittanoon (2007) also reported embarrassment, fear and knowing where to obtain a Pap test as perceived barriers; in addition to, forgetting, being too busy and the cost of the test. The experimental group received one-one hour session which provided information about cervical cancer and Pap smear. Perceived barriers were a predictor for Pap testing in a Thailand study of 189 women ages twenty-five to fifty-five (Boonpangmanee & Jittanoon 2007).

Two qualitative studies reported barriers to Pap testing. Korean women in South Korea reported the following barriers: cost, lack of insurance, lack of time, language difficulties, fatalistic attitudes, embarrassment, lack of knowledge and being asymptomatic (Lee, 2000). Seven years later a similar study was conducted in New York in older women who reported the same barriers (Guilfoyle et al., 2007). Additionally, the researchers reported having a previous negative experience with a provider as a barrier. For example: providers not communicating results and having unnecessary exploratory procedures (Guilfoyle et al., 2007).

Perceived benefits. Women who had Pap tests were more likely to have the perception that the benefits outweighed the barriers (Tracy et al., 2010; Lee et al., 2008; Boonpangmanee & Jittanoon 2007; Ho et al., 2005; Burak & Meyer, 1997). Women who participated in an intervention aimed at increasing knowledge about cervical cancer and Pap test reported more benefits (Park et al., 2005). Four hundred undergraduate female students at a New England state college completed a survey and 104 reported that they had no intention of getting a Pap smear while 226 reported that they had not had one in the past six months but would be getting a Pap smear during the current year. The women who intended to get a Pap smear perceived more benefits than barriers and felt more

susceptible to developing HPV (Burak & Meyer, 1997). Likewise in a study among Korean women living in California, those who believed they had fewer benefits and more barriers had decreased odds of having had a Pap test (Lee, Fogg, Menon, 2008). In a study among young Hispanic women perceived benefits were not associated with having a pervious Pap test (Byrd et al., 2004). More benefits and fewer barriers were better predictors of having had a Pap test (Boonpangmanee & Jittanoon 2007; Burak & Meyer, 1997).

Knowledge

Two studies with the purpose of assessing knowledge of, perceived susceptibility to, perceived seriousness of and risk behaviors regarding HPV and cervical cancer were conducted in female college students, specifically nursing students in the first study. Both found no significant relationship between HPV/cervical cancer knowledge and perceived susceptibility (Denny-Smith, Bairan & Page, 2006; Ingledue, Cottrell & Bernard, 2004) but the two studies differed in its findings regarding the relationship between knowledge and seriousness. Among 240 bachelor's degrees seeking nursing students a significant positive relationship was not found between HPV/cervical cancer knowledge and perceived seriousness (Denny-Smith, Bairan & Page, 2006). Oddly, among 428 traditional student attending a large Midwestern university, a significant negative correlation was found between HPV/cervical cancer knowledge and perceived seriousness (Ingledue et al., 2004). The significant finding may be attributed to low levels of knowledge regarding HPV/cervical cancer, mean knowledge score 6.8/15 (Ingledue et al., 2004). Another study with the same purpose and utilizing the same instrument was conducted in women between the ages of forty and seventy found little to no relationship

between knowledge, perceived seriousness and perceived susceptibility (Montgomery, Bloch, Bhattacharya & Montgomery, 2010).

Knowledge was associated with Pap test adherence. Women who were more knowledge about cervical cancer were more likely to have had a Pap smear during a twelve month period (Ingledue et al., 2004). Women who knew that Pap test could detect cervical cancer early were five times more likely to have had a Pap test than women who were not knowledgeable (Lee at al., 2008). Three hundred and thirty-three Iranian women were surveyed using CHBM scale to assess for associations between HBM variables and participation in cervical cancer screenings. Pap test knowledge increased as perceived benefits to early detection increased and perceived susceptibility to cervical cancer increased (Allahverdipour & Emami, 2010).

Summary

The human papillomavirus (HPV) is a group of viruses that are sexually transmitted and if left undetected or untreated can lead to cancer. The most common cause of cervical cancer is HPV. Women infected with HIV are at an increased risk of acquiring HPV and developing cervical cancer. Cervical cancer screening guidelines for HIV-infected women require Pap testing more frequently. Many HIV-infected women do not adhere to cervical cancer screening regardless of the current ACOG guidelines. A review of literature has uncovered many cited factors that are barriers to cervical cancer screening in women and more specifically HIV-infected women. These barriers include older age, ethnicity/race, weight, tobacco use, level of education, economics, risky sexual behavior, high HIV viral load and low CD4+ T lymphocyte count.

The studies found pertinent information that could be the foundation for future interventions domestically and internationally and in various women from lesbians to married women to college women involved in risky sexual behavior. The proposed study was critical because the population being evaluated consists of women who are at a greater risk for developing cervical dysplasia and cervical cancer secondary to being immune compromised and having a history of being involved indirectly or directly in risky sexual behavior. Further, this study measured perceived self-efficacy to cervical cancer screening using CSE scale: therefore, making this aspect of the proposed study unique.

Chapter Three: Method

The methods section describes the research design, the study participants, sampling procedure, sample size, measures used for data collection, procedure for collecting data and method of data analysis. Figure 1 illustrated a conceptual model of the concepts evaluated in the study.

Design

The study is an exploratory, cross-sectional, quantitative correlational design. A correlational design was selected because the researcher is exploring relationships among variables. The dependent or outcome variable is adherence to cervical cancer screening using Pap testing. The design allowed the researcher to predict the outcome variable using multiple independent variables.

Population/Setting

Participants were recruited from the waiting rooms of two health department's HIV ambulatory care center located in central Florida. The clinics were selected because they served patients infected with HIV and Acquired Immune deficiency Syndrome (AIDS). The clinic serves more than 1,000 patients annually, of whom, about 400 are women. The reported cases of HIV from 1983 to June 2011 by race/ethnicity for the rural county are as follows: 56% were Black/African American women, 31% were White, 11% were Hispanic (all races), one percent was identified as multi-race and less than one

percent was identified as American Indian/Native American or Native Hawaiian/Pacific Islander. The clinic is staffed with one medical doctor and two advanced registered nurse practitioners (ARNP). The specialties of the medical doctor include: internal medicine, pediatrics, and infectious disease. The specialties of the ARNPs include: family health, adult health and infectious disease.

Sample

A convenience sample drawn from the patient population at the study site was used. Inclusion criteria were as follows: the participants must be women, 18 years of age or older, and patients of the clinic to participate. Women with a history of having had a hysterectomy and women who cannot read and comprehend the English language were excluded from the study. Each woman received a $15 Walmart gift card as compensation for her time.

Power analysis was conducted for Pearson's r using a small (0.2) effect size assuming power = .80 and $\alpha = .05$. The analysis indicated that the sample size needed was 192. Also a power analysis was conducted using an effect size of (0.3) assuming power = .8 and $\alpha = .05$ and the sample size needed was 83. For analysis of variance (ANOVA) assuming power = .80 and $\alpha = .05$, the sample size needed for a medium effect (0.5) was 64 women in each group for a total of 128 women. A power analysis for multiple logistic regression using a tolerance of .60, assuming power = .80 and $\alpha = .05$ and a assuming an odds ratio of at least two indicated a sample of size of 276. Although the power analysis for multiple regression indicated sample size of 276, the desired sample size for the study was n=300. Over sampling by 24 participants was done to

account for missing data in the event that a small percentage of the participants elected not to answer every question.

Instruments

Six scales, one demographic questionnaire, four questions and one chart review questionnaire were used in the proposed study. The scales are described in the following paragraphs.

Demographic questionnaire. The demographic questionnaire was developed by the researcher. The questionnaire included 20 questions regarding age (not date of birth), race/ethnicity, marital status, primary language, education level, CD4+ T lymphocyte count, HIV viral load, hysterectomy history, height, weight, cigarette use, substance use, Pap test history, number of sexual partners, condom use and year of HIV diagnosis. The demographic questionnaire was done in two parts: part one was a medical record review completed by the primary investigator and part two was completed by the participant. The questions were selected based on the review of related literature.

Champion's Health Belief Model scale. Perceived susceptibility, perceived seriousness (severity), perceived benefits, and perceived barriers were measured using an adapted version of Champion's Health Belief Model (CHBM) (1984) scale for cervical cancer and Pap test. Champion's Health Belief Model scale consists of four sub-scales. The four sub-scales, totaling 28-items, are measured with a 5-point Likert-like scale ranging from strongly agree to strongly disagree (Guvenc et al., 2011; Champion, 1998). Reported internal consistency for perceived susceptibility, seriousness and barriers is .70 and above (Guvenc et al., 2011; Medna-Shepherd & Kleier, 2010; Champion, 1984). Internal consistency for perceived benefits varied ranging from .62 to .80 (Guvenc et al.,

2011; Medna-Shepherd & Kleier, 2010; Champion, 1999, Champion, 1984). Test-retest reliability coefficients for the perceived benefits, barriers, seriousness and susceptibility have ranged from .65 to .88 (Guvenc et al., 2011; Medna-Shepherd & Kleier, 2010; Champion, 1999, Champion, 1984). Construct validity for perceived benefits, barriers, seriousness and susceptibility was examined by factor analysis and most of the items loaded on their perspective factors at .35 and above (Guvenc et al., 2011; Medna-Shepherd & Kleier, 2010; Champion, 1999, Champion, 1984).

Champion's self-efficacy scale. Self-efficacy (confidence) were measured using Champion's Self-Efficacy (CSE) (2005) scale, which consisted of ten questions. The scale is measured with a 5-point Likert-like scale ranging from strongly agree to strongly disagree (Champion, Skinner & Menon, 2005). The CSE scale has not been widely utilized in research. The scale has a Cronbach's alpha of .87 and a Pearson's coefficient of .52 for test-retest reliability.

HPV/Cervical cancer knowledge. Human papillomavirus and cervical cancer knowledge was measured by fifteen-multiple choice questions. The questionnaire was developed by Ingledue and colleagues (2004). The original scale consisted of 40-items measuring HPV and cervical cancer knowledge, perception and preventive behaviors. For the purposes of this study, the first 15-items measuring HPV and cervical cancer was used. Each question has one correct response. The possible range of scores is from zero to fifteen and higher scores equate to more knowledge (Denny-Smith et al., 2006; Ingledue et al., 2004). Content validity for the knowledge portion of the test was determined by a panel consisting of two gynecologists, two professors of health education, and a medical professional from the Breast and Cervical Program (Ingledue et

al., 2004). Test-retest reliability for knowledge was .90 (Ingledue et al., 2004). Internal consistency for the knowledge scale was not reported.

Cues to action. Cues to action was evaluated with one question, developed by the researcher. The question assessed triggers that encouraged women to get a Pap smear.

Data Collection

Data collection began after the study was approved by the Florida Department of Health's Institutional Review Board (IRB) (Appendix A). Participants were recruited from the waiting room of a local health department's HIV ambulatory care clinic. To reduce the risk of identifying the participants, the researcher requested a waiver of documentation of consent because the consent form would be the only document identifying the patient by name. Each participant was given an informed consent cover letter, a survey and an envelope. The informed consent cover letter informed the participants that their involvement was voluntary and would not influence the care they received (Appendix B). The participant implied consent to the study by completing the survey. Each survey was assigned a unique identifier. The unique identifier was written on the top of both surveys. The unique identifier allowed the researcher to match the participant's completed survey to the chart review questionnaire.

Data collection occurred in two phases. Phase one consisted of a self-administered survey completed by the participant (Appendix C). The survey could be completed in 45 minutes or less. Phase two consisted of a review of the participant's chart by the researcher (Appendix D). The chart review was completed while the participant was completing the self-administered survey. After completing the questionnaire, the participant showed the survey to the researcher who reviewed it for completeness. If the

questionnaire was not complete, the participant was given an opportunity to answer any incomplete questions. At that time, the researcher gave the participant a $15 Walmart gift card as compensation for her time. The surveys was placed in an envelope and locked in a secure office in a locked cabinet. In addition, completed surveys were scanned and saved to a password-protected flash drive. The original documents were shredded after the documents are scanned. The data will be maintained for 5 years as per DOH IRB policy.

Data Analysis

The data were analyzed using SPSS statistical software (Version 21). Descriptive statistics were used to describe sample characteristics and Pap smear adherence. Means and standard deviations were calculated for perceived susceptibility, seriousness, barriers, benefits and self-efficacy, in addition to HPV and cervical cancer knowledge. Pearson's correlation coefficients were calculated to assess the relationship within the HBM variables and between the demographic. Analysis of variance (ANOVA) was used to determine whether mean differences exist for perceived susceptibility, seriousness, barriers, benefits and self-efficacy and knowledge between women who report having had a Pap test during the past year and women reporting not having had a Pap test during the past year. Multiple logistic regression was used to determine whether the perceived susceptibility, seriousness, barriers, benefits, self-efficacy and knowledge predict cervical cancer screening adherence. Also multiple logistic regression was used to determine whether age, race/ethnicity/ marital status, primary language, education level, CD4+ T lymphocyte count, HIV viral load, BMI, tobacco use, substance use, history of abnormal

Pap test, number of sexual partners, condom use and year of HIV diagnosis are predictors of cervical cancer adherence.

Summary

The proposed study was an exploratory, cross-sectional, quantitative correlational design with the purpose of evaluating HIV-infected women's knowledge of and perceived susceptibility to cervical cancer, and their perceived seriousness of developing cervical cancer, as well as assessing their perceived self-efficacy, benefits, and barriers and health motivation to cervical cancer screening. In addition, the relationship between select demographic factors and cervical cancer screening were evaluated. The women were recruited from two specialty care clinics in central Florida. The sample was one of convenience with the expectation of having a sample of 300. The following instruments were used: CHBM and CSE scales and HPV/cervical cancer knowledge scale by Dr. Sandmaire. The validity and reliability of the previously stated instruments were assessed in published articles. The participants were given a questionnaire with a consent form. The researcher collected the consent form, which contained the patient's unique identifier. The researcher reviewed the questionnaire for completeness and the participant placed the questionnaire in an envelope. After completing the questionnaire, a $15 Walmart gift card was given. Then, the data was analyzed using SPSS version 21.

Chapter Four: Results

The purpose of this study was to evaluate HIV-infected women's knowledge of and perceived susceptibility to cervical cancer, and their perception of the seriousness of developing cervical cancer, as well as assessing their perceived self-efficacy, benefits, and barriers to cervical cancer screening. In addition, predictors of cervical cancer screening in HIV-infected women were evaluated. Chapter four presents the results from the pencil and paper survey, which consisted of a participant survey and chart review survey. The chapter results are presented in five sections. Section one presents descriptive statistics of health-related behaviors, socio-demographic, clinical and subscale variables. Section two presents data related to the relationships between Pap test adherence (participant reported and chart review), and the following subscales: CHBM, CSE and HPV knowledge using ANOVA. In section three, the relationships between the following subscale variables: CHBM, CSE and HPV knowledge scales, and select demographic variables using ANOVA and Pearson's correlations are presented. Multiple logistic regression results between Pap test adherence (participant reported and chart review) and potential predictor variables are presented in section four. Section five presents Cronbach's alpha values to evaluate internal consistency of study instruments. In addition, the relationship between sources of last Pap smear reported and the relationship between sources of having a history of an abnormal Pap smear.

Sample Characteristics

The sample consisted of 300 participants, who were recruited from two (one rural and the other metropolitan) ambulatory HIV care clinics in Florida. The majority of participants were Black (70.3%). Ethnicity was categorized as African American (68%), Hispanic-Latina (14%), Caucasian (16.3%), and other (1.7%). The majority of participants had at least a high school education (Table 1).

Table 1. Frequency and Percent of Participants by Sociodemographic Variables.

Variables	Frequency	Percent
Race		
Black	211	70.3
White	89	29.7
Ethnicity		
African American	204	68.0
White (non-Hispanic)	49	16.3
Hispanic/Latina	42	14.0
Other	5	1.7
Education		
Less than high school	99	33.0
High school/trade school	151	50.3
College	50	16.7
Primary Language		
English	260	86.7
Spanish	24	8.0
Creole	15	5.0
Other	1	0.3
Marital status		
Single	163	54.3
Divorced	50	16.7
Married	48	16.0
Significant other	22	7.3
Widowed	17	5.7

Note. $n = 300$.

Approximately 50% of the women reported smoking cigarettes. The majority of the participants denied a history of current or past substance use. About half of the women reported being sexual activity with one partner. The majority of women reported using condoms at least 75% of the time (Table 2).

Table 2. Frequency and Percent of Participants by Risky Behavior Variables.

Variables	Frequency	Percent
Cigarette use[a]		
No	152	50.7
Yes	148	49.3
Currently	106	71.6
Formerly	42	28.4
Substance use[a]		
No	242	80.7
Yes	58	19.3
Currently	7	11.7
Formerly	53	88.3
Condom use[a]		
Never	42	14.0
25%	11	3.7
50%	13	4.3
75%	29	9.7
100%	165	55.0
I don't want to answer	40	13.3
Number of sex partners[a]		
0	96	32.0
1	161	53.7
2 or more	29	9.7
I don't want to answer	14	4.7
Sexual activity[b]		
Currently active	151	50.3
Not active	142	47.3
Never	6	2.0
Missing	1	0.4

Note: $n^a = 300$, $n^b = 299$.

All of the women had a diagnosis of HIV, but 48.4% of the women had an AIDS diagnosis. A review of medical charts revealed that less than half of the women were diagnosed with depression. The majority of women reported having a Pap smear during the past year. However, a review of their medical charts revealed that approximately 56% of the women had not had a Pap smear during the past year. Approximately half of the women reported not having a history of an abnormal Pap smear, and the medical chart revealed similar results (Table 3).

Table 3. Frequency and Percent of Participants by Clinical Variables.

Variables	Frequency	Percent
Medical chart review		
Last Pap smear[a]		
< 1 year	131	43.7
> 1 year	169	56.3
History of abnormal Pap[c]		
Yes	115	38.3
No	169	56.3
Missing	16	5.4
History of depression[a]		
Yes	129	43.0
No	171	57.0
Diagnosis[a]		
HIV	155	51.7
AIDS	145	48.3
Participant-reported		
Last Pap smear[a]		
< 1 year	224	74.7
> 1 year	76	25.3
History of abnormal Pap[b]		
Yes	150	50.2
No	149	49.8

Note: $n^a = 300$, $n^b = 299$, $n^c = 284$.

The participants' ages ranged from 18 to 70 years old, with a mean age of 45.36 (SD=11) (Table 4). 35.5 % of the women were 50 years old, 7.7% of women were 60 years of age or greater and 10% were 29 years of age or younger. Eighty percent of women were recruited from a metropolitan HIV ambulatory clinic and 20% from a rural HIV ambulatory clinic.

Perceived susceptibility measured women's perceived susceptibility to cervical cancer, and perceived susceptibility scores were low. Perceived seriousness included seven questions that were used to measure women's perception of the severity of cervical cancer. In general, women perceived that Pap smears were beneficial ($M = 15.93$). Champion's perceived barriers subscale measured women's perceived barriers to

obtaining a Pap smear, and scores were low (*M* = 29.26). HPV/cervical cancer knowledge scores were low with a mean of 6.02. Height and weight were collected for each participant, and used to calculate BMI. Ideal BMI range is 18.5 – 24.9, and overall the women in this study were overweight (*M* = *29*.25) (Table 4).

Table 4. Means and Standard Deviation for Subscales, Age and BMI for all Participants.

Variables	Range	Mean	Standard Deviation
Age	18 - 70	45.36	11.00
Perceived Susceptibility	4 - 20	9.59	4.06
Perceived Benefits	4 - 20	15.93	3.20
Perceived Seriousness	7 - 35	20.88	6.12
Perceived Self-efficacy	10 - 50	40.22	6.98
Perceived Barriers	14 -56	29.16	9.09
BMI	15 - 55.91	29.25	7.85
Knowledge	0 - 14	6.02	3.59

Note: n=300.

Aim One

Aim one was to evaluate the relationships between Pap test adherence in women infected with HIV and the following variables: a) CHBM scales, b) CSE scale, and c) HPV/cervical cancer knowledge scale. Outcome variables were created from two questions on the questionnaire: participant reported last Pap smear was categorized as either had a Pap during the past year or no Pap smear, and medical chart review last Pap smear was separated into either had a Pap during the past year or no Pap smear.

Participant reported Pap smear. A one-way ANOVA was used to examine differences in subscale variables by participant reported Pap smear. There were differences between the following subscale variables (knowledge, susceptibility, seriousness and benefits) and participant reported Pap smear, but the differences were not statistically significant. Differences in perceived barriers ($p > .001$; $\eta^2 = .016$) and self-

efficacy ($p = .029$; $\eta^2 = .051$) by Pap smear adherence were statistically significant. Women who reported a Pap smear during the past year had higher perceived self-efficacy scores and lower perceived barrier scores than women who reported having a Pap smear greater than one year ago (Table 5).

Table 5. Differences in Subscale Scores by Participant Reported Pap Smear.

	Pap	***M***	***SD***	***F***	***df***	***p***	η^2
Knowledge	<1year[a]	5.89	3.74				
	>1year[b]	6.39	3.08	1.11	(1,298)	.293	.004
Susceptibility	<1year[a]	9.65	4.23				
	>1year[b]	9.38	3.51	0.26	(1,298)	.611	.001
Seriousness	<1year[a]	20.63	6.37				
	>1year[b]	21.59	5.28	1.40	(1,298)	.239	.005
Benefits	<1year[a]	16.05	3.23				
	>1year[b]	15.55	3.07	1.40	(1,298)	.239	.005
Barriers	<1year[a]	27.96	9.01				
	>1year[b]	32.67	8.46	15.95	(1,298)	.000	.051
Self-efficacy	<1year[a]	40.73	7.32				
	>1year[b]	38.71	5.60	4.83	(1,298)	.029	.016

Note. $n^a = 224$, $n^b = 76$.

Medical chart documented Pap smear. ANOVA (one-way) was used to determine differences in subscale variables by medical chart documented Pap smear. The analysis revealed that differences in subscale variables by medical chart documented Pap smear were small. The relationships between medical chart-documented last Pap smear and the subscale variables were not statistically significant (Table 6).

Table 6. Differences in Subscale Scores by Medical Chart Reported Pap Smear.

	Pap	*M*	*SD*	*F*	*df*	*p*	η^2
Knowledge	<1year[a]	6.11	3.60				
	>1year[b]	5.95	3.59	0.16	(1,298)	.689	.001
Susceptibility	<1year[a]	9.66	4.28				
	>1year[b]	9.53	3.89	0.08	(1,298)	.772	.000
Seriousness	<1year[a]	20.95	6.28				
	>1year[b]	20.82	6.02	0.04	(1,298)	.847	.000
Benefits	<1year[a]	15.79	3.54				
	>1year[b]	16.03	2.91	0.40	(1,298)	.527	.001
Barriers	<1year[a]	29.70	9.22				
	>1year[b]	28.45	8.93	1.404	(1,298)	.237	.005
Self-efficacy	<1year[a]	40.33	7.86				
	>1year[b]	40.13	6.23	0.06	(1,298)	.801	.000

Note. [a]*n*= 131, [b]*n* = 169, Total *n* = 300.

Aim Two

Aim two was to evaluate relationships among the subscales (CHBM, CSE, and knowledge scales) and select demographic variables in HIV-infected women. Pearson's correlation was used to evaluate the relationship between continuous variables. ANOVA was used to assess the relationship between a continuous and a categorical variable.

Sociodemographic. The associations between the subscale variables and the following sociodemographic variables are presented: race, education, marital status, and language. No statistically significant relationships were revealed between the subscale variables (CHBM, CSE, and HPV knowledge) and marital status (Table 7). Statistically significant relationships were found between subscale variables and the following variables: race, education and language.

Table 7. Differences in Subscale Scores by Marital Status.

	Marital Status	***M***	***SD***	***F***	***df***	***p***	η^2
Knowledge	Single[a]	5.98	3.47	2.02	(4, 295)	.09	.03
	Significant other[b]	7.68	3.06				
	Married[c]	6.08	4.13				
	Divorced[d]	5.92	3.54				
	Widowed[e]	4.47	3.47				
Susceptibility	Single[a]	9.39	4.03	0.70	(4, 295)	.59	.01
	Significant other[b]	9.50	4.48				
	Married[c]	10.46	4.30				
	Divorced[d]	9.58	3.48				
	Widowed[e]	9.12	4.81				
Seriousness	Single[a]	20.63	6.22	0.86	(4, 295)	.49	.01
	Significant other[b]	19.82	4.92				
	Married[c]	21.96	5.48				
	Divorced[d]	21.48	6.17				
	Widowed[e]	19.77	7.98				
Benefits	Single[a]	15.83	3.46	0.97	(4, 295)	.42	.01
	Significant other[b]	16.68	2.64				
	Married[c]	16.25	2.94				
	Divorced[d]	15.96	2.79				
	Widowed[e]	14.82	2.94				
Barriers	Single[a]	30.00	9.78	1.33	(4, 295)	.26	.02
	Significant other[b]	29.77	7.57				
	Married[c]	28.88	8.01				
	Divorced[d]	26.70	8.37				
	Widowed[e]	28.35	8.51				
Self-efficacy	Single[a]	39.50	7.11	1.09	(4, 295)	.36	.02
	Significant other[b]	40.36	5.31				
	Married[c]	41.58	7.55				
	Divorced[d]	41.04	6.13				
	Widowed[e]	40.71	8.07				

Note. $n^a = 163$, $n^b = 22$, $n^c = 48$, $n^d = 50$, $n^e = 17$, Total n = 300.

Race and language. Using ANOVA, statistically significant relationships were found between perceived susceptibility and race, and perceived self-efficacy and primary language spoken. White women perceived themselves to be more susceptible than black women to cervical cancer (p <.001) (Table 8). Using Tukey's HSD (honestly significant difference) post hoc test, pairwise differences were revealed. Women who spoke English had higher self-efficacy scores than women who spoke Spanish (p = .035) (Table 9).

Table 8. Differences in Subscale Scores by Race.

	Race	***M***	***SD***	***F***	***df***	***p***	η^2
Knowledge	Black[a]	5.88	3.58	1.11	(1, 298)	.29	.00
	White[b]	6.36	3.61				
Susceptibility	Black[a]	8.98	3.94	16.94	(1, 298)	<.001	.05
	White[b]	11.03	3.98				
Seriousness	Black[a]	20.76	6.48	0.27	(1, 298)	.60	.00
	White[b]	21.16	5.22				
Benefits	Black[a]	16.12	3.28	2.70	(1, 298)	.10	.01
	White[b]	15.46	3.00				
Barriers	Black[a]	28.64	9.32	2.35	(1, 298)	.13	.01
	White[b]	30.39	8.47				
Self-efficacy	Black[a]	40.44	7.22	0.68	(1, 298)	.41	.00
	White[b]	39.71	6.38				

Note. $n^a = 211$, $n^b = 89$. Total n = 300.

Education. Using ANOVA, statistically significant differences exist in knowledge, and perceived benefits, barriers and self-efficacy by education. Using Tukey's HSD post hoc test, women with less than a high school education had lower perceived self-efficacy scores than women with a high school diploma (p = .019), and women with a college education (p = .002). Women with less than a high school education perceived more barriers than women with a college education (p =.014). Women with less than a high school education perceived fewer benefits to Pap testing

than women with a high school diploma ($p < .001$), and women with a college education ($p = .001$). Women with a college education had higher knowledge scores than women with less than a high school education ($p < .001$) and women with a high school education ($p = .012$) (Table 10).

Table 9. Differences in Subscale Scores by Primary Language Spoken.

	Language	***M***	***SD***	***F***	***df***	***p***	η^2
Knowledge	English[a]	6.10	3.60	0.53	(2, 296)	.59	.00
	Creole[b]	5.80	3.65				
	Spanish[c]	5.33	3.60				
Susceptibility	English[a]	9.42	4.06	2.58	(2, 296)	.08	.02
	Creole[b]	9.40	4.07				
	Spanish[c]	11.38	3.85				
Seriousness	English[a]	20.87	6.20	0.00	(2, 296)	.99	.00
	Creole[b]	20.67	5.58				
	Spanish[c]	20.92	5.90				
Benefits	English[a]	16.00	3.02	0.83	(2, 296)	.44	.01
	Creole[b]	15.20	5.05				
	Spanish[c]	15.38	3.65				
Barriers	English[a]	28.65	8.75	2.23	(2, 296)	.06	.02
	Creole[b]	31.47	11.20				
	Spanish[c]	32.88	10.70				
Self-efficacy	English[a]	40.67	6.57	3.90	(2, 296)	.02	.03
	Creole[b]	38.07	10.35				
	Spanish[c]	37.00	7.92				

Note. $n^a = 260$, $n^b = 15$, $n^c = 24$, Total n = 299.

Age. Bivariate correlations were computed to determine if an association exists between the subscale variables and age. A statistically significant weak, negative correlation exists between HPV knowledge and age; therefore, as age increases knowledge decreases ($r = -.292$, $p < .001$). Statistically significant relationships were revealed between perceived susceptibility and age ($r = -.140$, $p = .015$) and perceived

self-efficacy and age (r = -.155, p = .007). As age increases perceived susceptibility and self-efficacy decreases (Table 21).

Table 10. Differences in Subscale Scores by Education.

	Education	*M*	*SD*	*F*	*df*	*p*	η^2
Knowledge	< High school[a]	5.22	3.26	8.02	(2, 297)	<.001	.05
	High school[b]	6.01	3.50				
	College[c]	7.66	3.98				
Susceptibility	< High school[a]	9.99	4.08	0.74	(2, 297)	.48	.01
	High school[b]	9.36	4.02				
	College[c]	9.46	4.14				
Seriousness	< High school[a]	21.57	6.36	1.01	(2, 297)	.36	.01
	High school[b]	20.64	6.10				
	College[c]	20.24	5.68				
Benefits	< High school[a]	14.71	3.58	11.68	(2, 297)	<.001	.07
	High school[b]	16.46	2.89				
	College[c]	16.74	2.57				
Barriers	< High school[a]	30.86	9.80	4.09	(2, 297)	.02	.03
	High school[b]	28.94	8.70				
	College[c]	26.44	8.24				
Self-efficacy	< High school[a]	38.32	7.42	6.85	(2, 297)	<.001	.04
	High school[b]	40.73	6.36				
	College[c]	42.44	7.08				

Note. $n^a = 99$, $n^b = 151$, $n^c = 50$, Total n = 300.

Risky behavior. For the purpose of this study risky behaviors consist of the following variables: cigarette use, substance use, condom use, number of sexual partners, and sexual experience or activity. This section presents data about statistically significant relationships between the subscale variables and the risky behavior variables. No statistically significant relationship was revealed between the subscales variables (CHBM, CSE, and HPV knowledge) and substance use (Table 11).

Cigarette use. The relationship between perceived susceptibility and cigarette use was statistically significant. Although not statistically significant, women who reported a history of cigarette use felt that cervical cancer was more serious, and they were more

knowledgeable about cervical cancer and HPV. The women were less confident in requesting a Pap smear, and they felt that there were more benefits and fewer barriers to screening than women without a history of cigarette use (Table 12).

Table 11. Differences in Subscale Scores by Substance Use.

	Substance use	***M***	***SD***	***F***	***df***	***p***	η^2
Knowledge	Yes[a]	6.36	3.06	0.64	(1, 298)	.43	.00
	No[b]	5.94	3.71				
Susceptibility	Yes[a]	10.26	3.89	1.98	(1, 298)	.16	.01
	No[b]	9.43	4.09				
Seriousness	Yes[a]	21.62	4.83	1.06	(1, 298)	.30	.00
	No[b]	20.70	6.39				
Benefits	Yes[a]	15.78	2.33	0.16	(1, 298)	.69	.00
	No[b]	15.96	3.37				
Barriers	Yes[a]	30.36	9.29	1.26	(1, 298)	.26	.00
	No[b]	28.87	9.05				
Self-efficacy	Yes[a]	38.69	5.95	3.49	(1, 298)	.06	.01
	No[b]	40.59	7.16				

Note. $n^a = 242$, $n^b = 58$, Total n = 300.

Table 12. Differences in Subscale Scores by Cigarette Use.

	Cigarette use	***M***	***SD***	***F***	***df***	***p***	η^2
Knowledge	Yes[a]	6.11	3.59	0.19	(1, 298)	.66	.00
	No[b]	5.93	3.79				
Susceptibility	Yes[a]	10.12	4.25	4.88	(1, 298)	.03	.02
	No[b]	9.08	3.81				
Seriousness	Yes[a]	21.27	5.97	1.21	(1, 298)	.27	.00
	No[b]	20.49	6.27				
Benefits	Yes[a]	15.92	2.96	0.00	(1, 298)	.97	.00
	No[b]	15.93	3.42				
Barriers	Yes[a]	29.22	8.65	0.01	(1, 298)	.91	.00
	No[b]	29.10	9.54				
Self-efficacy	Yes[a]	39.94	6.67	0.47	(1, 298)	.49	.00
	No[b]	40.49	7.28				

Note. $n^a = 148$, $n^b = 152$, Total n = 300.

Condom use. A statistically significant difference in perceived barriers and HPV knowledge existed across levels of condom use ($p = .035$, $\eta^2 = .04$; $p = .046$, $\eta^2 = .038$, respectively). No statistically significant pairwise differences were revealed for perceived barriers using post hoc testing. Tukey's HSD post hoc test revealed a statistically significant relationship in HPV knowledge between women who reports using condoms 75% of the times in comparison to women who did not want to report their condom usage ($p = .027$). It should be noted that women who reported using condoms 75% of the time had the highest mean knowledge scores (Table 13).

Number of sex partners. A statistically significant differences were found between perceived self-efficacy and HPV knowledge by of number of sexual partners ($p = .047$, $\eta^2 = .027$; $p = .027$, $\eta^2 = .030$). Post hoc testing for perceived self-efficacy did not reveal any statistically significant pairwise differences. Tukey's post hoc test revealed that women who reported not having any sexual partners during the past 12 months had lower knowledge scores than women who reported having two or more partners during the past year (Table 14).

Sexual experience. Statistically significant relationships exist between sexual experience and specific subscale variables (perceived self-efficacy and HPV knowledge). Using Tukey's HSD post hoc test, women who reported no sexual activity during the past 12 months had higher perceived self-efficacy scores than women who reported having sex during the past 12 months ($p < .001$). Women who reported having sex during the past 12 months had higher self-efficacy scores than women who reported never having sexual intercourse ($p < .001$). Women who reported no sexual activity during the past 12 months

had higher knowledge scores than women who reported never having sexual intercourse (p = .032) (Table 15).

Table 13. Differences in Subscale Scores by Condom Use.

	Condom use	*M*	*SD*	*F*	*df*	*p*	η^2
Knowledge	Never[a]	5.90	3.68	2.29	(5, 294)	.046	.038
	25%[b]	6.00	3.32				
	50%[c]	4.77	2.62				
	75%[d]	7.52	3.68				
	100%[e]	6.18	3.51				
	IDWTA[f]	4.85	3.81				
Susceptibility	Never[a]	9.45	3.94	0.94	(5, 294)	.454	.016
	25%[b]	8.82	3.34				
	50%[c]	11.61	3.36				
	75%[d]	10.21	3.65				
	100%[e]	9.48	4.13				
	IDWTA[f]	9.28	4.51				
Seriousness	Never[a]	19.90	6.99	0.73	(5, 294)	.596	.012
	25%[b]	20.18	4.47				
	50%[c]	23.23	6.00				
	75%[d]	21.72	4.98				
	100%[e]	20.87	6.00				
	IDWTA[f]	20.73	6.88				
Benefits	Never[a]	15.67	3.36	0.49	(5, 294)	.786	.008
	25%[b]	16.45	2.62				
	50%[c]	15.31	3.22				
	75%[d]	15.41	3.41				
	100%[e]	16.01	3.23				
	IDWTA[f]	16.30	2.95				
Barriers	Never[a]	30.57	8.61	2.44	(5, 294)	.035	.040
	25%[b]	29.45	7.94				
	50%[c]	34.62	8.71				
	75%[d]	31.86	10.57				
	100%[e]	27.81	8.56				
	IDWTA[f]	29.40	10.17				
Self-efficacy	Never[a]	39.74	6.45	1.48	(5, 294)	.198	.024
	25%[b]	36.73	10.55				
	50%[c]	39.08	6.06				
	75%[d]	39.59	6.66				
	100%[e]	41.08	6.63				
	IDWTA[f]	38.98	7.98				

Notes. $n^a = 42$, $n^b = 11$, $n^c = 13$, $n^d = 29$, $n^e = 165$, $n^f = 40$, Total n = 300, IDWTA = I don't want to answer

Table 14. Differences in Subscale Scores by Number of Sexual Partners.

	Number of Sex partners	***M***	***SD***	***F***	***df***	***p***	η^2
Knowledge	Zero[a]	5.39	3.59	3.10	(3, 296)	.027	.030
	One[b]	6.23	3.58				
	Two[c]	7.45	3.24				
	IDWTA[d]	5.07	3.60				
Susceptibility	Zero[a]	9.44	3.95	2.20	(3, 296)	.089	.022
	One[b]	10.02	4.21				
	Two[c]	8.52	3.50				
	IDWTA[d]	7.86	3.55				
Seriousness	Zero[a]	20.40	6.89	0.662	(3, 296)	.576	.007
	One[b]	21.32	5.77				
	Two[c]	20.59	5.35				
	IDWTA[d]	19.71	6.22				
Benefits	Zero[a]	15.64	3.70	1.01	(3, 296)	.390	.010
	One[b]	16.22	3.01				
	Two[c]	15.59	2.73				
	IDWTA[d]	15.29	2.27				
Barriers	Zero[a]	30.26	10.00	2.00	(3, 296)	.114	.020
	One[b]	28.37	8.46				
	Two[c]	27.93	9.01				
	IDWTA[d]	33.21	8.87				
Self-efficacy	Zero[a]	38.76	7.50	2.69	(3, 296)	.047	.027
	One[b]	40.77	6.83				
	Two[c]	42.31	5.69				
	IDWTA[d]	39.57	5.94				

Note. $n^a = 96$, $n^b = 161$, $n^c = 29$, $n^d = 14$, Total n = 300, IDWTA = I don't want to answer.

Clinical variables. For the purpose of this study clinical variables consist of BMI, CD4+ T lymphocyte count, HIV viral load, encouragement, depression, and history of abnormal Pap smear (participants-reported and medical chart documented). This section presents data about relationships between subscale variables and clinical variables. The relationship between depression and the subscale variables was not

Table 15. Differences in Subscale Scores by Sexual Experience.

	Sexual Activity	***Mean***	***SD***	***F***	***df***	***p***	η^2
Knowledge	Currently active[a]	6.56	3.63	5.04	(2, 296)	.007	.033
	Not active[b]	5.63	3.47				
	Never[c]	2.83	2.32				
Susceptibility	Currently active[a]	9.78	4.09	0.31	(2, 296)	.735	.002
	Not active[b]	9.41	4.04				
	Never[c]	9.67	4.27				
Seriousness	Currently active[a]	21.09	5.58	0.17	(2, 296)	.092	.001
	Not active[b]	20.68	6.56				
	Never[c]	20.67	9.56				
Benefits	Currently active[a]	16.14	2.86	2.41	(2, 296)	.092	.016
	Not active[b]	15.82	3.47				
	Never[c]	13.33	4.08				
Barriers	Currently active[a]	28.41	8.38	2.14	(2, 296)	.119	.014
	Not active[b]	29.69	9.54				
	Never[c]	35.33	14.25				
Self-efficacy	Currently active[a]	40.99	6.50	11.19	(2, 296)	<.01	.070
	Not active[b]	39.93	6.75				
	Never[c]	27.83	12.43				

Note: $n^a = 151$, $n^b = 142$, $n^c = 6$, Total n = 300.

statistically significant (Table 16). The relationship between CD4+ T-lymphocyte and the subscale variables was not statistically significant (Table 21).

HIV viral load. Women with low viremia (VL <500) perceived more benefits to cervical cancer screening than women with high viremia ($p=.032$, $\eta^2 = .015$). However, ANOVA is not robust against unequal group size when the assumption of homogeneity has been violated. Welch's adjust F ratio was utilized, and the difference between HIV

Table 16. Differences in Subscale Scores by Medical Chart Documented History of Depression.

	Depression	***Mean***	***SD***	***F***	***df***	***p***	η^2
Knowledge	Yes[a]	6.08	3.41	0.05	(1, 298)	.821	.000
	No[b]	5.98	3.72				
Susceptibility	Yes[a]	9.74	4.09	0.34	(1, 298)	.560	.000
	No[b]	9.47	4.04				
Seriousness	Yes[a]	21.53	5.92	2.63	(1, 298)	.106	.001
	No[b]	20.38	6.25				
Benefits	Yes[a]	15.57	3.13	2.90	(1, 298)	.090	.015
	No[b]	16.20	3.23				
Barriers	Yes[a]	29.85	9.29	1.30	(1, 298)	.256	.005
	No[b]	28.64	8.94				
Self-efficacy	Yes[a]	39.38	6.38	3.31	(1, 298)	.070	.014
	No[b]	40.85	7.35				

Note: $n^a = 129$, $n^b = 171$, Total n = 300.

viral load and perceived benefits is not statistically significant, Welch's F(1, 74.84) = 3.46, p = .067. Women with low viremia had higher perceived self-efficacy scores than women with high viremia (p =.042, $\eta^2 = .014$). Differences between HIV viral load and the following subscale variables: knowledge, susceptibility, seriousness, and barriers were not statistically significant (p = .554, p = .211, p = .720, respectively) (Table 17).

Encouragement. Women who reported being encouraged by providers to get a Pap smear had higher HPV knowledge scores than women who reported that they were not encouraged. Perceived self-efficacy and benefit scores were higher for women who reported being encouraged than for women who reported that they were not encouraged by providers. The differences were statistically significant, but ANOVA is not robust when the assumption of homogeneity is violated in the presents of unequal group size, so Welch's F ration was calculated. Welch's adjusted F ratio was obtained for perceived

benefits and self-efficacy, [Welch's F(1, 41.89) = 10.47, p = .002; Welch's F(1, 40.00) = 12.78, p = .001, respectively] (Table 18)

Table 17. Differences in Subscale Scores by HIV Viral Load.

	HIV Viral load	*Mean*	*SD*	*F*	*df*	*p*	η^2
Knowledge	Low viremia[a]	6.04	3.56	0.02	(1, 298)	.892	.000
	High viremia[b]	5.97	3.77				
Susceptibility	Low viremia[a]	9.55	4.13	0.13	(1, 298)	.720	.000
	High viremia[b]	9.76	3.76				
Seriousness	Low viremia[a]	20.98	6.08	0.35	(1, 298)	.554	.001
	High viremia[b]	20.45	6.33				
Benefits	Low viremia[a]	16.12	3.01	4.63	(1, 298)	.032	.015
	High viremia[b]	15.12	3.82				
Barriers	Low viremia[a]	28.83	9.00	1.57	(1, 298)	.211	.005
	High viremia[b]	30.50	9.47				
Self-efficacy	Low viremia[a]	40.62	6.54	4.15	(1, 298)	.042	.014
	High viremia[b]	38.55	8.42				

Note: n^a = 242, n^b = 58, Total n = 300. Barriers: Welch's F(1, 74.84) = 3.46, p = .067.

Table 18. Differences in Subscale Scores by Encouragement by Providers.

	Encouragement	*M*	*SD*	*F*	*df*	*p*	η^2
Knowledge	Yes[a]	6.43	3.46				
	No[b]	4.03	3.51	15.56	(1, 219)	<.01	.051
Susceptibility	Yes[a]	9.67	4.00				
	No[b]	9.60	4.52	0.01	(1, 291)	.914	.000
Seriousness	Yes[a]	21.14	6.00				
	No[b]	19.90	6.48	1.37	(1, 291)	.242	.005
Benefits	Yes[a]	16.17	2.97				
	No[b]	13.95	4.02	16.37	(1, 291)	<.01	.053
Barriers	Yes[a]	28.95	8.93				
	No[b]	31.00	10.50	1.62	(1, 291)	.204	.006
Self-efficacy	Yes[a]	40.95	6.12				
	No[b]	34.92	10.00	26.02	(1, 291)	<.01	.082

Note. [a]*n*= 256, [b]*n* = 37, Total *n* = 293. Benefits: Welch's F(1, 41.89) = 10.47, p = .002. Self-efficacy: Welch's F(1, 40.00) = 12.78, p = .001.

Participant-reported history of abnormal Pap. Women who reported having a history of an abnormal Pap smear perceived themselves to be more susceptible to cervical cancer, and they perceived cervical cancer to be more serious than women without a history of having an abnormal Pap smear. Women who reported having a history of an abnormal Pap smear perceived more benefits and fewer barriers to Pap smears than women without a history of having an abnormal Pap smear. Women who reported having a history of an abnormal Pap smear had higher perceived self-efficacy and knowledge scores than women who denied having a history of an abnormal Pap smear (Table 19).

Table 19. Differences in Subscales Scores by Participant Reported History of Abnormal Pap Smear.

	Abnormal Pap	*M*	*SD*	*F*	*df*	*p*	η^2
Knowledge	Yes[a]	6.68	3.63	9.88	(1, 297)	.002	.032
	No[b]	5.40	3.43				
Susceptibility	Yes[a]	10.58	4.15	18.85	(1, 297)	<.01	.060
	No[b]	8.60	3.74				
Seriousness	Yes[a]	21.60	5.70	4.12	(1, 297)	.043	.014
	No[b]	20.17	6.48				
Benefits	Yes[a]	16.39	2.80	6.72	(1, 297)	.010	.022
	No[b]	15.44	3.50				
Barriers	Yes[a]	27.62	8.16	8.47	(1, 297)	.004	.028
	No[b]	30.64	9.74				
Self-efficacy	Yes[a]	41.75	6.19	15.03	(1, 297)	<.01	.048
	No[b]	38.69	7.42				

Note. [a]*n*= 150, [b]*n* = 149, Total *n* = 299.

Medical chart documented history of abnormal Pap. Medical records were reviewed for history of an abnormal Pap smear. Participants whose charts indicated a history of an abnormal Pap smear had higher perceived susceptibility than women whose charts did not reflect a history of an abnormal Pap smear, differences were statistically significant (p = .008) (Table 20).

Table 20. Differences in Subscale Scores by Medical Chart Document History of Abnormal Pap smear.

	Abnormal Pap	*M*	*SD*	*F*	*df*	*p*	η^2
Knowledge	Yes[a]	6.31	3.88	1.62	(1, 282)	.204	.006
	No[b]	5.76	3.42				
Susceptibility	Yes[a]	10.31	4.26	7.15	(1, 282)	.008	.025
	No[b]	9.00	3.92				
Seriousness	Yes[a]	21.43	5.93	1.41	(1, 282)	.236	.005
	No[b]	20.54	6.38				
Benefits	Yes[a]	16.30	2.81	2.15	(1, 282)	.144	.008
	No[b]	15.72	3.50				
Barriers	Yes[a]	28.62	8.52	0.50	(1,282)	.479	.002
	No[b]	29.40	9.59				
Self-efficacy	Yes[a]	40.91	7.37	1.91	(1, 282)	.167	.007
	No[b]	39.72	6.94				

Note: $n^a = 115$, $n^b = 169$, missing = 16, Total n = 284.

BMI. Bivariate correlations were used to determine relationships between BMI and the subscale variables. A statistically significant but weak correlation between BMI and perceived benefits exists ($r = .127$, $p = .027$); therefore, women with a higher BMI perceived more benefits. A weak but statistically significant correlation between BMI and perceived barriers exists ($r = -.118$, $p = .041$), so women who perceive more barriers had a lower BMI (Table 21).

Aim Three

Logistic regression was used to assess the ability of the subscale variables (CHBM, CSE, and HPV knowledge) and select demographic factors to predict Pap testing among women infected with HIV. The outcome variables were participant-reported Pap smear and medical chart documented Pap smear. Predictors were selected from existing literature.

Table 21. Pearson's Correlations for Age, CD4 Count, and Subscale Variables.

Variables	1	2	3	4	5	6	7	8	9
Age (1)	1								
CD4 Count (2)	.155**	1							
Susceptibility (3)	-.140*	-.009	1						
Seriousness (4)	-.036	.006	.368**	1					
Benefits (5)	-.002	.035	-.054	.130*	1				
Self-efficacy (6)	-.155**	.057	-.039	.005	.534**	1			
Barriers (7)	.038	-.094	.284**	.290**	-.191**	-.455**	1		
Knowledge (8)	-.292**	-.036	.094	.076	.157**	.297**	-.176**	1	
BMI (9)	-.042	.265**	-.064	-.013	.127*	.098	-.118*	.040	1

Note. n = 300. p = < 0.01**, p < 0.05*.

For participant-reported last Pap smear, all variables were entered into the initial equation and perceived barriers was significant, p = .006, OR = .944. A backward stepwise approach was taken in eliminating potential predictor variables that were not significant. The following predictors were retained in the analysis: perceived susceptibility, perceived barriers, age, CD4+ T lymphocyte count, family history and HPV knowledge The results revealed that last CD4+ T lymphocyte count and perceived barriers and susceptibility were statistically significant predictors of participant-reported last Pap smear (p = .046, p <.001, and p = .004, respectively). Perceived barriers and last CD4+ Tlymphocyte count are statistically significant predictors when they are the only two variables in the equations, p = .000, OR = 0.946, 95% CI [0.918 – 0.975]; p = .002, OR = 1.002, 95% CI [1.001 – 1.002] (Table 22).

Table 22. Multiple Logistic Regression of Participant Reported Pap Smear.

Model	β	Error	Sig.	O.R	95% C.I.for O.R.	
					Lower	Upper
Susceptibility	.081	.039	.041	1.084	1.003	1.171
Barriers	-.072	.017	<.001	.930	.899	.963
Age	.005	.014	.713	1.005	.979	1.032
CD4 Count	.001	.000	.004	1.001	1.000	1.002
Family history	.326	.372	.381	1.386	.668	2.876
Knowledge	-.052	.052	.320	.950	.858	1.052
Constant	1.692	1.032	.101	5.431		

Note. n = 300, Family history = participant knowing that family history of cervical cancer is a risk factor. Model (likelihood ratio) $\chi^2 = 32.15$, $p < .01$. Nagelkerke $R^2 = .15$.

For medical chart documented last Pap smear, all variables were entered into the initial equation and no predictors were revealed. Using the same predictors used to predict participant reported Pap smear, the following predictors: perceived susceptibility, perceived barriers, age, CD4+ T lymphocyte, family history and HPV knowledge were used in the analysis. CD4+ T lymphocyte was a statistically significant predictor of medical chart-reported last Pap smears ($p = .038$), but the full model was not statistically different from the null model, a model without predictors ($p = .392$). Therefore there are no predictors for medical chart documented Pap smear (Table 23).

Cronbach's Alpha

Cronbach's alpha was calculated for the following subscales: perceived susceptibility, benefits, barriers, seriousness and self-efficacy. Perceived susceptibility and self-efficacy scales had excellent internal consistency ($\alpha > .90$). The internal

consistency for perceived seriousness, perceived barriers and the knowledge scales was good. The perceived benefits scale had a Cronbach's alpha that is interpreted as acceptable (Table 24).

Table 23. Multiple Logistic Regression of Medical Chart Documented Pap Smear.

Model	β	Error	Sig.	O.R	95% C.I. for O.R.	
					Lower	Upper
Susceptibility	.017	.031	.575	1.018	.958	1.081
Barriers	-.015	.014	.293	.985	.959	1.013
Age	-.001	.012	.934	.999	.977	1.022
CD4 Count	.001	.000	.038	1.001	1.000	1.002
Family history	-.029	.303	.923	.971	.536	1.758
Knowledge	.004	.043	.928	1.004	.923	1.092
Constant	-.439	.875	.616	.645		

Note. n = 300, Family history = participant knowing that family history of cervical cancer is a risk factor. Model (likelihood ratio) $\chi^2 = 6.29$, p = .392. Nagelkerke $R^2 = .28$.

Table 24. Reliability of Subscales.

Subscales	Number of items	Cronbach's Alpha	Interpretation
Perceived Susceptibility	4	.92	Excellent
Perceived Seriousness	7	.85	Good
Perceived Benefits	4	.72	Acceptable
Perceived Barriers	14	.89	Good
Perceived Self-efficacy	10	.92	Excellent
		KR-20	
HPV Knowledge	15	.81	Good

Pap Smear by Source

The outcome variable for the current study was Pap smear adherence, but there were two possible sources for last Pap smear, participant-reported and medical chart documented. The number of women who had not received a Pap smear during the past year nearly doubled when the source changed from participant to medical chart (Table 4). McNemar test (*S*) was performed to assess the relationship between medical chart documented last Pap smear and participant-reported last Pap smear because the two variables are correlated. The relationship was statistically significant, *S* (1, N= 300) = 74.9, p <.001. Women who reported having a Pap smear during the past year were more likely to have a Pap smear documented in their medical chart. Women who reported having a Pap smear greater than 1 year ago were more likely to have a Pap smear documented in their chart greater than 1 past year ago (Table 25).

Table 25. Crosstabs Table of Pap Smear by Source

	Pap Smear Participant reported		*S*	ϕ
Medical Chart	Yes	No		
Yes	121	10	74.9**	.36**
No	103	66		

Note. n = 300. ** = p < .001.

Abnormal Pap Smear by Source

Information regarding history of having an abnormal Pap smear was obtained from the participant and the medical chart. McNemar test (*S*) was performed to assess the relationship between medical chart documented and participant-reported history of having an abnormal Pap smear because the two variables are correlated. The majority of women who reported not having a history of an abnormal Pap smear were the same

women who did not have a documented history of an abnormal Pap smear. Approximately 28% of the women's response did not match their medical chart (Table 26).

Table 26. Crosstabs Table of History of an Abnormal Pap Smear by Source

History of Abnormal Pap Smear			**S**	**ϕ**
	Participant reported			
Medical Chart	Yes	No		
Yes	87	28	7.62*	.43**
No	54	114		

Note. n = 283. * = p < .01. ** = p < .001.

Chapter Five: Discussion

HIV-infected women are at increased risk for developing cervical dysplasia and cancer as a result of HPV-infection (ACOG, 2010; Tello et al., 2010; Aberg et al., 2009); However, HIV-infected women are not receiving Pap testing according to ACOG guidelines (Leece et al., 2010). Approximately 25% of HIV-infected women had not received their annual Pap smear during the previous year (Rahangdale, Sarnquist, Yavari, Blumenthal & Israelski, 2010; Tello et al., 2010; Oster, Sullivan & Blair, 2009; Stein et al., 2001; Solomon et al., 1998). Many reasons have been cited to explain poor test adherence such as age, race/ethnicity, tobacco use, weight, education, ability to pay, risky behaviors, HIV viral load, CD4-lymphocyte count, and perceived susceptibility, seriousness, benefits, and barriers. Currently, the literature is lacking a comprehensive study evaluating relationships between Pap test adherence and numerous cited variables; thus, useful information for clinicians is needed to help them identify women at risk for poor adherence to cervical cancer screening.

The purpose of the study was to evaluate HIV-infected women's knowledge of cervical cancer and HPV, perceived susceptibility to cervical cancer, and their attitudes regarding the severity of cervical cancer. Further, the study assessed the women's perceived self-efficacy, benefits, and barriers to cervical cancer screening. In addition, predictors of cervical cancer screening in HIV-infected women were evaluated. This

chapter discusses the findings of the study in light of existing literature, states limitations and strengths of the study, offers recommendations for future research, and discusses implications for practice. The study determined the following: a) the relationships between the Health Belief Model subscale variables and Pap smear adherence, b) the relationships between the subscale variables and selected demographic factors, and c) the ability of the subscale variables and demographic factors to predict Pap smear adherence. Results differed based the source of data about on Pap smear (participant-reported versus medical chart documented).

Sample Characteristics

The current study had the lowest mean knowledge score (6.02) compared to data reported in existing studies (Denny-Smith, Bairan & Page, 2006; Ingledue et al., 2004; Montgomery, Bloch, Bhattacharya & Montgomery, 2010). About half (50.3%) of the women in the current study reported having a high school diploma, and 33% reported having less than a high school education. Three previous studies used the HPV/cervical cancer knowledge questionnaire in samples of college women, nursing students and women ages 40 – 70 (Denny-Smith, Bairan & Page, 2006; Ingledue et al., 2004; Montgomery, Bloch, Bhattacharya & Montgomery, 2010). The highest mean knowledge score was in female nursing students (n = 240, M = 10.2, range of 1 -15) (Denny-Smith, Bairan & Page, 2006). The majority, 71 – 100 %, of participants in the other studies had some college which may account for the difference in knowledge scores. Further studies are needed to determine the effect of level of education on health literacy. .

Women in the study did not feel susceptible to cervical cancer (M = 9.59, range 4-20), nor did they think that cervical cancer was serious (M = 20.88, range 7 – 35).

Numerous studies have used Champion's HBM scales to evaluate perceived susceptibility and severity to cervical cancer, but for unknown reasons, items were added or deleted. Despite the various score ranges, women in earlier studies did not feel they were susceptible to cervical cancer (Allahverdipour & Emami, 2008; Boonpongmanee & Jittanoon, 2007; Burak & Meyer, 1997; Denny-Smith et al., 2006: Ingledue et al., 2004; Montgomery, Bloch, Bhattacharya & Montgomery, 2010; Ho et al., 2005; Park, Chang & Chung, 2005). Similar results were documented for perceived severity, except for the results of two studies which stated that women agreed or understood that cervical cancer was serious, but the questions that measured seriousness were not about the participants' personal perception (Byrd et al., 2004; Guilfoyle et al., 2007). For example, one question stated, "cervical cancer is not as serious as other types of cancers" (Byrd et al., 2004).Further studies are needed to determine the reason for low susceptibility score in women infected with HIV. It is possible that HIV-infected feel that they are destined for death related to their HIV or are overwhelmed with their HIV diagnosis that are chronic diseases seem miniscule. Futures studies may consider determining the effects of fatalistic attitudes on Pap smear adherence and perceived susceptibility.

In the current study, women perceived that Pap smears were beneficial, (M = 15.93; range 4 - 20), and the majority of women did not believe they had barriers preventing them from getting a Pap smear (M = 29.16, range 14 – 56) (Table 4). The literature supports this finding (Byrd et al., 2004; Ho et al., 2005; Park, Chang & Chung, 2005). Note that perceived benefits and barriers were not measured using the same subscale, but variations of Champion's HBM.

Women in the study believed that they could request a Pap smear from their health provider(s) (M = 40.22, range 10-50). To date, no studies have used Champion's Self-efficacy scale to evaluate cervical cancer screening; therefore, the current literature cannot be linked to results of this study. Women receiving care from the Specialty Care Clinic may feel comfortable in requesting Pap smears and discussing intimate information because providers ask questions at each visit about risky behaviors including recent sexual encounters. It is essential for researchers to further study the relationship between perceived self-efficacy and Pap smear adherence.

Aim One

The purpose of this section was to evaluate the relationship between Pap test adherence in women infected with HIV and the following variables: CHBM, CSE, HPV/cervical cancer knowledge scale. There are two outcome variables: participant reported last Pap smear during the past year (yes or no) and medical chart documented last Pap smear during the past year (yes or no).

One would expect that women who received their Pap smear during the past year would have higher knowledge scores; and perceived susceptibility, seriousness, benefits, and self-efficacy scores; and lower perceived barriers scores. Most of the findings from the current study did not support that conclusion, but statistically significant differences were revealed for perceived barriers and self-efficacy.

Pap smear.

Knowledge. Differences in knowledge scores by last reported or documented Pap smear were not statistically significant. In the current study, women had knowledge deficits regarding HPV and cervical cancer. Future studies may want to consider creating

an intervention to increase HPV and cervical cancer knowledge using pre- and post-testing to evaluate the impact of the intervention on Pap smear adherence. In the current study knowledge was not directly related to Pap smear adherence, but knowledge was related to perceived barrier and self-efficacy, which were both related to Pap smear adherence.

Perceived seriousness and susceptibility. Women in the current study did not differ in their perceptions regarding the seriousness of cervical cancer and their personal susceptibility to cervical cancer based on their last reported or medical chart documented Pap smear. The findings are in agreement with previous studies (Allahverdipour & Emami, 2008; Boonpongmanee & Jittanoon, 2007; Burak & Meyer, 1997; Denny-Smith et al., 2006: Ingledue et al., 2004; Montgomery, Bloch, Bhattacharya & Montgomery, 2010; Ho et al., 2005; Park, Chang & Chung, 2005). It is possible that perceived seriousness to cervical cancer and HPV does not explain Pap smear adherence, but perceived susceptibility is a predictor of Pap smear adherence. Therefore, further research is needed.

Perceived benefits. Perceived benefit scores did not differ by last participant-reported or medical chart documented Pap smear (Tables 4 & 5). The findings of the current study do not agree with existing research. The current study is the first to evaluate HIV-infected which may account for the variations in the findings between the current study and existing studies. Further research regarding factors that influence cervical cancer screening should not focus on benefits of cervical cancer screening.

Aim Two

The purpose of this section was to evaluate the relationships between subscale variables (CHBM scale, CSE scale, HPV/cervical cancer knowledge) and selected demographic factors in HIV-infected women. To date, there is no published data evaluating differences in subscale variables by sociodemographic, risky behavior and clinical variables with regard to cervical cancer.

Sociodemographic.

Race. Caucasian women in the current study perceived themselves to be more susceptible to cervical cancer than Black women. The reason for the finding is unknown, but in this study susceptibility was correlated with barriers and seriousness. Further study is needed in African American women to determine their understanding of susceptibility and their personal risk for cervical cancer.

Education. In the current study, there are differences in knowledge, perceived benefits, barriers and self-efficacy by education (Table 10). As the level of education increased, knowledge increased, benefits scores increased, fewer barriers were perceived and self-efficacy scores increased. The finding is reasonable because knowledge is significantly correlated with self-efficacy, benefits and barrier. According to the current study, as knowledge increased benefits and self-efficacy increased and barriers decreased ($p < .001$). Future interventions should focus on increasing knowledge and perceived self-efficacy of women with a high school education or less.

Age. As women aged, their knowledge regarding HPV and cervical cancer decreased (Table 21); this is an expected finding. In the current study the average age was approximately 45 and the mean knowledge scores were low. It should be noted that the

first HPV prevention vaccine was approved in 2006 for females ages 9 - 26; therefore, older women are not the target of HPV prevention campaigns and may not be as knowledgeable as younger women (CDC, 2011). The same rationale can be used for older women feeling less susceptible to HPV and cervical cancer. Women over the age of 26 may not feel susceptible because the vaccine is not recommended for them. Further research is needed.

Risky behavior.

Cigarette use. Women who reported cigarette use felt more susceptible to cervical cancer. Although not statistically significant, they were more knowledgeable about cervical cancer and HPV, which is a reasonable finding. Providers are successfully conveying to patients that cigarette use increases their risk of cancer.

Condom use. There is an association between condom and the following subscale variables: perceived barriers and HPV knowledge. Perceived barriers and knowledge have a negative weak relationship, therefore, it would be expected that women who reported using condoms 75% of time would have lower perceived barrier scores than women who reported using condoms 100% of the time because the former had higher knowledge scores. Several women (165) reported always using condom which could be the results of social desirability responses, which increases the possibility of error.

Clinical variables.

HIV viral load. Women with low viremia were more confident in their ability to request a Pap smear than women with high viremia. Women with low viremia are taking antiretroviral medication to suppress HIV, which means that they are more likely to be adherent to scheduled appointments and have an establish rapport with their provider(s);

therefore increasing their confidence to request services. The relationship between self-efficacy regarding Pap smear adherence and HIV viral load was explored for the first time in the current study. However, existing studies have documented that women with lower viremia are more likely to adhere to Pap smears (Baranoski et al., 2011; Tello et al., 2010). Further study is needed to explain the relationship between HIV viral load and Pap smear adherence.

Subscale variables. Perceived susceptibility and seriousness were positively correlated, but the relationship was weak; so as susceptibility increases severity increases. This finding is supported by three studies conducted in women from various backgrounds and ages (Allahverdipour & Emami, 2008; Denny-Smith, Bairan & Page, 2006; Montgomery, Bloch, Bhattacharya & Montgomery, 2010). Despite the significant correlations between perceived susceptibility and seriousness, their relationship to Pap smear adherence was not significant, but perceived susceptibility was a significant predictor of Pap smear adherence. Therefore, researchers should not focus on perceived seriousness in future studies regarding Pap smear adherence.

There was a negative weak significant relationship between perceived barriers and benefits (Table 21). Women who perceived more benefits to cervical cancer screening perceived fewer barriers to cervical cancer screening. Existing studies support the finding (Allahverdipour & Emami, 2008; Lee, Fogg & Menon, 2008). Further studies should examine barriers that prevent women for adhering to Pap smears per ACOG guidelines via quantitative or qualitative research.

Aim Three

Aim 3 assessed the ability of the subscale (CHBM and CSE, and knowledge) and select demographic variables to predict Pap testing in women infected with HIV. Perceived susceptibility, barriers and last CD4+ T lymphocyte count predicted last Pap smear (Table 22). The variables did not predict medical chart documented Pap smear (Table 23).

In the current study, variables entered to the equation did not predict medical chart documented Pap smear (Table 23). Frequently providers request records from other facilities and upon receipt the records are lost, misplaced, or not enter into the electronic medical record system, which would result in women being incorrectly labeled as not having a Pap smear during the past year. A retrospective chart review study conducted at Johns Hopkins HIV clinic revealed that age, CD4+ T lymphocyte count and illicit substance use were predictors of Pap smear adherence (Tello et al., 2010). The study included approximately 1,100 participants receiving care from a clinic that provided gynecological and primary services in the same building which may improve documentation of last Pap smear. More HIV providers and clinics may want to consider offering multiple services in one building to increase adherence.

The current study revealed that perceived barriers and last CD4+ T lymphoctyte count are significant predictors of participant-reported last Pap smear when they are the only two variables retained in the equation. Existing research supports the currents study's finding that perceived barriers is a significant predictor of Pap testing (Boonpongmanee & Jittanoon, 2007; Allahverdipour & Emami, 2008; Lee, Fogg, & Menon, 2008; Ho et al., 2005). In addition, perceived susceptibility was a significant

predictor of participant-reported last Pap smear only in the presence of perceived barriers, age and knowing that a family history of cervical cancer is a risk factor for cervical cancer. There was a significant, weak relationship between perceived susceptibility and age, and perceived susceptibility and barriers which is a potential reason for perceived susceptibility being a significant predictor of participant-reported last Pap smear which is a potential reason for the findings.

Cronbach's Alpha

Cronbach's alpha was calculated for measures used in the study to evaluate the reliability of each subscale (Table 24). Overall the subscales had good internal consistency except perceived benefits. The perceived benefits subscale had acceptable internal consistency ($\alpha = .72$). A Cronbach's alpha of .72 is acceptable, but the goal for a seasoned scale is .80 or higher (Gliem & Gliem, 2003). Removing item 31 would increase Cronbach's alpha from .72 to .75. The perceived benefits scale for the current study was revised to reflect cervical cancer, rather than breast cancer. Victoria Champion created the scale in 1984 for breast self-examination (Champion, 1984). Gulten, Akyuz and Acikel (2010) adapted CHBM scales for cervical cancer and Pap smear testing, but instead of the perceived benefits scale consisting of four items the adapted scale consisted of seven. Four of the seven items measured benefits perceived and health motivations. It should be noted that health motivation is a separate concept developed by Victoria Champion (1984). For the current study only the four items that measure perceived benefits were retained. Cronbach's alpha is influenced by the number of items in the scale. It is possible that shortening the scale weakened it; therefore, utilization of the

subscale perceived benefits subscale for cervical cancer in the current study is novel and further research is needed to determine the reliability of the subscale.

Strengths

The current study is novel in that it evaluates Pap test adherence in HIV-infected women using the HBM more specifically the adapted CHBM and CSE scales. The current study utilized more variables from the HBM to assess Pap smear adherence than the existing body of literature. CHBM and CSE scales were adapted for use in cervical cancer by a researcher in Turkey, so the current study is the first in the U.S.A to utilize the adapted scale. The current study contributes to the current body of literature.

Limitations

The study has several limitations in its design and sampling; therefore, the generalizability of the findings may be limited. The study used a sample of convenience selected from two local ambulatory specialty care clinics, which may introduce selection bias. The participants were currently in care which excluded women who are potentially at greater risk due to lack of care. Future studies should include women not receiving regular care. The survey consisted of 76 items delivered via paper, which could lead participants to become fatigued and randomly select answers, which could increase error variance. Women may have selected answers that were socially desirable, which could result in bias. There are other clinics that serve HIV-infected women, but only women at the two research sites were eligible to participate.

Implications for Nursing

Practice. Health care providers should provide women with accurate and detailed information regarding HPV, cervical cancer, and Pap smears. This is particularly

important for women infected with HIV. Women should continue to be encouraged to obtain Pap smears per current guidelines. Barriers to Pap smear adherence should be addressed and eliminated or minimized when possible. Providers may want to consider completing Pap smears during a scheduled follow-up visit and not scheduling a separate gynecology appointment. Women had some knowledge deficits about HPV and cervical cancer; therefore educational material regarding HPV, cervical cancer and Pap smears should be available in various formats such as printed and audiovisual. Providers should complete educational activities to increase their awareness and knowledge. Having a better understanding can lead providers to be better advocates for Pap smears. Technology is a big part of healthcare so providers can search for a system that alerts them when patients' Pap smears are due.

Research. Participants in the current study had knowledge deficits regarding HPV and cervical cancer and a poor understanding of the Pap smear procedure. Knowledge deficits in patients could be a reflection of knowledge deficits in providers. Future studies should focus on assessing healthcare providers' knowledge of cervical cancer, HPV, and current ACOG guidelines. Existing research has linked inadequate health literacy to knowledge deficit (Gazmararian, Williams, Peel & Baker, 2003; William, Baker, Parker & Nurss, 1998). Understanding health information, including labs such as CD4+ T lymphocytes count and HIV viral load, may lead patients to make better health-related decisions. Therefore, Researchers should evaluate the effects of health literacy and numeracy on HPV/ cervical cancer knowledge in HIV-infected women.

In the current study, women with more confidence in their ability to request a Pap smear were more likely to have had a Pap smear within the past year, and perceived

susceptibility, barriers and last CD4+ T lymphocyte count were predictors of Pap smear adherence, and women lacked knowledge of HPV and cervical cancer. Due to high internal consistency of the perceived self-efficacy scale, the current instruments should be used in socially diverse population. Future interventions should focus in decreasing barriers, increasing adherence to antiretroviral medications to increase CD4+ T lymphocyte counts and increasing women's perceived risk of developing cervical cancer. Since women lacked knowledge, future studies could focus on how HIV-infected women receive health-related information. Qualitative research is vital in understanding factors that influence cervical cancer screening in HIV-infected women.

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Appendix A: Florida DOH IRB Approval Letter

May 14, 2012

To: Crystal Chapman-Lambert

Protocol Title: Predicting Factors that Influence Cervical Cancer Screening in HIV-infected Women: Using the Health Belief Model.
DOH IRB Number: H12014

Protocol Approval Date: May 14, 2012
Protocol Expiration Date: May 13, 2013

The Department of Health Institutional Review Board, or representative, determined your study involves no more than minimal risk and meets the criteria for expedited review. It has been granted **expedited approval**. The study is approved for implementation.

As a reminder, the IRB must review and approve all human subjects research protocols at intervals appropriate to the degree of risk, but not less than once per year. **You are responsible for completing a continuing review application for this project at least 60 days prior to the expiration date of : May 13, 2013. Action is required even if your study is closing.** Failure to complete an application for continuing review at least 60 days in advance of expiration is considered non-compliance by the Department of Health, and may result in closure of the study, reporting to institutional officials, and reporting to federal regulatory authorities, and suspension of funding, if funded by DOH.

Under federal regulations, if the IRB does not approve an application to continue research prior to expiration, then authorization to continue research expires automatically and all research must stop. Federal regulations do not allow any "grace" period or allow research to continue once authorization expires (except in limited circumstances).

Investigators are required to notify the IRB in writing as soon as possible, but within 5 working days, of the occurrence of any adverse events, unanticipated problems, injuries, side effects, deaths, other problems involving risks to subjects, or deviations from federal or state regulations, or DOH policy.

Appendix A (Continued)

The IRB has approved exactly what was submitted. Any revisions to this protocol or consent form, no matter how minor, must be presented to the IRB for review and approval before implementation of the changes, except where necessary to eliminate hazard to human subjects. If a change is required to eliminate an immediate hazard, the IRB should be notified as soon as possible but no later than 5 working days.

Research records must be maintained for three years after completion of the research; if the study involves medical treatment, it is recommended that records be maintained for eight years.

If you have questions, want to offer suggestions, or talk with someone about this or other projects, please contact the Department of Health IRB at (850) 245-4585 or toll-free in Florida (866) 433-2775. You may also visit our website at: http://flpublichealthethics.net/

Thank you for your cooperation with the IRB.

Sincerely,

Meghan Kennedy
Administrator, Institutional Review Board

Federal Wide Assurance#: 00004682

Appendix B: Informed Consent Document

Informed Consent to Participate in Research
Information to Consider Before Taking Part in this Research Study

IRB Study # _____

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher to discuss this consent form with you, please ask her to explain any words or information you do not clearly understand.

Please tell the research study investigator if you are taking part in another research study.

We are asking you to take part in a research study called: Predicting Factors that Influence Cervical Cancer Screening in HIV-Infected Women: Using the Health Belief Model

The person who is in charge of this research study is Crystal Chapman Lambert.

The research will be conducted at Bartow Specialty Care Clinic and Hillsborough County Specialty Care Clinic via a survey.

Appendix B (Continued)

Purpose of the study

- The purpose of this study is to learn more about HIV-infected women's knowledge and perception of cervical cancer and cervical cancer screening.
- As a women infected with HIV, you can provide information that can be used in the future development of programs to increase cervical cancer awareness and cervical cancer screening.
- A PhD student attending USF College of Nursing is conducting the study for the purpose of a dissertation.

Study Procedures

If you take part in this study, you will be asked to provide:

- Information about your medical history and sexual history, and complete a pencil and paper survey regarding your perceptions and knowledge about cervical cancer and cervical cancer screening.

This study can be completed during one sitting and is expected to take less than 60 minutes.
The study will be conducted at Bartow Specialty Care Clinic and Hillsborough County Specialty Care Clinic and the survey can be completed in a private area.

Total Number of Participants

It is expected that 300 women will volunteer in this study at Bartow Specialty Care Clinic and Hillsborough County Specialty Care Clinic.

Alternatives

You do not have to participate in this research study.

Benefits

We are unsure if you will receive any benefits by taking part in this research study.

Risks or Discomfort

This research is considered minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study.

Compensation

You will be given a $15 Walmart gift card after completing the survey.

Cost

There will be no additional costs to you as a result of being in this study. However, routine medical care for your condition (care you would have received whether or not you were in this study) will be charged to you or your insurance company.

Privacy and Confidentiality

We will keep your study records private and confidential. Certain people may need to see your study records. By law, anyone who looks at your records must keep them completely confidential. The only people who will be allowed to see these records are:

- The research team, including the Principal Investigator, study coordinator, research nurses, and all other research staff**.**
- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your records. This is done to make sure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety.
- Any agency of the federal, state, or local government that regulates this research. This includes the Food and Drug Administration (FDA), Florida Department of Health (FDOH), FDOH Institutional Review Board and the Department of Health and Human Services (DHHS) and the Office for Human Research Protection (OHRP).
- The USF Institutional Review Board (IRB) and its related staff, who have oversight responsibilities for this study, staff in the USF Office of Research and Innovation, USF Division of Research Integrity and Compliance, and other USF offices who oversee this research.

We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.

Voluntary Participation / Withdrawal

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study

New information about the study

During the course of this study, we may find more information that could be important to you. This includes information that, once learned, might cause you to change your mind about being in the study. We will notify you as soon as possible if such information becomes available.

You can get the answers to your questions, concerns, or complaints

If you have any questions, concerns or complaints about this study, or experience an adverse event or unanticipated problem, call Mrs. Crystal Chapman Lambert by email at cchapman@health.usf.edu.

Call Florida Department of Health Institutional Review Board (DOH IRB) at (866) 433-2775 (toll free in Florida) or 850-245-4585 If: 1) you have questions about your rights as a participant in this study, general questions, or have complaints, concerns or issues you want to discuss with someone outside the research or 2) If you have questions about your rights as a person taking part in this research study.

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I hereby certify that when this person signs this form, to the best of my knowledge, he/ she understands:

- What the study is about;
- What procedures/interventions/investigational drugs or devices will be used;
- What the potential benefits might be; and
- What the known risks might be.

I can confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in the appropriate language. Additionally, this subject reads well enough to understand this document or, if not, this person is able to hear and understand when the form is read to him or her. This subject does not have a medical/psychological problem that would compromise comprehension and therefore makes it hard to understand what is being explained and can, therefore, give legally effective informed consent. This subject is not under any type of anesthesia or analgesic that may cloud their judgment or make it hard to understand what is being explained and, therefore, can be considered competent to give informed consent.

_____

Signature of Person Obtaining Informed Consent / Research Authorization Date

_____

Printed Name of Person Obtaining Informed Consent / Research Authorization

Appendix C: Participant Questionnaire

1. Age (Please write a number. Do NOT write your date of birth) ___

2. Race/Ethnicity
   a. Black/African American
   b. White

3. Ethnicity
   a. African American (non-Hispanic)
   b. Caribbean (non-Hispanic)
   c. Hispanic/Latina
   d. Other
      Please indicate ethnicity of you would like. _____

4. Marital Status
   a. Single
   b. Significant other
c. Married
   d. Divorced
   e. Widowed

5. Primary Language
   a. English
   b. Creole
   c. Spanish
   d. Other

6. Educational Level:
   a. Less than a high school diploma
   b. High school/trade school
   c. College

7. Cigarette use
   a. Yes
   b. No
8. If yes:
   a. Currently
   b. Formerly

Appendix C (Continued)

9. Substance use (Cocaine, crystal-meth, or heroin)
    a. Yes
    b. No

10. If yes:
    c. Currently
    d. Formerly

11. How often do you use condoms?
    a. Never
    b. 25%
    c. 50%
    d. 75%
    e. 100%
    f. I don't want to answer

12. Number of sexual partner during past year?
    a. 0
    b. 1
    c. 2 or more
    d. I don't want to answer

13. Sexual experience:
    a. Currently sexually active (during the past 12 months)
    b. Not currently active
    c. Never had sexual intercourse

14. Have you ever had a Pap test?
    a. Yes
    b. No

15. If yes, when was your last Pap test?
    a. Within the past year
    b. Within the past 2 years
    c. Greater than 2 years

16. Have you ever been told that your Pap results were abnormal?
    a. Yes
    b. No
17. Do you feel like your doctor or nurse practitioner treats you differently because of your race or ethnicity?
    a. Yes
    b. No

Appendix C (Continued)

18. Do you feel like your doctor or nurse practitioner treats you differently because of your HIV/AIDS status?
    a. Yes
    b. No

For question 19- 57, please circle: Strongly disagree, Disagree, Neutral, Agree, or Strongly agree.

Susceptibility

19. It is likely that I will get cervical cancer in the future.
    Strongly disagree Disagree Neutral Agree Strongly agree.

20. There is a good possibility I will get cervical cancer in the next 10 years.
    Strongly disagree Disagree Neutral Agree Strongly agree.

21. I feel I will get cervical cancer in the future.
    Strongly disagree Disagree Neutral Agree Strongly agree.

22. I am more likely than the average woman to get cervical cancer.
    Strongly disagree Disagree Neutral Agree Strongly agree.

Seriousness

23. The thought of cervical cancer scares me
    Strongly disagree Disagree Neutral Agree Strongly agree.

24. When I think about cervical cancer, my heart beats faster
    Strongly disagree Disagree Neutral Agree Strongly agree.

25. I am afraid to think about cervical cancer
    Strongly disagree Disagree Neutral Agree Strongly agree.

26. Problems I would experience with cervical cancer would last a long time
    Strongly disagree Disagree Neutral Agree Strongly agree.

27. Cervical cancer would threaten a relationship with my boyfriend, husband, or partner.
    Strongly disagree Disagree Neutral Agree Strongly agree.

28. If I had cervical cancer my whole life would change
    Strongly disagree Disagree Neutral Agree Strongly agree.

29. If I developed cervical cancer, I would not live longer than 5 years
    Strongly disagree Disagree Neutral Agree Strongly agree.

Appendix C (Continued)

Benefits

30. Having regular Pap Smear Tests will help to find changes to the cervix, before they turn into cancer.
    Strongly disagree Disagree Neutral Agree Strongly agree.

31. If cervical cancer was found at a regular Pap Smear Test its treatment would not be so bad.
    Strongly disagree Disagree Neutral Agree Strongly agree.

32. I think that having a regular Pap Smear Test is the best way for cervical cancer to be diagnosed early.
    Strongly disagree Disagree Neutral Agree Strongly agree.

33. Having regular Pap Smear Tests will decrease my chances of dying from cervical cancer.
    Strongly disagree Disagree Neutral Agree Strongly agree.

Barriers

34. I am afraid to have a Pap Smear Test for fear of a bad result.
    Strongly disagree Disagree Neutral Agree Strongly agree.

35. I am afraid to have a Pap Smear Test because I don't know what will happen.
    Strongly disagree Disagree Neutral Agree Strongly agree.

36. I don't know where to go for a Pap Smear Test.
    Strongly disagree Disagree Neutral Agree Strongly agree.

37. I would be ashamed to lie on a gynecologic examination table and show my private parts to have a Pap Smear Test.
    Strongly disagree Disagree Neutral Agree Strongly agree.

38. Having a Pap Smear Test takes too much time.
    Strongly disagree Disagree Neutral Agree Strongly agree.

39. Having a Pap Smear Test is too painful.
    Strongly disagree Disagree Neutral Agree Strongly agree.

40. Health professionals doing Pap Smear Test are rude to women.
    Strongly disagree Disagree Neutral Agree Strongly agree.

41. I neglect or cannot remember to have a Pap Smear Test regularly.
    Strongly disagree Disagree Neutral Agree Strongly agree.

42. I have other problems more important than having a Pap Smear Test in my life.
    Strongly disagree Disagree Neutral Agree Strongly agree.

Appendix C (Continued)

43. I am too old to have a Pap Smear Test regularly.
    Strongly disagree Disagree Neutral Agree Strongly agree.

44. There is no health center close to my house to have a Pap Smear Test.
    Strongly disagree Disagree Neutral Agree Strongly agree.

45. If there is cervical cancer development in my destiny, having a Pap Smear Test cannot prevent it.
    Strongly disagree Disagree Neutral Agree Strongly agree.

46. I prefer a female doctor to conduct a Pap smear.
    Strongly disagree Disagree Neutral Agree Strongly agree.

47. I will never have a Pap smear if I have to pay for it.
    Strongly disagree Disagree Neutral Agree Strongly agree.

Perceived Self-efficacy

48. I can arrange transportation to get to my Pap smear appointment.
    Strongly disagree Disagree Neutral Agree Strongly agree.

49. I can arrange things in my life to have a Pap smear.
    Strongly disagree Disagree Neutral Agree Strongly agree.

50. I can talk to people at the clinic about my concerns.
    Strongly disagree Disagree Neutral Agree Strongly agree.

51. I can get a Pap smear even if I am worried.
    Strongly disagree Disagree Neutral Agree Strongly agree.

52. I can get a Pap smear even if I don't know what to expect.
    Strongly disagree Disagree Neutral Agree Strongly agree.

53. I can find a way to pay for my Pap smear.
    Strongly disagree Disagree Neutral Agree Strongly agree.

54. I can make an appointment for a Pap smear.
    Strongly disagree Disagree Neutral Agree Strongly agree.

55. I know for sure that I can get a Pap smear if I really want to.
    Strongly disagree Disagree Neutral Agree Strongly agree.

56. I know how to go about getting a Pap smear.
    Strongly disagree Disagree Neutral Agree Strongly agree.

Appendix C (Continued)

57. I can find a place to get a Pap smear.
    Strongly disagree Disagree Neutral Agree Strongly agree.

For questions 58- 63, please select the best answer.

Knowledge

58. The virus associated with cervical cancer is transmitted by:
    a. Sexual intercourse
    b. Blood transfusions
    c. Inanimate objects
    d. Talking
    e. I don't know

59. Cervical cancer and pre-cancer cells are associated with the presence of:
    a. Epstein-Barr virus
    b. Ebola virus
    c. Human papillomavirus
    d. Human immunodeficiency virus
    d. I don't know

60. Cervical dysplasia (abnormal cells) can be detected (found) by:
    a. X-rays
    b. Pap tests
    c. Blood tests
    d. Urine
    e. I don't know

61. Prevention of cervical cancer may require:
    a. Delayed onset of sexual activity
    b. Annual Pap test
    c. Use of condoms
    d. All of the above
    e. I don't know

62. Human papillomavirus (HPV) can cause:
    a. Vaginal discharge
    b. Genital warts
    c. Itching
    d. Burning urination
    e. I don't know

63. HPV can live in the skin without causing growths or changes:
    a. Yes
    b. No
    c. I don't know

For questions 64 – 72, please identify which of the following are risk factors of cervical cancer: (Answers: yes or no)

64. Multiple sex partners
    a. Yes
    b. No

65. Having genital warts/HPV
    a. Yes
    b. No

66. Sexual intercourse before age 18
    a. Yes
    b. No

67. Being immune suppressed
    a. Yes
    b. No

68. Having Chlamydia
    a. Yes
    b. No

69. Smoking cigarettes
    a. Yes
    b. No

70. Poor diet (low in fruits and vegetables)
    a. Yes
    b. No

71. Family history of cervical cancer
    a. Yes
    b. No

72. Use of oral contraceptives (birth control)
    a. Yes
    b. No

Appendix C (Continued)

73. Did your doctor or nurse practitioner at *this* clinic encourage you to get a Pap smear?
    a. Yes
    b. No

74. Did your doctor or nurse practitioner at a *different* clinic encourage you to get a Pap smear?
    a. Yes
    b. No

75. What or who encouraged you to get a Pap smear?
    Please list your reason(s):
    _____

76. What prevented you from getting a Pap smear?
    Please list your reason(s):
    _____

Appendix D: Chart Review

77. Year of HIV diagnosis _____

78. Year of AIDS diagnosis _____

79. Patient status
    a. New
    b. Existing (old)

80. CD4 count _____

81. Viral load
    a. Undetectable
    b. Not undetectable

82. History of a hysterectomy
    a. Yes
    b. No

83. Height _____

84. Weight _____

85. Last Pap smear history _____

86. History of abnormal Pap test?
    a. Yes
    b. No

87. History of depression?
    a. Yes
    b. No