Cervical cancer: Knowledge and behaviors of African American women, Clark County, Nevada

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ABSTRACT

Cervical Cancer: Knowledge and Behaviors of African American Women, Clark County, Nevada

By

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Numerous studies have revealed that African American women are at an increased risk for the development of cervical cancer. The purpose of this study was to assess the cervical cancer knowledge and disease prevention behaviors of African American women. This descriptive study utilized the Health Belief Model, which proposes that knowledge serves as a predictor of disease prevention behaviors. Fifty-two African American women were surveyed. Results revealed that 25.5% of respondents were cognizant of the fact that Pap smears screen for cervical cancer specifically. But, only 25.0% of study participants were able to identify HPV as the major cause of cervical cancer. As expected, 94.1% of participants undergo frequent Pap smears. However, 45.1% reported not using condoms. Odds ratio analyses revealed that women with accurate knowledge were more likely to participate in cervical cancer prevention behaviors. In addition, numerous misperceptions were identified, which point to the need for cervical cancer education and public health interventions within the African American community.
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CHAPTER 1

INTRODUCTION

Background and Significance

Cancer has become the second most common cause of death, in the United States; making cancer prevention a significant public health concern (ACS, 2005; CDC, 2007; NCI, 2007). Worldwide, approximately 300,000 women die from cervical cancer, annually (NCI, 2007). In 2007, an estimated 11,150 women will be diagnosed with cervical cancer and 3,670 will die from the disease, in the United States alone (NCI, 2007). Numerous studies have shown that African American (A.A.) women are at a higher risk for the development of cervical cancer (ACS, 2005; CDC, 2007; NCI, 2007). Nationwide, the incidence of cervical cancer is 12.2 per 100,000 African American (A.A.) women and 7.8 per 100,000 for Caucasian women (ACS, 2005). In the state of Nevada, cervical cancer incidence is 9.71 per 100,000 Caucasian women (Nevada State Health Division, 2006). Unfortunately, there are no cervical cancer statistics reported for African American women, specifically, in Nevada. Once diagnosed with cervical cancer, African American women are more likely to die from the disease than Caucasian women. The five year survival rate for cancer of the uterine cervix is 66% for A.A. women and 74% for Caucasian women (ACS, 2005). “The purpose of presenting cancer statistics for African Americans is to highlight areas where better treatment, early detection, and treatment can reduce their disproportionate burden of suffering and death from cancer.”
(ACS, 2005, p. 2). Understanding the factors that contribute to the higher morbidity and mortality rates in A.A. women is paramount to the development of important culturally specific interventions, in this population of women.

A major barrier to participation in cervical cancer screening is lack of knowledge. Lack of understanding surrounding the causes and risk factors of cervical cancer may add to misperceptions about personal susceptibility and threats to individual health. Women who do not perceive themselves as being at risk will likely not obtain regular Pap smears (CDC, 2007; Hislop, 2004). An important entry to lowering cervical cancer mortality and morbidity rates encompasses educating African American women about effective prevention measures. It is believed that accurate understanding and perceptions will facilitate improvement in screening rates and other preventative behaviors (Hislop, 2004). This, in turn, will aid in saving the lives of potentially thousands of women, each year.

Inadequate health prevention behaviors, such as infrequent participation in Pap smears may add to the disparity in cervical cancer rates among African American women (CDC, 2007; NCI, 2007; Neilson & Jones, 1998). Poor participation in pap smears have been related to poor outcomes (CDC, 2007; NCI, 2007, Neilson & Jones, ee1998). That is, women who have infrequent pap smears are more likely to be diagnosed with high grade lesions and malignancies (ACS, 2005; CDC, 2007). Statistics reveal that A.A. women present with more advanced lesions, compared to Caucasian women. This is believed to be related to their infrequent participation in cervical cancer screening programs (CDC, 2007; NCI, 2007).
Since cervical cancer is highly preventable, it makes no sense for women to die from this disease today. Cervical cancer is one of the few cancers in which the major cause is known. More importantly, it is preventable through early detection and treatment. Through participation in Pap smears and other preventative measures, the chances of a woman being diagnosed with cervical cancer can be dramatically decreased. Not only should women receive regular pap smears; but, they should also undergo HPV typing, and, if possible, receive the HPV vaccination (CDC, 2007; NCI, 2007). It should be noted that HPV typing and receiving the HPV vaccination do not take the place of pap smears. All three should be utilized together for optimum effectiveness. Women should also be cognizant of avoiding high risk behaviors. Cancer does not manifest as a result of one specific cause. It is the result of a combination of biological, cultural, behavioral, and socioeconomic factors. Thus, public health interventions must be multifaceted; addressing all contributing factors.

A great amount of research has been conducted in the area of cervical cancer. However, few studies have examined the determinants of cervical cancer in African American women. Specifically, the knowledge and perceptions of A.A. women have not been sufficiently analyzed. Moreover, for many years, there were no statistics available that outlined the incidence and prevalence of cervical cancer in the state of Nevada. Recently, cervical cancer statistics became available. However, the available statistics failed to provide a description of cervical cancer among African American women. This highlights the need for research in this area. This study is unique in that sense that it examines knowledge and behaviors of A.A. women, in the state of Nevada, surrounding cervical cancer causes, risk factors, and prevention.
This descriptive study will utilize the Health Belief Model (HBM) as its theoretical framework. The premise of the HBM is that the beliefs and attitudes of an individual are predictors of whether or not various health related behaviors will be exhibited (Janz & Stretcher, 2002; Juniper et. al, 2004; Rosenstock et. al., 1998). A comprehensive review of the use of the HBM in scientific research demonstrates that the premise of “perceived susceptibility” is the strongest contributor to understanding preventative health behaviors (Janz & Becker, 1984). That is, what a woman believes about her personal susceptibility to a disease (i.e. cervical cancer) will determine how she will act in terms of health screening (i.e. Pap smears).

In order to gain an understanding of the cervical cancer preventative health behaviors of African American women, we will sample women at or over the age of 18 years in Clark County, Nevada. These women will vary in age, income, and educational levels. Knowledge, perceptions and behaviors will be assessed through the use of a survey instrument. Churches are believed to contain a diverse group of members, in relation to level of education and income level (Fowler, 2006). Therefore, in order to obtain a diverse sample of A.A. women, participants will be sampled from a predominantly African American church, located in Las Vegas, Nevada. A.A. women will also be sampled from a local medical laboratory. Women sampled from the laboratory will include employees and clients of the facility.

In order to formulate effective public health programs, culturally specific determinants of health must be identified. This study aims to uncover the disparity in cervical cancer morbidity and mortality displayed by women within the African American community. The research also seeks to identify relationships between
knowledge and behaviors and various behavioral and social factors, such as: age, level of education, and income level, access to care, and insurance coverage.

Research Questions and Hypotheses

Research Question #1: What is the knowledge level and perceptions of A.A. women in relation to cervical cancer, in Clark County, Nevada?

- **Hypothesis 1a:** Less than 70% of women surveyed will know that the purpose of Pap smears is to screen for cervical cancer.
- **Hypothesis 1b:** Less than 50% of the women surveyed will be able to identify HPV as the major cause of cervical cancer or accurately state its mode of transmission.
- **Hypothesis 1c:** At least 50% of women surveyed will have false perceptions surrounding the cause of cervical cancer.
- **Hypothesis 1d:** Accurate knowledge of cervical cancer, Pap smears, and HPV will be equally distributed across level of education, income level, and age.

Research Question #2: What are the behaviors of African American women, in relation to cervical cancer prevention, in Clark County, Nevada?

- **Hypothesis 2a:** At least 90% of participants will report having frequent Pap smears.
- **Hypothesis 2b:** Approximately 50% of participants will report condom use.
- **Hypothesis 2c:** Cervical cancer prevention behaviors will be equally distributed across age, income level, and level of education.
Research Question #3: How is knowledge/perceptions related to participation in cervical cancer prevention behaviors, among African American women, in Clark County, Nevada?

- Hypothesis 3a: Women with false perceptions/inaccurate knowledge surrounding cervical cancer are less likely to participate in frequent Pap smears compared to those with accurate knowledge.

- Hypothesis 3b: Women with false perceptions/inaccurate knowledge surrounding cervical cancer are less likely to utilize condoms, compared to those with accurate knowledge.

Research Question #4: How are cervical cancer prevention behaviors affected by access to healthcare?

- Hypothesis 4a: Frequency of Pap smears is dependent upon type of medical coverage.

- Hypothesis 4b: Frequency of Pap smears is dependent upon type of healthcare facility utilized.
CHAPTER 2

LITERATURE REVIEW

Cervical Cancer

Although cervical cancer trends demonstrate a steady decline, hundreds of thousands of women die from the disease each year, in the United States, as well as around the world. Information obtained from the Surveillance Epidemiology and End Results (SEER) database reveals a 4.3% decrease in overall cervical cancer incidence (1997-2003), and a 3.7% decrease in A.A. women, specifically (1975-2003) (NIH, 2007). Nationwide cervical cancer mortality has decreased by 3.8% overall; with a decrease in A.A. women of 4.7%, during the period of 1975-2003 (NIH, 2007). Although overall cervical cancer rates are decreasing, many groups are still considered high risk for the disease, including, but not limited to minority racial/ethnic groups and individuals of lower socioeconomic status (CDC, 2007). As a result, thousands of women continue to die from cervical cancer each year (ACS, 2005; CDC, 2007).

Cancer begins at the cellular level. It occurs when the genetic material of cells has been altered, as a result of injury. This alteration to cellular material causes the cells to grow out of control; which is the trademark feature of cancer. The exact mechanism involved in injury to cervical cells is unknown. In cervical cancer, abnormal cells grow in the cervix; the lowermost portion of the uterus. It is a canal that connects the body of the uterus to the vaginal canal. Cancerous cells accumulate, forming tumors. These
malignant tumors can invade adjacent tissues or spread to distant sites in the body; altering normal bodily functions.

**Signs/Symptoms**

In the majority of cases, cervical cancer is asymptomatic. Thus, the absence of symptoms does not necessarily indicate the absence of disease. In some cases, women may experience the following: pain during sexual intercourse, pelvic pain, abnormal bleeding, lower abdominal pain, or an increase in vaginal discharge. (ACS, 2007; CDC, 2007; National Cancer Institute, 2007). Thus, women, quite often, are clueless to the presence of cervical lesions. This is why screening should be routine, as opposed to prompted by the presence of an abnormal symptom.

**Risk Factors**

Numerous risk factors associated with the development of cervical cancer. These risk factors include biological, behavioral and social determinants. The major biological risk factor implicated in cervical cancer is Human Papillomavirus (HPV) (CDC, 2007; NCI, 2007). Also, a rare form of cervical cancer has been linked to a medication given to pregnant women between 1940 and 1971; Diethylstilbestrol (DES). Behaviors contributed to the development of cervical cancer are: early onset of sexual activity, multiple sexual partners, sexual contact with a partner who has ha multiple sexual partners, multiple births, cigarette smoking, and poor participation in cervical cancer screening programs (ACS, 2005; CDC, 2007; NCI, 2007). Social determinants of cervical cancer, include, but aren’t limited to: lack of/inadequate knowledge, low income.
status, inadequate access to care, and inadequate healthcare coverage (ACS, 2005; CDC, 2007; Hewitt et. al., 2002; NCI, 2007).

*Human Papillomavirus and Cervical Cancer*

HPV is a non-encapsulated, double-stranded DNA virus. It has been identified as the primary culprit in the development of cervical cancer (ACS, 2005; CDC, 2007; NIH, 2007). Infection with a high risk strain of HPV places the woman at an elevated risk of developing cervical cancer. Although most HPV infections are fought off by the body’s natural defense mechanisms, in about 5% of the cases, the virus persists (CDC, 2007; NCI, 2007). These persistent infections can lead to changes in the cells of the cervix which progress to cancer, if left untreated.

HPV is an extremely common group of viruses which infects approximately 75% of all adults at some point in their lives (Seppa, 2006). There are over one hundred Human Papillomaviruses; 30 of which are passed through sexual contact (CDC, 2007; NCI, 2007; Winer et al., 2006). HPV is classified as low-risk, when the virus is not usually associated with cancer. Genital HPV viruses which are considered low risk include HPV types: 6, 11, 40, 42, 54, 55, 57, 61, 62, 64, 69, 70, 71, 72, 81, 83, and 84 (Winer et. al, 2006). These types are responsible for genital warts; referred to as condylomata acuminatum. Strains associated with cancer are classified as “high-risk”. There are numerous strains associated with genital malignancies. These include, but aren’t limited to: 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, and 69. Over 70% of cervical cancers are attributed to types 16 and 18 (Winer et. al, 2006).
HPV Transmission & Condoms

HPV is a sexually transmitted infection. Because of this, researchers have sought to understand the effectiveness of preventing its spread through the use of condoms. One interesting point to make about HPV is that, unlike other sexually transmitted diseases, condoms provide limited protection. This may be associated with the fact that condoms do not always cover all infected epithelial tissue (Christopher, A., 2004). According to the National Cancer Institute, the HPV virus can be transmitted regardless of whether or not latex condoms are worn (2007). However, the National Cancer Institute also notes that lower cervical cancer rates are associated with condom use (2007). Therefore, condom use has been shown to provide some protection against the spread of HPV. However, studies on the effectiveness of condoms against the spread of infection are greatly lacking. Many of the existing studies utilized retrospective designs. It is believed that only studies utilizing prospective designs can accurately address the effectiveness of condom use in HPV prevention (Holmes et. al, 2004). Currently, there is no consensus on the effectiveness of condom use in preventing the spread of HPV. In a 2000 study, directed by the National Institutes of Health, a review of existing studies on the effectiveness of condoms in the prevention of sexually transmitted infections revealed that existing research was insufficient. In this analysis, no correlation was demonstrated between condoms and HPV (Holmes et. al., 2004). However, recent studies demonstrate that the use of condoms significantly reduces the risk of HPV infection (Winer et. al., 2003, Winer et. al., 2006). In a study involving condom use of 82 college age women, results revealed that women who utilized condoms 100% of the time were less likely to become infected with HPV (37.8 per 100 patient-years at risk), as compared to women
whose partners used condoms less than 5% of the time (89.3 per 100 patient-years at risk) (Winer et. al., 2006). In the same study, the researchers discovered the presence of a dose-response relationship between frequency of condom use and subsequent HPV infections (Winer et. al, 2006). As frequency of condom use increased, frequency of HPV infection decreased. In a previous study by Winer et. al, it was discovered that sex with a new partner was associated with a higher incidence of HPV infection, in a sample of 603 female university students (Winer et. al., 2003). This also supported the possibility the HPV can be transmitted through non-penetrative sexual contact, in reported virgins. A recent study revealed that condom use decreases the regression times of HPV related penile and vaginal lesions (Holmes, 2004). Other research has demonstrated that condom use reduces the risk for HPV infections and cervical lesions by up to 70% (Winer, et. al, 2006; Winer et. al, 2003). The advocacy of condom use in the prevention of HPV is currently a hot debate among public health officials, doctors and health educators.

Thirteen high risk strains of HPV can be identified through Polymerase Chain Reaction (PCR) analysis. It is recommended that samples be analyzed for HPV in cases of inconclusive Pap smear results (NCI, 2007). This test is important because it can detect the presence of HPV, even in the absence of cervical lesions (NCI, HPV Q&A). In general, identification of HPV can be a useful screening tool. The presence of high risk strains may enable the clinician to better plan patient care.

Recently, a HPV vaccine was approved by the FDA. The vaccine was developed by Merck Pharmaceutical Co. and is called Gardasil® (Markowitz et. al., 2007). The vaccine is approved for females between the ages of nine and twenty-six. Currently,
clinical trials are being conducted to assess the effectiveness in men. Gardasil®
vaccinates against HPV 6, 11, 16, and 18. It has been shown to provide protection
against genital warts (HPV types 6 and 11) and up to 70 percent of cervical cancers (HPV
types 16 and 18). Thus, there are a great proportion of cervical cancers for which no
vaccination is available. This is why it is important for women to continue to receive
regularly scheduled Pap smears; even after vaccination. Currently, there is a great
amount of debate surrounding how this vaccine will be implemented. Since the vaccine
works only before infection occurs; it is desired to vaccinate females before they become
sexually active. Since, almost one quarter of girls begin having sex before the age of 15,
it is recommended that the first injection, of a series of three injections, be administered
between the ages of 11 and 12 years (Markowitz, 2007). Advocates of the HPV vaccine
suggest that Gardasil® should be required, as a part of childhood immunizations (CDC,
2007). Whether required or not; Gardasil® will have a tremendous impact on the future
of cervical cancer. This vaccine can, potentially, prevent cervical cancer; saving an
enormous number of lives.

Cervical Cancer Diagnosis

Abnormal changes of the cervix are diagnosed primarily through the use of Pap
smears. The purpose of pap smears is to catch changes in before they progress to cancer.
According to the National Cancer Institute, cervical cancer incidence has decreased by
74%, since the implementation of Pap smears in the 1950s (2007). This statistic
demonstrates the effectiveness and importance of Pap smears, in cervical cancer
prevention. The Pap smear procedure includes cells being sampled from the uterine
cervix. Samples are taken utilizing cervical brushes, cervical brooms, spatulas, and other devices. There are various types of smears made, including conventional techniques and liquid based techniques. Liquid based techniques are preferred because they provide for better cell preservation. Also, the processing methods provide for higher detection rates of abnormalities. Studies show that 65% more high grade lesions are detected on liquid based methods, as compared to conventional methods (Cytyc, 2007). In the conventional method, at the time the sample is taken, the cells are immediately fixed to a glass slide and sent to a medical laboratory for processing and microscopic evaluation. In liquid based methods, such as ThinPrep® and SurePath®, samples are not immediately fixed to slides. Instead, at the time the sample is taken, the cellular material is dispersed into a liquid preservative before it is sent for screening. Once the liquid based sample is received by the medical laboratory, it undergoes processing; which includes transferring the cellular sample to a slide through specialized equipment and techniques, staining, and cover slipping. Once prepared, the sample is examined microscopically by a cytotechnologist and/or a pathologist. Although the purpose of Pap smears is to detect pre-malignant and malignant lesions; microscopic evaluation can also detect infectious/inflammatory processes, various microorganisms, and reparative processes. Since the implementation of pap smears, the incidence of cervical greatly has greatly declined. A study, based on the National Survey of Family Growth, reported that 69% of reproductive-age women reported having had a Pap smear within the previous year (Hewitt, et. al., 204). In 2002, 91.2% of A.A. women and 89.2% of Caucasian women reported having had a pap smear within the preceding three years. As mentioned above, low participation in Pap smears is considered a risk factor for the development of cervical
cancer. Data obtained from the Behavioral Risk Factor Surveillance System (BRFSS) reveals the following Pap smear screening rates: 84.8% (Nevada), 85.4% (Clark County), and 85.4% (Las Vegas) (CDC, 1997). These statistics include women of all races. These rates were similar to those reported for California (84.8%), Arizona (85.2%) (CDC, 2007). The Pap smear screening rate was slightly lower in Utah, with a reported 78.2% (CDC, 2007). The corresponding median rate of Pap smear screening was reported at 85.9% (CDC, 2007).

Once abnormalities have been identified through microscopic evaluation, further evaluation may be indicated. A common diagnostic tool is colposcopy; in which the cervix is looked at through a colposcope. The colposcope is a magnifying instrument; which helps the clinician to better view abnormal areas of the cervical. When abnormal areas are viewed, samples of tissue or biopsies can be taken. A portion of tissue which has been removed for further evaluation is referred to as a biopsy. There are various forms of biopsies, including: punch, cone (conization), LEEP, and endocervical curettage. Samples of cervical tissues are pinched off via the use of a punching device in a punch biopsy. In a LEEP biopsy, a portion of the cervix is sliced off with the aid of a looped wire device. Samples of the cervix are either brushed or scooped off utilizing endocervical curettage. A cone biopsy entails removing a piece of cervical tissue for diagnostic and treatment purposes. The resulting biopsy is shaped like a cone. (NCI, 2007).
Treatment

Treatment depends upon the specific diagnosis; low grade, high grade, or malignant. Low grade lesions may be treated with cryosurgery or excision. Cryosurgery entails the lesion being viewed through the use of a colposcope and subsequently frozen via the aid of nitrogen gas. The frozen cells die and slough off from the cervix. The abnormal cells may be excised from cervix through the use of a LEEP or cone biopsy procedure. Laser surgery may also be utilized to remove abnormal tissue. High grade lesions are usually treated in the same manner as low grade lesions. However, in some cases, the patient and her physician may decide to remove a portion or the entire uterus; a procedure referred to as a hysterectomy.

Malignancies are treated with surgery (hysterectomy), radiation therapy, chemotherapy, or some combination of these. This is dependent upon the staging of the cancer. When the cancer remains localized, treatment could entail the use of a cone, laser or LEEP biopsy. Cryosurgery may also be utilized in this situation. However, if the cancer is more invasive; then, a hysterectomy is indicated. A total hysterectomy involves removing both the cervix and the body of the uterus. In some of the more advanced cases, a radical hysterectomy may be indicated; which involves the removal of the body of the uterus, the cervix, and a portion of the vagina. A salpingo-oophorectomy, or removal of the fallopian tubes and ovaries, may accompany a hysterectomy. When cancer has spread to adjacent lymph nodes, they may be removed as well.

Radiation therapy may be utilized to kill cancer cells. Radiation kills cells through the use of high-energy rays. External or internal techniques may be utilized. Internal radiation (intracavitary radiation) involves the implantation of radioactive tubes
into the vagina. Tubes are left in place from varying amounts of time; ranging from hours to days. External radiation involves directing radiation waves, from a machine, to specific areas of the woman's body. Radiation may be done alone or in addition to chemotherapy or hysterectomy. Chemotherapy involves the use of pharmacological agents to destroy malignant cells.

**Prognosis**

African American women have a higher cervical cancer mortality rate than Caucasian women. Prognosis is greatly upon the stage at diagnosis. According to the American Cancer Society (ACS), when lesions are localized, the five year survival rate is 93% for Caucasian women and 87% for A.A. women. As the lesion advances to regional classification, the survival rates fall to 53% (Caucasian women) and 50% (A.A. women). The probability that a woman will survive for five years or more is bleak when considering distant lesions; 18% for Caucasian women and 11% for A.A. women. Thus, it is important to identify lesions before they advance. (ACS, 2005).

**Screening Recommendations**

According to the National Cancer Institute, cervical cancer screening should begin three years after the onset of sexual intercourse, no later than age 21. Thereafter, women should undergo Pap smears once every three years. Screening is not necessary in women over the age of 65, who have had three normal pap results within the preceding 10 years. Women who have had a hysterectomy, due to benign causes, may also decide to stop cervical cancer screening. If a women has had a hysterectomy due to an abnormal
pap smear; then, she should continue regular pap screening. (National Cancer Institute, 2007).

Pap smear Results

It is important for women to understand Pap smear results. This is due to the fact that follow-up and treatment may vary with individual results. Following is a description of Pap smear results:

- **Within normal limits (WNL):** This is a normal result. It means that no abnormalities were noted in the nucleus or cytoplasm of the cells.

- **Atypical cells of undetermined significance (ASCUS):** This is not a cancerous lesion. The changes in the nucleus and/or cytoplasm of the cells are suggestive of a low grade lesion; mild dysplasia or HPV infection. However, not all of the necessary criteria are met for classification as a low grade lesion. Bethesda guidelines suggest that all ASCUS results be followed up with HPV typing to determine the presence of high risk HPV strains (CDC, 2007; Markowitz, 2007).

- **Atypical cells of undetermined significance-High grade (ASCUS-H):** This is not a cancerous lesion. Abnormal changes are suggestive of a high grade lesion. However, not all of the necessary criteria are met for a high grade lesion.

- **Atypical glandular cells of undetermined significance (AGUS/AGCUS):** This is not a cancerous lesion. However, abnormal changes are present in the glandular (columnar) cells of the cervix. These glandular cells are responsible
for the production of mucus. Changes represented by AGUS only partially meet the requirements of more advanced glandular lesions.

- **Low grade squamous intraepithelial lesion (LSIL):** This is not a cancerous lesion. However, changes in the nucleus and cytoplasm of the cells are consistent with HPV infection/mild dysplasia. Most of these lesions are self-limiting; regressing in usually less than six months. When considering the thickness/depth of cervical tissue, low grade lesions penetrate the upper 1/3 of the tissue; affecting superficial cells/tissue only. Thus, these lesions usually do not progress to cancer. However, it should be noted that low grade lesions may progress to high grade lesions, if left untreated. More importantly, high grade lesions have an inherent risk of progression to carcinoma. Treatment of low-grade lesions is more responsive than high grade lesion. Thus, it is important to catch lesions in this stage, before they progress.

- **High grade squamous intraepithelial lesion (HSIL):** This is not cancer. However, a great percentage of these lesions progress to cancer, if left untreated. Abnormal changes in the cytoplasm and nucleus of the cells are more pronounced as compared to low grade lesions. High grade lesions include moderate and severe dysplasia. In this lesion, abnormalities penetrate through the lower 2/3 of the cervical tissue; affecting more immature cells. **Carcinoma in-situ (CIS)** is included in the high-grade category. CIS represents a precursor to invasive cancer; a lesion that has not penetrated through the basement membrane of the cervical epithelium. A high grade is
serious and should not be ignored. It puts the woman at a very high risk of developing cervical cancer.

- **Squamous Cell Carcinoma:** This is cancer of the cervix, involving cells of squamous epithelium. It represents over 70% of all cervical cancers (NCI, 2007). In this case, the abnormal tissue has penetrated the basement membrane of the cervical epithelium; invading underlying or surrounding tissue. It should be noted that, in many cases, a diagnosis of “suspicious for squamous cell carcinoma” is rendered. This occurs when a positive cytological diagnosis of straight out cancer is not possible; due to missing cytological features. Please see below for grading of cervical cancer. Histological correlation is necessary for a definitive diagnosis.

- **Adenocarcinoma in situ (AIS):** In this case, cytological changes are consistent with serious abnormalities in the glandular cells of the cervix. AIS is the precursor to adenocarcinoma (see below). It is a severe lesion which has not yet invaded the basement membrane of the cervical epithelium. If left untreated, it will likely progress to cancer.

- **Adenocarcinoma:** This is cancer of the cervix, involving glandular epithelium. As with squamous, abnormal tissues have invaded surrounding tissues. Adenocarcinoma occurs in up to 20% of the cases of cervical cancer (NCI, 2007). “Suspicious for adenocarcinoma” may be rendered in cases where a definitive cytological diagnosis is not possible. Histological correlation is necessary for a definitive diagnosis.

(CDC, 2007; DeMay, 1996 NCI 2007)
Health Belief Model

It is no secret that many public health programs and services are greatly underused. In 1950s, participation in programs, such as free screening for tuberculosis, was extremely low (Communication Initiative, 2003; University of Twente, 2004). This prompted the United States Public Health Service to identify the factors that contributed to this low participation. As a result, the Health Belief Model was formulated. The premise of the HBM is that the beliefs and attitudes of an individual are predictors of whether or not various health related behaviors will be exhibited (Janz & Stretcher, 2002; Juniper et al., 2004; Rosenstock et al., 1998). The constructs of the HBM encompasses perceptions of susceptibility to disease/illness, perceived severity of disease/illness, attitudes surrounding benefits of prevention behaviors, and barriers to prevention behaviors. Behavior is further influenced by “cues to action” and self efficacy. Descriptions of the constructs of this model are as follows:

- **Perceived susceptibility**: Prevention behaviors are influenced by whether or not the individual perceives himself/herself as susceptible to the illness. For example, if an individual believes that there is a low risk of getting a disease, this may be translated into a lack of preventative behaviors, such as no or low condom use or lack of routine gynecological examinations (Burak & Meyer, 1997).

- **Perceived severity**: How the individual views the consequences of getting the disease, if left untreated, influences prevention behaviors. It is important to educate individuals about the consequences of a condition. This will enable them
to make better decisions (The Communication Initiative, 2003; University of Twente, 2004).

- **Perceived barriers/benefits:** Individuals compare the costs (physical, financial, psychological, and social) against the benefits of a particular action. Individuals may be influenced to adopt a behavior or discouraged from the behavior, depending on how these are factors assessed. It is important that an individual has faith in the fact that recommended actions will reduce or eradicate the impact of the condition. It is important to provide information about the expected outcomes of an advised action. For example, Pap smears are important because they may catch lesions before they advance to a more serious stage.

- **Perceived efficacy:** This can be viewed as the individual’s belief in his/own power or ability to make a change. Self-efficacy is related to self-esteem or a positive self image. The individual must have inner courage and faith in what he/she can accomplish, in order to proceed with an action.

- **Cues to action:** What triggers an individual to take a recommended health action? Cues to action are identified as things that motivate or trigger an individual to take an active role in their own health. These are the things that motivate individuals to take the preventative, screening, or therapeutic actions that encourage better health.

(Burak & Meyer, 2005; Rosenstock, et. al, 1994; University of Twente, 2004).

The HBM has been utilized in many public health studies to gain an understanding of health behaviors (Burak & Meyer, 1997; CDC, 2007; Ingledue et. al., 2004). For example, what a person believes about HIV/AIDS transmission can predict
whether or not he/she utilizes condoms or exhibits other risky sexual behaviors (Burak & Meyer, 1997; University of Twente, 2004). Health behaviors surrounding diabetes self-care, condom use, breast self-examination and needle stick practices have been explored in relation to the HBM (Burak & Meyer, 1997). In an article by Ingledue Et. al., the HBM was utilized to examine college women’s knowledge, perceptions, and preventative behaviors regarding Human Papillomavirus infection and cervical cancer (2004). In an examination of 428 college women, ages 18-30, results revealed that high risk sexual behaviors are associated with inadequate levels of knowledge, perceived susceptibility, and perceived seriousness in relation to cervical cancer. The theoretical framework of the HBM was utilized to show the effectiveness of community-based interventions, which take into account religious and cultural beliefs, among Black Minority ethnic groups of the United Kingdom (Thomas, et. al., 2004).

High Risk Groups

Women's whose income falls 150% below the national poverty level are less likely to participate in cervical cancer screening than women whose income fall 300% above the national poverty level (Hewitt et. al., 2004). Income has been shown to be greatly correlated with participation in cervical cancer screening (McFarland, 1998). This is very likely associated with the fact that a large percentage of low income women lack a high school education (U.S. Census Bureau, 2007), have low levels of knowledge surrounding healthcare issues (Radecki, 2005), lack health insurance (U.S. Census Bureau, 2007), and have limited access to health care (Datta, 2006; U.S. Census Bureau, 2007). In a 2005 study, it was demonstrated that low income women had inadequate
knowledge surrounding Pap tests (Radecki, 2005). In this study, women were asked about their knowledge pertaining to the purpose of Pap tests and the symptoms of cervical cancer. The study also sought to ascertain whether women understood the abnormal Pap results and how to follow-up on them. Women who earned at least $10,000/yr had low knowledge, answering only 9.3/20 questions correctly. Knowledge was even lower in women who earned less than $10,000/yr (8.4/20). Low income women with more than an high school education had more knowledge regarding Pap tests than women with less than a high school education; answering 10.7/20 and 7.9/20 questions correctly, respectively (Radecki, 2005). In addition, results of a recent study investigating the cervical cancer knowledge of low income women in Clark County, Nevada revealed that a mere 60% of women knew the purpose of Pap smears (Kapella, 2007). Moreover, only 20% were aware of the relationship between HPV and cervical cancer. Over one-third of low-income women surveyed were aware that HPV was transmitted through unprotected sexual intercourse (Kapella, 2007).

Research has demonstrated that level of education is associated with Pap smear screening rates. Women who did not graduate high school have lower Pap smear rates than women with college degrees (Hewitt et. al., 2004). Healthcare coverage has also been shown to affect Pap smear participation. Uninsured women are more likely to not participate in cervical cancer screening (Hewitt et. al., 2004). When comparing women with Medicaid coverage to private insurance, it was discovered that Pap smear participation rates were similar (Hewitt et. al, 2004).

Statistics from the National Survey of Family Growth reveal that the most common places to receive Pap smears are at health maintenance organizations and private
doctor's offices (78.9%) (Hewitt et. al, 2004). The majority of women with at least one identified cervical cancer risk factor receive gynecological exams at a publicly funded clinic, as compared to a HMO or private doctor's office (Hewitt et. al., 2004). Screening at public clinics (i.e. family planning) and other healthcare sites (i.e. schools, hospitals, etc.) are significantly lower; with rates at 10.2% and 2.8%, respectively (Hewitt et. al., 2004).

"Many women undergoing cervical cancer screening lack appropriate understanding of the Pap test" (Radecki, 2005, p. 78). Inadequate knowledge surrounding cervical cancer, associated risk factors, and Pap tests are strongly associated with low participation in Pap tests and increases in cervical cancer rates. Low levels of knowledge transcend geographic, socioeconomic, or racial/ethnic boundaries. Women all over the world are being diagnosed with and dying from cervical cancer. Studies have shown that women of the U.S. are not alone in their lack of cervical cancer knowledge. In Scotland, studies revealed that over 90% of the women diagnosed with cervical cancer had never had a Pap smear (Neilson & Jones, 1998). In a study of women, living in Lothian, Scotland, results upheld the fact that there exists a general lack of knowledge surrounding the Pap test as well as the causes of cervical cancer (Neilson & Jones, 1998). In the same study, it was discovered that fear and dislike of the Pap test also contributed to low participation. Cervical cancer is the most common type of cancer in Botswana (McFarland, 2003). A study of 30 women, residing in Botswana, revealed a correlation between income status and cervical cancer knowledge. Almost fifty percent of women, residing in Botswana, had limited or no knowledge about cervical cancer (McFarland, 1998). Knowledge surrounding the causes of cervical cancer was extremely low, with a
mere 3% of study participants displaying a good level of knowledge (McFarland, 1998). 20% percent of participants displayed fair knowledge surrounding the causes of cervical cancer; with 43% (limited knowledge) and 33% (no knowledge) (McFarland, 1998). Almost half of the women surveyed had limited or no knowledge of the Pap test. In Canada, a survey of over five hundred immigrant Chinese women demonstrated low levels of knowledge about cervical cancer and its risk factors (Hislop, 2004). This study also revealed a strong relationship between cervical cancer knowledge and level of education. The gender of the physician was also shown associated with cervical cancer knowledge. Women with higher levels of knowledge were more likely to participate in Pap screening tests (Hislop, 2004). Knowledge of the pathophysiology of cervical cancer and Pap tests were shown to influence cervical cancer rates in Hispanic women, in the U.S. (Allison & Pena-Purcell, 2005). Through the use of the HBM, this study of Hispanic women demonstrated that cervical cancer rates have strong ties to acculturation, cultural beliefs, and lack of access to healthcare (Allison & Pena-Purcell, 2005). It is important to evaluate knowledge and informational needs about Pap-testing among groups who may have difficulty assessing care or relatively low likelihood of obtaining follow-up for an abnormal result, such as minority or low income women” (Radecki, 2005). In a study of 338 low income women, residing in Texas, knowledge surrounding Pap tests was assessed (Radecki, 2005). It was discovered that knowledge of Pap tests was limited; with women correctly answering approximately half of the questions (Radecki, 2005). In this study, knowledge was also influenced by race. White women correctly answered 10.2 of 20 questions related to Pap tests. African American women
correctly answered 8.4/20 questions. Knowledge was lowest among Hispanic women; who answered an average of 7.4/20 questions.

African Americans are disproportionately represented in most major diseases. This is due to the fact that a great majority of African Americans have educational levels, low income levels, inadequate access to health care and inadequate healthcare coverage. Impoverished African American women, who reside in poor neighborhoods, are associated with poor participation in cervical cancer screening (Datta, 2006). “The general trend is that minority persons and those with lower incomes have lower rates of screening” (Barton, 2006, p. 615). Thus, it is important to target these groups for public health intervention, if a decrease is going to be discovered in relation to disease morbidity and mortality rates.

Healthy People 2010

The Healthy People 2010 document outlines the nationwide agenda for improving the health of the nation. The premise of this document is to help individuals achieve longer and healthier lives (CDC, 2007). A major goal of Healthy People 2010 is to eliminate health disparities. Achieving the goals outlined in the document is a far reaching and collaborative effort, on the parts of various public health agencies, in both public and private sectors. Preventable threats to health were identified, as a result of numerous studies and statistical data. These threats to health were utilized to outline the nation’s plan to improve morbidity and mortality, in relation to various diseases/illnesses. Twenty-eight focus areas are identified, in the Health People 2010 document. The document also identifies leading “indicators” of health. The health indicators will serve
as tools which will be utilized to measure progress. The ten leading health indicators include: tobacco use, overweight/obesity, physical activity, substance abuse, responsible sexual behavior, injury/violence, mental health, immunization, access to health care and environmental quality. It should be noted that these health indicators are strongly reliant upon: the health information available to individuals, personal choices/behaviors, environmental factors, socioeconomic factors, and access to care issues. Four hundred and sixty-seven health objectives are identified in the document. (CDC, 2007).

The reduction of cancer related morbidity and mortality is a major goal (Goal-3) of Healthy People 2010 (CDC, 2007). A major health disparity exists in the area of cancer. African Americans have higher mortality rates than any other race, including Whites, Hispanics, Asians, Pacific Islanders, and American Indians. Goal 3-4 is to reduce the number of deaths due to cervical cancer. Rates from 1998 serve as a baseline for comparison. In 1998, the nationwide mortality rate from cervical cancer was 3.0 per 100,000 (CDC, 2007). The goal set for the nation is 2.0 per 100,000. In 1998, a racial breakdown of cervical cancer deaths revealed: African American women (6.0/100,000), White women (2.7/100,000), Hispanic women (3.3/100,000), American Indian/Alaska Native women (2.5/100,000), and Asian/Pacific Islander women (3.3/100,000). A further analysis, by level of education, revealed that women with less than a college education were likely to die from cervical cancer (7.2/100,000), compared to those with at least a high school education (4.8/100,000) and those with some college (2.1/100,000) (cite). Goal 3-11 is to increase Pap smear screening rates. This goal is divided into two categories; including women 18 years and older who have ever had a Pap smear (Goal 3-11a), and women 18 years and older who have had a Pap smear within the preceding
three years (Goal 3-11b). In 1998, 92% of the women 18 and over who had ever had a Pap smear. The rate to be achieved by 2010 is 97%. Increasing the number of women, who had a Pap smear in the preceding three years, from 79% (1998) to 90% (2010), is a major aim of this initiative. Surprisingly, 1998 data revealed that African American women have achieved screening rates similar to those of White women. Those who had ever had a Pap test was 94% for A.A. women and 93% for White women. The more important indicator of cervical health is very likely revealed in the frequency of Pap test. Unfortunately, women need great improvement in frequency. The number of women who underwent Pap testing in the preceding year was 83% among A.A. and 79% among Whites. Again, disparities are revealed in relation to level of education: less than high school (89% ever had pap, 69% pap within last three years), at least some high school (95% ever had pap, 78% pap within last three years), and some college education (97% ever had pap, 83% pap within last three years). (CDC, 2007).

Cervical Cancer in Nevada

In 2003, the cervical cancer incidence was 9.65 per 100,000 women, in Nevada (Nevada State Health Division, 2006). Although the Nevada State Interactive Health Database System describes the incidence for Caucasian women (9.71 per 100,000) and Hispanic women (8.79 per 100,000), no data was available in reference to African American, Native American, or Asian women. Data obtain from the Behavioral Risk Factor Survey Surveillance System (BRFSS) reveal that fewer women in Nevada have health care access/coverage compared to the nation (CDC, 2007). In response to the question, “Do you have any kind of health care coverage?”, 21.7% of Nevadan women
answered “No”, as compared to 14.5% nationwide (CDC, 2007). Nevadan women have similar Pap tests screening rates, as compared to the nationwide average (CDC, 2007). BRFSS data (2004) demonstrated that 15.4% of women in Nevada had not participated in cervical cancer screening in the preceding three years, as compared to 14.0% of U.S. women (CDC, 2007). Unfortunately, no studies or data were located that demonstrate the incidence, prevalence, and mortality among African American women, in Nevada.
CHAPTER 3

METHODOLOGY

Study Design

This is a descriptive study, which utilized a quantitative research design. A survey instrument was utilized. The survey contained questions which sought to ascertain the knowledge, perceptions, and behaviors of African American women, in relation to cervical cancer, Pap smears, and HPV. This study was approved by the Institutional Review Board at the University of Las Nevada, Las Vegas, in 2005.

Participants

The study consisted of 52 African American women, residing in Clark County, Nevada. Participants were informed that participation in the study was voluntary and totally confidential. Adhering to protection of subjects protocol, informed consent protocol was followed. Participant names were not included on any forms or surveys. Instead, each participant was assigned a number to protect their identity. In order to participate in the study, women had to be African American and over the age of eighteen years old.
Study Location and Selection Process

The sample consisted of a convenience sample; which incorporated snowballing techniques. In order to obtain a diverse sample, in terms of age, educational level, and income level, participants were recruited at both a local church and a local medical laboratory. At the local church, women were recruited as they exited from Sunday service. The purpose of the study was explained to the women. Women who agreed to participate in the study were taken into an adjacent room, where they could either complete the survey with the researcher, or independently.

Women recruited from the local medical laboratory were either clients or employees of the laboratory. Patients who walked into the laboratory were recruited upon entering/exiting the building. They were allowed to sit in an isolated and quiet area to complete the survey, independently or with the researcher. Women who were employed at the laboratory were recruited directly from their departments. After completion of the study, all women were given a handout from the American Cancer Society; which contained cervical cancer facts. Subsequently, any questions surrounding cervical cancer were addressed at that time.

Survey Instrument

The survey consisted of 14 questions; which could be completed in approximately ten minutes. Survey questions contained three demographic questions. These questions assessed age, educational level, and income level. These questions were: “What is your age?”, “What is your highest level of education?”, and “What is your income level?”. In order to assess health prevention behaviors, 1 question addressed Pap smear participation;
“How often do you get Pap smears?” Also, 1 question on condom use was utilized; “Do you use condoms?” Women were then asked to clarify “If not, why?” A group of questions surrounded knowledge. These included: “Do you know the purpose of Pap smears?”, “Do you know what HPV is?”, and “Do you know what cervical cancer is?”. Open ended questions were utilized to assess individual perceptions and perceived threats to health. These included questions such as: “What is the purpose of Pap smears?”, “How does one get infected with HPV?” and “What do you think the major cause of cervical cancer is?”. In order to assess the source of cervical cancer knowledge among African American women, the following questions were utilized: “How did you learn of the major cause of cervical cancer?” and “Has your physician provided information to you about the purpose of Pap smears and its significance to your health?”. It is important to assess access to healthcare services. Therefore, the survey asked “What type of medical coverage do you have?” and “Where do you usually go to get Pap smears?”.

Variables

The main variables studied were knowledge and behaviors (Table 1). Research question #1 sought to uncover the knowledge and perceptions of African American women, in relation to cervical cancer. Knowledge was assessed by determining perception surrounding the following: the purpose of Pap smears, the major cause of cervical cancer/relationship of HPV to cervical cancer, and the mode of transmission for HPV. Research Question number 2 sought to determine the disease prevention behaviors of African American women, in relation to cervical cancer. Disease prevention behaviors examined were Pap smear frequency and condom use (Table 1).
Table 1  Variables and Corresponding Survey Questions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Do you know the purpose of Pap smears?</td>
</tr>
<tr>
<td></td>
<td>If yes, what is the purpose of Pap smears?</td>
</tr>
<tr>
<td></td>
<td>Do you know what HPV is?</td>
</tr>
<tr>
<td></td>
<td>Do you know what cervical cancer is?</td>
</tr>
<tr>
<td></td>
<td>What do you think the major cause of cervical cancer is?</td>
</tr>
<tr>
<td></td>
<td>How does one get infected with HPV?</td>
</tr>
<tr>
<td>Behavior</td>
<td>How often do you get Pap smears?</td>
</tr>
<tr>
<td></td>
<td>Do you use condoms?</td>
</tr>
<tr>
<td></td>
<td>If not, why not?</td>
</tr>
<tr>
<td>Access to Care</td>
<td>What type of medical coverage do you have?</td>
</tr>
<tr>
<td></td>
<td>Where do you usually go to get Pap smears?</td>
</tr>
</tbody>
</table>

Health Belief Model

The Health Belief Model surrounds the premise that health behaviors are influenced by individual knowledge and perceptions. In other words, behavior stems from perceptions of threats to individual health. Relating to this study, we sought to identify whether the behavior of African American women, relating to cervical cancer prevention (Pap smears and condom use), were influenced by knowledge and perceptions. Research Question #3 sought to identify these relationships. A major premise of the study was that lack of knowledge would lead to poor Pap smear participation and failure to utilize condoms. On the other hand, women with accurate knowledge surrounding cervical cancer would tend to have frequent Pap smears and utilize condoms more often.
Access to Care

Research Question #4 sought to determine the effects of access to care issues on cervical cancer prevention behaviors (Table 1). In specific, we sought to determine the effects of the type of medical coverage (or lack of) and type of healthcare facility utilized on Pap smear frequency.

Statistical analysis

Data was analyzed utilizing the Statistical Package for Social Sciences (SPSS), version 15.0. The following statistics were derived: descriptive statistics, Log-Likelihood Statistics, and Odds Ratios.
CHAPTER 4

RESULTS

Demographics

Age

Although data was collected on a continuous variable, ages were categorized in order to obtain a more thorough understanding of study participants. Age was divided into five groups (Table 2). Over 40% of women were between 18 and 34 years old. Slightly over 50% fell in the 35-44 year old and 45-54 year old age groups. 3.9% of study participants were aged 55 years and above.

Education

In order to gain a more thorough understanding of survey participants, categorical responses were collected which demonstrated the participants’ highest level of education completed (Table 2). 10.4% had achieved at least a high school education. 73.0% had some college or technical training. 16.6% had achieved an undergraduate, graduate, or professional level of education. Four participants did not identify their highest level of education.
Income

A close-ended question asked participants to identify their income level (Table 2). Survey results revealed that 12 (26.7%) earn $15,000 or less per year. In addition, 7 (15.6%) earned $15,000-$25,000 per year, 14 (31.1%) earned $25,000-$35,000 per year, and 8 (17.8%) earned $35,000-$45,000 per year. A significant number of women did not respond to this survey question.

Table 2: Demographic Characteristics

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24 years</td>
<td>6</td>
<td>11.8</td>
</tr>
<tr>
<td>25-24 years</td>
<td>17</td>
<td>33.3</td>
</tr>
<tr>
<td>35-44 years</td>
<td>13</td>
<td>25.5</td>
</tr>
<tr>
<td>45-54 years</td>
<td>13</td>
<td>25.5</td>
</tr>
<tr>
<td>55-65 years</td>
<td>2</td>
<td>3.9</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;High School</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High School</td>
<td>5</td>
<td>10.4</td>
</tr>
<tr>
<td>Technical Training</td>
<td>8</td>
<td>16.7</td>
</tr>
<tr>
<td>Some College</td>
<td>27</td>
<td>56.4</td>
</tr>
<tr>
<td>BA/BS</td>
<td>4</td>
<td>8.3</td>
</tr>
<tr>
<td>Graduate/Professional</td>
<td>4</td>
<td>8.3</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>4</td>
<td>8.9</td>
</tr>
<tr>
<td>&lt;$15,000/year</td>
<td>8</td>
<td>17.8</td>
</tr>
<tr>
<td>$15-25,000/year</td>
<td>7</td>
<td>15.6</td>
</tr>
<tr>
<td>$25-35,000/year</td>
<td>14</td>
<td>31.1</td>
</tr>
<tr>
<td>$35-45,000/year</td>
<td>8</td>
<td>17.8</td>
</tr>
<tr>
<td>$&gt;$45,000/year</td>
<td>4</td>
<td>8.9</td>
</tr>
</tbody>
</table>
Knowledge

Pap Smears

In an open-ended format, participants were asked if they knew the purpose of Pap smears. A mere 3 of 48 respondents (6.3%) did not know the purpose of Pap smears. Forty-five participants (93.8%) responded “yes”; indicating that they did know the purpose of Pap smears. However, when asked an open ended question requiring the participants to explain the purpose, only 12 (25.5%) specified that the purpose is to detect cervical cancer, specifically. An additional 20 (43.6%) responded that the purpose of Pap smears is to detect tumors or cancer (non-specific type). Two participants (4.3%) identified the detection of HPV as the purpose of Pap smears.

Cervical Cancer

Data was collected on a closed-ended variable in order to gain an understanding of knowledge surrounding cervical cancer. Forty-three (86.0%) of study participants responded affirmatively, indicating that they indeed knew what cervical cancer was. Fourteen percent of African American women surveyed indicated that they did not know what cervical cancer was.

Participants were asked the open-ended question, “What do you think the major cause of cervical cancer is?” Responses were later grouped into meaningful categories. The categories were as follows: “unknown”, “HPV specific”, “sexual contact”, “infections (non-HPV)”, “infrequent Pap smears”, and “other”. It should be noted that 8 participants did not answer this question. Of the 44 participants who responded, 11 (25%) specifically identified HPV as the major cause of cervical cancer. 14 (31.8%) responded that the major cause of cervical cancer was unknown to them. The remaining participants
responded in the following manner: 7(15.9%) sexual contact, 1 (2.3%) infections, 5(11.4%) infrequent Pap smears, and 6(13.6%) yielded responses that were grouped into the other category. Examples of “Other” responses are as follows: “rough sex”, “heredity”, “abortion”, “hormone changes after menopause”, and “douching”.

**HPV**

African American women were asked to identify whether they knew what HPV was (Table 8). Seven participants (14.0%) were “unsure”. Eleven (22.0%) did not know. However, 32 (64.0%) answered affirmatively. An open-ended question asked participants to identify the mode of HPV transmission. A significant number of participants did not respond to this question; translating into 15 (28.8%) missed responses. Of the 37 who responded, 29 (78.4%) identified unprotected sex as the mode of HPV transmission. Subsequently, 8 (21.6%) admitted to not knowing how HPV is transmitted.

**Behaviors**

**Pap smears**

Study participants were asked the question, “How often do you get Pap smears?”. The categories from which to choose were: “I have never had a Pap smear”, “Once every year”, “More than once a year”, “Every 3-5 years”, and “every 5-7 years”. Forty-two participants (84.3%) revealed that they receive Pap smears at least once every year. Over 10% admitted to receiving Pap smears either “every 3-5 years” or “every 5-7 years”.

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**Condom use**

In order to obtain a firm understanding of the cervical cancer prevention behaviors of African American women, survey participants were asked whether or not they utilize condoms. Over half, 54.9%, responded that they do not use condoms. When asked to clarify “No” responses, 3 (15.8%) stated that they did not utilize condoms due to the fact that they were in monogamous relationships. 7 (36.8%) were married, 8 (42.1%) were abstinent, and 1 participant was placed in the “other” category.

**Source of Knowledge**

In an open-ended question format, participants were asked to identify the source of their cervical cancer education. It was important to identify effective portals of health education for African American women. Over one-fourth of participants did not respond to this survey question. Of the 38 respondents, over one-third (34.2%) never learned the cause of cervical cancer. A proportion, 23.7%, of respondents claimed to be “self-educated”. Only 5 (13.2%) identified physicians as their source of cervical cancer education. The remaining responses were as follows: 5 (13.2%) received cervical cancer education from friends and 2 (5.3%) from the media.

In order to gain an understanding of that role that physicians play in the health education of African American women, participants were asked, “Has your physician provided information to you about the purpose of the Pap smear and its significance to your health?”. The majority of participants, 36 (70.6%) answered “yes”. Those who answered “yes” were asked to identify the method in which they were educated on cervical cancer. They were given four options to choose from; brochure, video, pamphlet,
or verbal. All participants received cervical cancer education in the form of either a brochure or a pamphlet. No participants identified videos or verbal instruction as the method of education.

Access to Care

Healthcare coverage/insurance

Participants were asked to identify the type, if any, of medical coverage/insurance they had. They were given four options: “none”, “private”, “Medicaid”, or “other”. Those who chose “other” were provided a space to clarify their response. A substantial number, 10%, had no healthcare coverage. However, results revealed that 90% did have medical coverage; 39 (78.0%) private, 4 (8.0%) Medicaid, and 2 (4.0%) “other”. One participant clarified her “other” response as “group health/HMO”. The second “other” response was not clarified.

Healthcare facility

When exploring the effects of healthcare facility on knowledge and behaviors, participants were first asked to identify the type of healthcare facility where Pap smears are received. They were given four options: free clinic, private practice, HMO, or “other”. There was one “other” response, which was not clarified. Over 90% receive Pap smears at private practices and 4.3% at free clinics. There were 6 missing responses.
Research Questions

Research Question #1: What is the knowledge level of African American women, in relation to cervical cancer, in Clark County, Nevada?

Hypothesis 1A: Less than 70% of the women surveyed will know that the purpose of Pap smears is to screen for cervical cancer.

It was paramount to assess whether or not women had accurate knowledge and perceptions surrounding cervical cancer. Results revealed that 25.5% of participants specified the detection of cervical cancer as the purpose of Pap smears (Table 3). However, 43.6% listed the detection of tumors and cancer as the purpose (not cervical cancer specific). An additional 4.3% identified the detection of HPV as the purpose of Pap smears. It should be noted that 5 (9.6%) of study participants did not respond to this survey question. Thus, as predicted by Hypothesis 1A, less than 70% of participants were able to identify cervical cancer, specifically, as the purpose of Pap smears.

Table 3: Cervical Cancer Knowledge

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Correct number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose of Pap Smears</td>
<td>12</td>
<td>25.5%</td>
</tr>
<tr>
<td>Major Cause of Cervical Cancer</td>
<td>11</td>
<td>25.0%</td>
</tr>
<tr>
<td>HPV Transmission</td>
<td>29</td>
<td>78.4%</td>
</tr>
</tbody>
</table>

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**Hypothesis 1B:** Less than 50% of women surveyed will be able to identify HPV as the major cause of cervical or accurately state its mode of transmission.

One of the survey questions utilized to assess participants' level of HPV knowledge was “What is the major cause of cervical cancer?”. Survey results revealed that only 11 (25.0%) of study participants were able to identify HPV as the major cause of cervical cancer (Table 3). In addition, 8 (15.4%) of women surveyed did not answer this question. Thus, the part 1 of this two part hypothesis was upheld.

Women were asked to identify the mode of transmission for HPV; which was assessed by the question, “How does one become infected with HPV?”. This was an open-ended question which was later grouped into correct and incorrect responses. Responses which involved sexual contact were counted as accurate/correct. Survey results revealed that 29 (78.4%) were able to identify “sexual contact” as the mode of transmission for HPV (Table 3). Please note that 15 (28.8%) of women surveyed did not respond to this survey question. Therefore, there was no support for part 2 of this hypothesis.

**Hypothesis 1C:** At least 50% of women surveyed will have false perceptions of the cause of cervical cancer.

When participants were asked to identify the major cause of cervical cancer, 75% were unable to specify HPV as the cause (Table 3). Most of these women were, however, able to identify various contributing factors to the development of cervical cancer, such as “multiple sexual partners” and “not getting enough Pap smears”. Interestingly, a variety of misconceptions were identified, such as: “heredity”,

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"douching", "abortions", and "use of tampons". Those with total misconceptions surrounding the cause of cervical cancer comprised approximately 13.6% of the total sample. Please take note that 15.4% of the sample failed to respond to this question. Missing responses were not included in the final statistical analysis of this question. Thus, a substantial number of participants had misperceptions surrounding the cause of cervical cancer; believing that either contributing factors or false assumptions were major contributors to the cause of cervical cancer. Results provided support for Hypothesis 1C.

**Hypothesis 1D:** Accurate knowledge of cervical cancer, Pap smears, and HPV will be equally distributed across level of education, income level, and age.

Log-Likelihood Ratio (G) analyses revealed that accurate knowledge was equally distributed across age groups, educational and income levels. Thus, knowledge was not associated with age, education, or income levels, in regards to cervical cancer, Pap smears, and HPV.

Knowledge surrounding the purpose of Pap smears was equally distributed across age groups (G=8.72, d.f. =4, p=.068). Therefore, fail to reject H₀. Knowledge surrounding the major cause of cervical cancer was equally distributed across age groups (G= 6.55, d.f. =4, p=.162). Therefore, fail to reject H₀. Knowledge of the mode of transmission for HPV was equally distributed across age groups (G=4.26, d.f.=4, p=.372) Thus, fail to reject null hypothesis of no association.

Knowledge of the purpose of Pap smears was equally distributed across income levels, based on Likelihood ratio (G=4.07, d.f.=5, p=.539). In addition Knowledge surrounding the major cause of cervical cancer was not associated with income level.
(G=5.89, d.f.=5, p=.316). As expected, knowledge that HPV is sexually transmitted was not associated with income level, as well (G=7.15, d.f.=5, p=.167).

As predicted, level of education was not associated with knowledge surrounding the purpose of Pap smears (G=1.95, d.f.=4, p=.745). Knowledge of the relationship between HPV and cervical cancer was equally distributed across level of education (G=3.96, d.f.=4, p=.412). Subsequently, level of education was not associated with knowledge surrounding the mode of transmission for HPV (G=7.29, d.f.=4, p=.121).

Research Question #2: What are the behaviors of African American women, in relation to cervical cancer prevention, in Clark County, Nevada?

Hypothesis 2A: At least 90% of participants will report having frequent Pap smears.

According to percentage and frequency data, 48 (94.1%) of participants receive frequent Pap smears. In this study, frequent Pap smears are defined as those received more than once a year, once a year, and once every 3-5 years. Those who have never had a Pap smear or receive Paps every 5-7 years were deemed as infrequent. Thus, Hypothesis 2A was upheld through descriptive statistical analysis of data.

Hypothesis 2B: Approximately 50% of participants will report condom use.

As expected, less than 50% of survey participants reported condom use. Of the women surveyed, 23 (45.1%) reported not using condoms and 28 (54.9%) reported utilizing condoms. Thus, results provide support for this hypothesis.
Hypothesis 2C: Cervical cancer prevention behaviors will be equally distributed across age, income level, and level of education.

Likelihood ratio (G) analyses provided support for the fact that behavior was equally distributed across educational levels, in regards to condom use and frequency of Pap smears. However, there exists a difference in regards to the distribution of Pap smear participation across ages and income levels. Thus, frequent Pap smears are associated with age and income levels (Table 4). When Pap smear prevention behaviors were analyzed against age levels, results demonstrated that age was associated with frequent Pap smears ($G=11.25$, d.f.=4, $p=.024$), but not with condom use ($G=7.72$, d.f.=4, $p=.102$). As expected, level of education did not have an impact on condom use ($G=3.05$, d.f.=4, $p=.549$) and Pap smear frequency ($G=3.57$, d.f.=4, $p=.466$). Frequency of Pap smear was shown to have an association with income level ($G=14.87$, d.f.=5, $p=.011$). As anticipated, condom use was equally distributed across income levels ($G=7.22$, d.f.=5, $p=.205$).
Table 4: Distribution of cervical cancer prevention behaviors across demographic characteristics

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Prevention Behavior</th>
<th>Log-Likelihood Ratio</th>
<th>d.f.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Condom use</td>
<td>7.72</td>
<td>4</td>
<td>.102</td>
</tr>
<tr>
<td></td>
<td>Frequency of Paps</td>
<td>11.25</td>
<td>4</td>
<td>.024</td>
</tr>
<tr>
<td>Education</td>
<td>Condom use</td>
<td>3.05</td>
<td>4</td>
<td>.549</td>
</tr>
<tr>
<td></td>
<td>Frequency of Paps</td>
<td>3.57</td>
<td>4</td>
<td>.466</td>
</tr>
<tr>
<td>Income</td>
<td>Condom use</td>
<td>7.22</td>
<td>5</td>
<td>.205</td>
</tr>
<tr>
<td></td>
<td>Frequency of Paps</td>
<td>14.87</td>
<td>5</td>
<td>.011</td>
</tr>
</tbody>
</table>

**Research Question #3:** How is knowledge related to participation in cervical cancer prevention behaviors, among African American women, in Clark County, Nevada?

**Hypothesis 3A:** Women with false perceptions/inaccurate knowledge surrounding cervical cancer are less likely to participate in frequent Pap smears compared to those with accurate perceptions.

Knowledge surrounding the purpose of Pap smears, major cause of cervical cancer, and the mode of transmission for HPV were utilized. In order to examine the effects of accurate knowledge on cervical cancer prevention behavior, responses were first grouped into “correct” or “incorrect” responses. In relation to knowledge surrounding the purpose of Pap smear, “correct” responses were: “infection/HPV specific”, “tumors/cancer”, and “cervical cancer” specific. Responses which were counted as incorrect were “abnormalities” and “other”. In order to define the major cause
of cervical cancer, responses identifying HPV were counted as “correct”. All other responses were placed in the “incorrect” category. For mode of transmission, all responses surrounding sexual contact were deemed as “correct”. All other responses were placed in the “incorrect” category.

Risk analyses revealed that women with accurate perceptions/knowledge surrounding cervical cancer were more likely to participate in frequent Pap smear screening compared to those with inaccurate knowledge and misperceptions (Table 5). Women with accurate knowledge surrounding the purpose of Paps were 1.9 times as likely participate in frequent Pap smears compared to those with incorrect knowledge/perceptions. Women with accurate knowledge surrounding the relationship between HPV and cervical cancer were 2.6 times as likely to participate in frequent Pap smears compared to those with inaccurate knowledge. In addition, those with accurate knowledge surrounding the purpose of Pap smears were .50 times as likely to have frequent Pap smears compared to those with misperceptions. Thus, hypothesis 3a was supported by statistical analysis.
Table 5: Relationship between cervical cancer knowledge and disease prevention behaviors

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Behavior</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose of Pap smears</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequent Pap smears</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>Condom use</td>
<td>1.9</td>
</tr>
<tr>
<td>Major Cause of Cervical Cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequent Pap smears</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Condom use</td>
<td>2.2</td>
</tr>
<tr>
<td>HPV mode of transmission</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequent Pap smears</td>
<td>.50</td>
</tr>
<tr>
<td></td>
<td>Condom use</td>
<td>1.4</td>
</tr>
</tbody>
</table>

_Hypothesis 3B: Women with false perceptions/inaccurate knowledge surrounding cervical cancer are less likely to utilize condoms compared to those with accurate knowledge._

Through the analysis of risk, it was revealed that condom use is influenced by knowledge and perceptions for this population of women (Table 5). Women with accurate perceptions surrounding the purpose of Pap smears were 1.9 times more likely to utilize condoms compared to those with inaccurate knowledge. Women who accurately identified the cause of cervical cancer were 2.2 times as likely to utilize condoms. Moreover, women who were cognizant of the fact that HPV is sexually transmitted were 1.4 times as likely to utilize condoms compared to those without this knowledge.
**Research Question #4**: How are cervical cancer prevention behaviors affected by access to healthcare?

**Hypothesis 4A**: Frequency of Pap smears is dependent upon type of medical coverage.

An important goal of this research was to determine the effects medical coverage on Pap smear frequency/participation. Through the use of a Log-Likelihood statistics, it was determined that observed values did not differ from expected values. Thus, Pap smear frequency was not shown to be associated with type of medical coverage ($G=13.124$, $d.f.=12$, $p=.360$).

**Hypothesis 4B**: Frequency of Pap smears is dependent upon type of healthcare facility utilized.

When original data on Pap smear frequency was analyzed against healthcare facility utilized, no differences in participation were uncovered. Thus, it was found that frequency of Pap smear did not vary between type of healthcare facilities utilized by study participants ($G=7.420$, $d.f.=4$, $p=.115$).
CHAPTER 5

DISCUSSION

Demographics

The ages of survey participants ranged from 18-59 years old. The mean age of participants was 38.4 years old. The median age was 36 years old. Thus, the sample consisted of a diverse group of women, in terms of age. Age has been shown to affect the incidence and prevalence of various diseases and illnesses, especially chronic diseases. Although cervical cancer is more prevalent among women around the age of 47 (Harvard School of Public Health, 2006), it is important to intervene at younger ages. The purpose is to prevent disease or identify lesions in the early stages, before they become high grade lesions or cancer. Thus, when knowledge and behavior is assessed at younger ages, interventions may prove more effective in reducing morbidity and mortality later in life.

It was unexpected to find that over half of the sample reported having some college education. This varies from nationally reported statistics; which reports 17.5% of the population of A.A. women having at least a bachelor’s degree level education (U.S. Census Bureau, 2007). In comparison, 27.8% of White women are recorded as having at least a bachelor’s degree (U.S. Census Bureau, 2007). Moreover, no participants reported having achieved less than a high school education; which varies from the
average percentage of 20.5% of A.A. women having less than a high school education (U.S. Census Bureau, 2007).

Since statistics demonstrate low income and poverty as risk factors for the development of disease, a goal of this research was to determine the income levels of participants and to examine income levels in regards to knowledge and behaviors. Studies revealed that 42.2% have incomes of $25,000/year or less. Almost all, 91.1% of study participants earn less than the real median income for all households of $48,000/year (U.S. Census Bureau, 2007). It could not be determined if survey participants were classified as low income or impoverished; due to the fact that family size and living/family situations were not determined for each. That is, researchers did not determine whether or not women were single, married, had children, lived alone, or lived at home/ with parents, etc. Results did demonstrate that almost 10% of participants had incomes of over $45,000/year. Thus, the sample proved to be diverse in terms of income level; which is important to the applicability of results.

Knowledge

Research Question #1

Based on the premise that behavior is affected by knowledge, researchers attempted to determine the knowledge level of participants, in relation to cervical cancer. Knowledge was assessed through various research questions. Participants were asked whether or not they knew the following: a) what cervical cancer is b) the purpose of Pap smears c) the major cause of cervical cancer d) what HPV is, and e) the mode of transmission for HPV.
In relation to Hypothesis 1A, although a great proportion of participants had a general idea of the purpose of Pap smears, more education is needed. It was shown that although 93.8% of participants claimed to know the purpose of Pap smears, when asked to clarify the purpose, only 25.5% specifically identified the detection of cervical cancer as the purpose of Pap smears. A substantial number, 43.6%, were cognizant of the fact that tumors/cancers (unspecified type) could be detected through Pap screening. Additionally, 4.3% believed that HPV could be detected via Pap smears. It is true that changes caused by HPV can be visualized through microscopic evaluation of cytology cervical samples. However, since most HPV infections are asymptomatic, detection is performed through the use of HPV (DNA) typing.

As related to Hypothesis 1B, an important aim of this research was to explore whether or not African American women were cognizant of the connection between Pap smears, cervical cancer and HPV. Participants were asked, “Do you know what HPV is?” Only 32 (64%) claimed to know what HPV was. An additional 36% were either “unsure” or stated that they “didn’t know” what HPV was. When asked how one becomes infected with HPV, only 29 out of 52 (78%) participants responded correctly; stating sexual contact as its mode of transmission; 15 out of 52 (28.8%) participants did not respond. Women were asked, “What do you believe the major cause of cervical cancer is?” Results revealed that there exists an enormous lack of understanding surrounding the relationship between HPV and cervical cancer. Interestingly, 86.0% of A.A. women surveyed affirmed knowing what cervical cancer was, only 25% knew that HPV is the main perpetrator in the development of cervical cancer. Survey participants did have a vague understanding of associated risk factors, such as: multiple sexual
partners, infrequent Pap smears, multiple pregnancies, and having sex at an early age, etc. However, as related to Hypothesis 1C, flags signaling intervention were raised when 13.6% of participants erroneously believed that factors such as “genetics/heredity”, “tampon use”, “douching”, and “rough sex” played a major role in the development of cervical cancer. Thus, although the majority of women have at least a vague understanding of the cause of cervical cancer, intervention is needed to clear up misperceptions.

In response to Hypothesis 1D, knowledge was shown to be equally distributed across age, income, and educational levels. This varies from previous studies, which show that knowledge and behaviors are associated with these factors (Hislop, 2004; Radecki, 2005). Overall responses to Research Question #1 reveal that cervical cancer awareness is not consistent among African American women. Moreover, many women are not precise in their understanding of what HPV is and how HPV is transmitted; potentially affecting prevention behaviors.

Behaviors

Research Question #2

Research Question #2 sought to assess the cervical cancer prevention behaviors of African American women. The behaviors targeted by this study were frequency of Pap smears and condom use. In relation to results for Hypothesis 2A, infrequent or irregular Pap smears have been cited as a contributing factor to the development of high grade cervical lesions and cervical malignancies. In accordance with national data on Pap smear participation, over 84.3% of survey participants undergo Pap testing at least once a
year. Healthy People 2010 data which demonstrates that 83% of African American women reported having had a Pap test within the preceding year (CDC, 2007). Subsequently, 94.1% of participants reported receiving Pap smears frequently; which, in this study, was defined as more than once a year, once a year, and every 3-5 years.

Hypothesis 2B sought to examine condom use within the population of African American women. Condom use appears to be an enormous obstacle to cervical cancer prevention in this sample of African American women. Again, it should be pointed out that since condoms provide limited protecting against the spread of HPV; public health interventions have not promoted their use as protection against Human papillomavirus. Even though 78.0% knew that HPV was sexually transmitted, only 54.9% were motivated enough to utilize condoms for protection; 45.1% stated lack of condom use. Condom use findings are consistent with findings of a well respected survey which suggests that 45% of African American women have “never” utilized condoms (Grinstead et. al., 1997). In this study, women who reported lack of condom use were asked to explain reasons why. Examples of reasons given include, but aren’t limited to the following: monogamous/long term relationship, marriage, and abstinence. These responses suggest that some women may harbor a false sense of security. That is, they may not utilize condoms because they feel that are not susceptible to sexually transmitted infections. Women need to be educated about the fact that long term or monogamous relationships do not, necessarily protect from sexually transmitted infections. Furthermore, sexual intercourse with men who have a history of multiple sexual partners is a risk factor cervical cancer. An important contributing factor to the lack of condom
use in A.A. women may surround the fact that a large percentage of women in this study either did not respond or were not able to identify the mode of transmission for HPV.

Hypothesis 2C sought to assess the relationship between knowledge and various demographic characteristics of the women sampled. Analysis of data revealed that age and income level had an effect on Pap participation. Level of education was shown to have no effect on Pap smear participation. There was no relationship between condom use and age, income level, or level of education, as demonstrated by Log-Likelihood ratios. This results vary from previous studies, which consistently express the relationship between age, income, education on disease prevention behaviors (CDC, 2007; Hislop, 2004; Radecki, 2005). Findings of this study may be related to the small sample size.

Health Belief Model

Research Question #3

Research Question #3 sought to put the premise of the Health Belief model to the test. As proposed by the Health Belief Model, are cervical cancer prevention behaviors associated with knowledge and perceptions? Results consistently demonstrated that accurate knowledge was associated with participation in cervical cancer prevention behaviors (Hypotheses 3A & 3B). Odds ratios (O.R.) revealed that the largest impact of knowledge on behavior surrounded whether or not women had accurate perceptions of the major cause of cervical cancer. Women who knew that HPV was the major cause of cervical cancer were 2.6 times as likely to receive frequent Pap smears and 2.2 times as likely to utilize condoms, compared to women with inaccurate knowledge. This is challenging, considering that only 25% of participants have accurate knowledge.
surrounding the major cause of cervical cancer. Thus, public health interventions promoting HPV as the cause of cervical cancer could motivate African American women to utilize cervical cancer prevention behaviors. Knowledge surrounding the mode of transmission had the least impact on Pap smear participation (O.R.=1.4) and condom use (O.R.=.50). Survey results upheld the premise of the Health Belief Model; demonstrating the positive affects of knowledge on behavior.

Access to Care

Research Question #4

A concern of the study surrounding the effects of access to care on knowledge and behavior, in regards to cervical cancer. When asked to identify type of medical coverage, over 90% had medical coverage/insurance. The majority of respondents, 78%, had private insurance. Only 4% had Medicaid; which suggest that these women can be classified as low income; given Medicaid guidelines. Most participants receive Pap smears at private medical facilities. A small percentage, 4.3%, receives Pap smears at free clinics. Thus, participants receive medical care in a variety of settings.

Research Question #4 sought to uncover the relationship between access to healthcare on cervical cancer prevention behaviors, namely Pap smear participation. It was determined that neither type of medical coverage nor type of healthcare facility utilized was associated with Pap smear participation (Hypotheses 4A & 4B). These results were similar to a previous study conducted by Hewitt et. al. (2004), which demonstrated that Pap smear participation rates were similar in women who had Medicaid and women who had private insurance. However, this same study
demonstrated that Uninsured women are less likely to participate in cervical cancer screening (Hewitt, 2004). Results of this study could have been affected by the small sample size, as well as the lack of random sampling.

Limitations of the Study

Current public health efforts have focused on the advocating of frequent Pap smears and vaccination with the new HPV vaccine, Ghardasil® (Merck & Co., Inc.). Unfortunately, Ghardasil® was still in the approval process during the conducting of this research. It has seen been approved for use. Thus, media coverage of this new vaccine has the potential to increase the knowledge level of African American women surrounding cervical cancer. Performing a post Ghardasil® examination of knowledge and perceptions among African American woman may be advantageous, in this instance.

Although this study was significant in relation to currently public health concerns, it was not perfect in its construct. One limitation relates to randomness. In this study, participants were not recruited randomly. Instead, participants were recruited utilizing a convenience sampling technique, including the “snowballing” technique. Lack of randomness may results in high inherent error rates. Also, lack of randomness may restrict the applicability of results. Random samples, which this is not, help to ensure that the sample of reflective of the target population. Due to time and resource constraints, random sampling techniques were not utilized. Researchers did, however, seek to obtain a diverse sample, in terms of age, income, and educational levels. A further limitation of the study was the sample size. The sample size was 52. However, many results were
based on fewer than 50 responses. This could explain why various study results were unexpected, or varied from previous research.

In this study, location of study is considered a limitation. A portion of the study was conducted in a local church. Women may not have been comfortable discussing sensitive issues, such as condom use, in this setting. This may have impacted survey results. Subsequently, the sensitive nature of some of the survey questions could have been problematic for all participants. Participants were, however, reassured of the confidential nature of responses.

Responses to survey questions were based on self-report. This could be considered a limitation of the study. For example, participants were asked how often they underwent Pap screening. Data collection was based on what the participant told the researcher. There was no comparison of what the participants said to actual or measurable behaviors (i.e. medical records). Thus, there was a possible discrepancy between reported data and actual data. In addition, participants were asked to recall various behaviors. This could lead to recall error; which could represent a limitation of the study, as well. For example, women may believe that they had a Pap smear three years ago; when, in actuality, it was five years ago.

Strengths of the Study

A major strength of this study surrounds the fact that little to no research has been performed surrounding African American women and cervical cancer, especially within the state of Nevada. This research provides valuable groundwork for future research and
public health intervention programs; with the potential of identifying culturally specific barriers to cervical cancer prevention behaviors and motivational factors.

The fact that women from various socioeconomic backgrounds were recruited was also a strength of this study. This yielded a diverse sample of African American women. Existing research tends to surround segments of the African American population, either low income or uneducated. This research included women of various income and educational backgrounds. This research serves to expand the current view of the impact of cervical cancer on the African American community; by capturing a more diverse sample.

Utilization of the Health Belief Model was another important strength. Traditional methods of public health interventions have not been successful in the African American community, in the case of cervical cancer. This pointed to the need for a more in-depth understanding of barriers to prevention. In regards to African American women, it was important to gain an understanding of individual perceptions of susceptibility to disease. Although it is important to note the effects of socioeconomic factors on disease prevention, it is also important gain an understanding of motivational factors such as individual perceptions of threat and susceptibility to disease.
A major aim of this research was to utilize the constructs of the Health Belief Model in gaining an understanding of cervical cancer prevention behaviors in African American women. The premise of this approach was based on the belief that lack of Pap smear participation and other prevention behaviors is directly related to knowledge and perceptions surrounding cervical cancer. Results of this study revealed that although the majority of African American women professed to have annual Pap smears; few have an accurate understanding of the purpose of Pap smears and the relationship of HPV to cervical cancer. Thus, somewhere along the line, healthcare providers and other public health professionals have been unsuccessful in educating African American women in the area of cervical cancer.

This study uncovered numerous misperceptions surrounding the purpose of Pap smears perceived susceptibility to cervical cancer; which may be influencing the health behaviors of African American women. Results of this study uphold the fact that disease prevention behaviors are influenced by personal perceptions of susceptibility and threats to individual health; as predicted by the HBM. Women who do not perceive themselves as susceptible to illness and disease are not likely to utilize prevention behaviors. Results support the belief that a great number of African American women do not have a
clear understanding of the cause of cervical cancer. Thus, they may not have a clear understanding of the importance of participating in frequent Pap smears and utilizing condoms.

Although results are consistent with national data on Pap smear participation, only slightly more than half are utilizing condoms. This demonstrates that African American women are cognizant of recommended cervical cancer screening guidelines. However they are not cognizant of the efficacy of condom use. This may be related to the fact that women who were either married or in long term/monogamous relationships, perceived themselves as not at risk for or susceptible to sexually transmitted diseases. This is, of course, not always an accurate assumption. Thus, healthcare professionals need to educate African American women on the benefits of condom use. African American women also need to be made aware of the fact that the past sexual behaviors of intimate partners may place them at risk for the development of cervical cancer.

Addressing Cervical Cancer Disparities

As mentioned above, this research surrounded the construct of perceived susceptibility. Other important constructs of the HBM were not utilized, including: perceived severity, perceived benefits of prevention behaviors, perceived barriers to prevention behaviors, feelings of self-efficacy, and individual cues to action. Future research should incorporate these constructs of the Health Belief Model into their design, in order to obtain a better understanding of motivational factors to disease prevention behaviors.
Paramount to conquering disparities in cervical cancer is the identification of effective sources of cervical cancer education. Results revealed that healthcare providers are not the primary source of cervical cancer education for African American women. They do, however, have the greatest opportunity to educate African American women about cervical cancer. Therefore, it important that healthcare professionals are encouraged to serve as healthcare educators to their patients. It is obvious that current interventions haven’t been effective in the African American community. A potential barrier to the effectiveness of interventions in this population of women may surround a lack of cultural competence on behalf of healthcare providers. Since the needs of patients vary by culture and ethnicity, health interventions must be culturally specific in order to achieve optimal outcomes.

One way to prepare healthcare professionals to provide effective care to African American women is to require frequent courses on the needs and barriers to healthcare in various populations. Since all healthcare professionals are required to complete a specified number of continue education credits in order to maintain their license, it may be beneficial to require that healthcare professionals take at least one cultural training course each licensing period.

This study could have been strengthened through the use of research which utilizes a random sample and a larger sample size. In addition, although valuable information pertaining to cervical cancer among African American women, in Clark County, Nevada was obtained through this study, knowledge can be furthered through the use of additional research. Based on the fact that this study demonstrated that knowledge was distributed equally across various demographic characteristics, future research
should target women from various age groups, income levels, and educational backgrounds.

Future research should utilize Community Based Participatory Research (CBPR). In CBPR, individuals from underrepresented groups are involved in research, from design to finish (Agurto et al., 2005). Oftentimes, research is based on what researchers believe the community needs. In CBPR, members of the community of interest (stakeholders) provide insight into the specific needs of the community. In addition, members of the community assist in conducting the actual research. The roles played by community stakeholders are determined by the researchers, and vary from study to study. In a study of Vietnamese-Americans, CBPR was associated with an increase in cervical cancer screening (Nguyen et al., 2006). Thus, CBPR has the potential to increase cervical cancer prevention behaviors within the African American community.

Future interventions should focus on the building of community coalitions/partnerships. One way to build community coalitions is to involve the community in cervical cancer prevention programs. In a recent study by Agurto et al. (2005), it was discovered that when community members were involved in a cervical cancer prevention program, numerous benefits emerged, including, but not limited to: enabling women of the community to make informed decisions about their health, encouraging women to take ownership of their own/individual health, providing insight into the misperceptions surrounding cervical cancer, providing insight into motivational factors to disease prevention behaviors, and increased sustainability of prevention programs. Thus, future efforts should involve placing prevention programs within the
communities of A.A. women, as well as involving A.A. women in the carrying out of the actual programs.

Cervical cancer education should be incorporated into the health education classes of middle and high school aged individuals. It is important to target this age group, before they participate in risky sexual behaviors or become exposed to HPV. It is important to educate this group of the risk factors and preventative measures of cervical cancer. This is especially important in high risk or underserved communities, such as African American communities. Currently, the Ghardasil® vaccine is targeting adolescents and women, up until the age of 26 years. Thus, it is important for these young women to have a full understanding of cervical cancer. Not only will this enable them to make informed decisions about whether or not they will receive the vaccine; but, it will also enable them make better healthcare decisions and possibly decrease at risk behaviors.

A potential method of increasing the cervical cancer knowledge of African American women is by requiring women who receive free or low cost Pap smears to attend educational seminars on cervical cancer, prior to receiving Pap smears. This could facilitate an improvement in follow-up to abnormal results. In addition, this knowledge could motivate A.A. women to better utilize prevention behaviors, such as condom use.

Although the incidence of cervical cancer has been on a steady decline, hundreds of thousands of women continue to die from this disease each year. Moreover, some racial and ethnic groups are disproportionately affected by cervical cancer. It is no secret that there exist a disparity in the mortality and morbidity of this disease. The key to conquering these disparities lay in understanding the underlying causes and culturally specific risk factors. As previously mentioned, a major goal of Healthy People 2010 is to
reduce death from cervical cancer. Additional goals of Healthy People 2010 are to increase Pap smear screening rates and reduce healthcare disparities, in general. The results of this study, if utilized effectively, carry the promise of aiding in this initiative.
REFERENCES


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APPENDIX I

INFORMED CONSENT

University of Nevada, Las Vegas
Center for Health Disparities Research

TITLE OF STUDY: Cervical Cancer: Knowledge and Behaviors of African American Women, Clark County, Nevada
INVESTIGATOR/S: Cecilia Fleming, Michelle Chino, Ph.D.

Purpose of the Study
You are invited to participate in a research study. The purpose of this study is to understand what African American women know about the causes and prevention of cervical cancer.

Participants
You are being asked to participate in the study because you are an African American adult woman. Recent studies have shown that African American women are at a high risk for cervical cancer.

Procedures
If you volunteer to participate in this study, you will be asked to do the following: You will be asked to complete a short questionnaire on your knowledge of pap smears, cervical cancer, Human Papillomavirus (HPV) and condom use. The questionnaire will take about 10 minutes of your time. No information that can identify you will be asked.

Benefits of Participation
There are no direct benefits of participation in this study. However, we hope to learn whether African American women have knowledge about cervical cancer, including its screening, causes, and prevention. We also hope to understand what information health care providers give to patients about cervical cancer.
Risks of Participation
There are risks involved in all research studies. This study may include only minimal risks. You may feel uncomfortable answering some of the questions. You do not have to answer any question that makes you uncomfortable. You may be concerned that someone else may know what you answered. We will not include your name or collect any information that can identify you, individually.

Cost/Compensation
There will be no financial cost to you to participate in this study. The study will take 10 minutes of your time. You will not be compensated for your time. The University of Nevada, Las Vegas may not provide compensation or free medical care for an unanticipated injury sustained as a result of participating in this research study.

Contact Information
If you have any questions or concerns about the study, you may contact Dr. Michelle Chino at 895-2649. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted, you may contact the UNLV Office for the Protection of Research Subjects at 895-2794.

Voluntary Participation
Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Confidentiality
All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for at least three years after completion of the study. After the storage time, the written information gathered will be shredded.

Participant Consent
I have read the above information and agree to participate in this study. I am at least 18 years of age. A copy of this form has been given to me. □ Yes □ No
APPENDIX II

SURVEY INSTRUMENT

Participant Questionnaire

What is your age? ______________

How often do you get Pap smears?

□ I have never had a Pap smear □ Once a year

□ More than once a year □ Every 3-5 years

□ Every 5-7 years

Do you know the purpose of Pap smears? □ Yes □ No

If yes, what is the purpose of Pap smears? ________________________________

Do you know what HPV is? □ Yes □ No □ Not sure

Do you use condoms? □ Yes □ No

If not, why? _______________________________________________________

Do you know what cervical cancer is? □ Yes □ No

What do you think the major cause of cervical cancer is?___________________

How did you learn of the major cause of cervical cancer?___________________
Has your physician provided information to you about the purpose of the Pap smear and its significance to your health?  
☐ Yes  ☐ No

If yes, information was provided in the following manner:

☐ Brochure  ☐ Video  ☐ Pamphlet  ☐ Verbally

What type of medical coverage do you have?

☐ None  ☐ Private  ☐ Medicaid  ☐ Other

Where do you usually go to get Pap smears?

☐ Free Clinic  ☐ HMO  ☐ Private Practice  ☐ Other

How does one get infected with HPV?

What is your highest level of education?

☐ Grade school  ☐ Middle school  ☐ High school  ☐ Technical training

☐ Some college  ☐ BA/BS  ☐ Graduate/Professional

What is your income level?

☐ Unemployed  ☐ less than $15,000/yr  ☐ $15,000-$25,000/yr

☐ $25,000-$35,000/yr  ☐ $35,000-$45,000/yr  ☐ More than $45,000/yr
VITA

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