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Factors Affecting Cervical Cancer Screening Among African Women Living in the United States

Mosunmola Adeyemi
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Walden University

College of Health Sciences

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Mosunmola Adeyemi

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2013

Abstract

Factors Affecting Cervical Cancer Screening Among African Women Living in the

United States

by

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M.P.H., Walden University, 2008

M.P.A., University of Lagos, 1987

B.A., University of Ife, 1980

A.S., Georgia Perimeter, 2005

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

December 2013

Abstract

More than half of the incidents and mortality rates from cervical cancer occur among minority groups, including immigrant women from continental Africa living in the United States. Although researchers have examined cervical cancer screening practices among minority populations, including Black women in Africa and in the United States, there are few studies on cervical cancer screening and associated risk factors, specifically among African women living in the United States. The purpose of this study was to investigate the association between selected factors and cervical cancer screening practices among African immigrant women living in the United States. Using the behavioral model for vulnerable populations as a theoretical basis, this cross-sectional quantitative study was focused on determining the association between family income, level of education, language of interview, insurance status, age, and perceived health status and cancer screening practices. Data on 572 African immigrant women from the National Health Interview Survey in 2005, 2008, and 2010 were used for the study. Chi-square tests and logistic regression were used to analyze the data. Key findings indicate that family income, education level, and age were significantly associated with cervical cancer screening practices among African immigrant women in the United States. Findings from the study support positive social change by targeting at-risk groups for cervical cancer screening programs. The long-term goal of early cervical cancer screening is to lower cervical cancer rates among African immigrant women in the United States. The findings from the study can be used by community health professionals to provide education that can lead to utilization of cervical cancer screening services based on guidelines and recommendations.

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Dedication

I dedicate this dissertation to God and my family. To my mother whose love, hard work, tenacity, and perseverance nurtured me. You provided me with the light to guide me along dark and lonely roads. You taught me to believe in myself and showed me that God never fails. Mama, you will always be my inspiration.

To my husband who has been with me since the beginning of this journey. Thank you for putting up with me through the years. To my children who continue to amaze me with their love, support, and dedication to the path I chose for myself. I love you so much and I am so proud of you. Joshua, thank you for being my first editor and providing constant encouragement. To Irene, for just being there and forcing me to take the much needed refresher breaks, Adetoun, for being the sounding board for my ideas. To Deke, for believing in me when I had doubts about my ability to do this. Thank you for sacrificing many hours of "mommy and me" time and giving me constant encouragement along the journey. Daughter of my womb, I love and appreciate you.

To my family, for believing in me and celebrating my success. To the entire Badiru/Orepo family, for blazing the trail that I have no choice but to follow. I have not removed the ancient landmarks that our fathers laid. I have continued on the trail and imprinted my feet on the sands of time. I challenge others to follow.

Finally, I dedicate this dissertation to all women that fought and lost the fight to cervical cancer. The battle may have been lost but the war will be won.

Acknowledgments

I acknowledge with gratitude the women who participated in the original National Health Interview Survey. Your participation provided me the data that I needed to conduct this study.

To Cassandra Arroyo, PhD, for working with me over the years. For providing me with constant support, guidance, and encouragement. Thank you for letting me share in your knowledge.

To Ji Shen, PhD, for your guidance and assistance with the methodology. Your expert opinion and prompt feedback contributed so much to the completion of this study.

To Amy Thompson, PhD, for your support and valuable contributions. I appreciate your professional guidance.

To the University of Minnesota, the repository of the Integrated Health Interview Survey. Thank you for providing me access to the data for this study

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Chapter 1: Introduction to the Study

Introduction

Cervical cancer is a health concern among women worldwide as it ranks as the second most common cause of cancer among women (World Health Organization [WHO], 2012). Cervical cancer can, however, be prevented with the use of early and regular cervical cancer screening (McLay, Foufoulides, & Merrick (2012). Cervical cancer screening can be carried out by the use of Papanicolaou (Pap) test that is used to detect abnormal changes on the cervix (Centers for Disease Control and Prevention [CDC], 2012). The abnormal cell changes detected early can be treated before becoming cancerous. According to Nelson, Moser, Gaffey, and Waldron (2009), many women do not take advantage of the benefits inherent in cervical cancer screening and may be at a high risk for developing cervical cancer. The objective of this study was to examine the cervical cancer screening practices among women from continental Africa who are living in the United States and the factors that affect their cervical cancer screening status. This study has implications for positive social change because the findings from the study can be useful in developing interventions that can reduce the morbidity and mortality of cervical cancer not only among the study population but also among women worldwide.

Background of the Study

Cervical cancer is a slow-growing cancer that begins in the cervix of women (CDC, 2012). The cervix is the lower end of the uterus that connects the vagina to the womb. Once the cancerous cells begin to grow, the abnormal cells can slowly invade the whole body to cause devastating effects on health (CDC, 2012). Although cervical cancer

is highly preventable and treatable if found early, many women still develop the cancer with grave outcomes. According to the CDC, cervical cancer occurring mostly in women over the age of 30 years used to be the leading cause of death among women in the United States. There has, however, been a significant decrease in the number of new and existing cases and deaths from cervical cancer in the last 40 years because of the introduction of the cervical cancer screening test in the 1950s (National Cancer Institute, n.d.).

While the effect of cervical cancer has diminished in the United States and other western countries, cervical cancer is still causing devastation among several minority groups including immigrants (Howell, Gurusinghe, Tabnak, & Sciortino, 2009). The guidelines from the American Cancer Society (2012) are that women should screen regularly for abnormal cervical cell changes and for the presence of human papillomavirus (HPV), the virus that is most often implicated in the cancer. When abnormal cell changes are detected early through screening, prompt treatment can prevent the abnormal cells from growing into invasive cancer (CDC, 2012). However, some minority groups may not take advantage of the available screening services and may suffer from invasive cervical cancer that can lead to poor health outcomes or even death (Woltman & Newbold, 2007). While some researchers have investigated the factors that affect the utilization of cervical cancer screening services among some minority groups (Downs, Smith, Scarinci, Flowers, & Groesbeck, 2008; Ross, Nunez-Smith, Forsyth, & Rosenbaum, 2008), there is a paucity of information on the factors that affect the

cervical screening status and practices of women from continental Africa who are living in the United States.

Cervical Cancer Screening Among African Women Living in Africa

There is a high prevalence of cervical cancer in Africa where the rate can be 15 times higher than those of women from Western countries such as the United States (Becker-Dreps, Otieno, Brewer, Agot, & Smith, 2010). The World Health Organization/Institut d'Oncologia (WHO/ICO; 2010) reported that cervical cancer ranks 10th in developed nations and second for women in Africa among all cancers. Nnodu et al. (2010) found a low level of awareness of cervical cancer and HPV among Nigerian women. Abotchie and Shokar (2009) found that lack of understanding of the benefits of cervical cancer screening was one of the factors that prevented African women from using cervical cancer screening services. Becker-Dreps et al., (2010) found that socioeconomic factors were limiting factors for cervical cancer screening among African women.

Cervical Cancer Screening Among Minority Groups

According to Downs et al. (2008), immigrant and foreign-born women living in the United States are not using early screening for cervical cancer as much as their native-born counterparts. Akers, Newman, and Smith (2007) stated that the disparity in early screening behavior is because of factors such as race, ethnicity, socioeconomic status, place of birth, insurance status, and access to health care services. While factors that affect cervical cancer screening have been examined among several minority groups including Korean Americans, American Indians, Hispanics, and Asian Americans, there

is a dearth of information on the specific factors that affect the screening rates among women born in continental Africa who are living in the United States. This study aims to fill that gap by providing evidence on some of the factors that may be associated with the cervical cancer screening behaviors among this growing population in the United States.

Problem Statement

The problem addressed in this study is that there is a need to determine what factors might be preventing African women living in the U.S. from engaging in early detection screening services that can ultimately reduce cervical cancer deaths (Lofters, Hwang, Moineddin, & Glazier, 2010). A global estimate of 500,000 diagnoses of cervical cancer cases are reported each year and 250,000 women die from cervical cancer (WHO, 2012). According to the National Cancer Institute (NCI, 2011), cervical cancer treatment costs over \$1.4 billion in the U.S. annually. Howell et al. (2009) argued that cervical cancer is preventable if women use early detection screening regularly and receive timely treatments for abnormal cell changes found in the cervix of women. Studies have been conducted to investigate cervical cancer screening status and the associated risk factors among African women living in Africa (Nnodu et al., 2010) and among African American living in the United States (McCarthy, Dumanovsky, Visvanathan, Kahn, & Schymura, 2010). There is a dearth of documented studies on cervical cancer screening and the associated risk factors among African women living in the United States. Women born in Africa and currently living in the United States may represent a high level of cases because they may not be using screening services for cervical cancer (Sanz-Barbero, Regidor, & Galindo, 2011).

Purpose of the Study

The purpose of this quantitative, cross-sectional study was to examine the factors that affect cervical cancer screening among African women living in the United States. I examined the association between cervical cancer screening, which is the dependent variable, and the independent variables of income, education, age, acculturation level, insurance status, and perceived health status among the study population.

Nature of the Study

In this quantitative cross-sectional study, I used secondary data collected by the National Health Interview Survey (NHIS). I gathered numerical data from the NHIS and conducted statistical analysis to determine if there were significant associations between the outcome variable and the independent variables. This research method is appropriate and preferred over other methods such as the qualitative or mixed methods. Unlike the qualitative method that uses open-ended questionnaires to find answers to or to explain a phenomenon, the quantitative method uses closed-ended questions, collects similar answers from participants, allows the answers to be measured numerically, and uses statistical procedures to test association between variables and to accept or reject the null hypothesis about the population (Creswell, 2009).

By using the quantitative method, I was able to use a predetermined instrument to collect data from a large sample in the population and make inferences about the target population. In this study, I investigated how socioeconomic status, education level, age, insurance status, acculturation, and perceived health status, affect cervical screening practices of women from continental Africa who were living in the United States at the

time of the study. Trained interviewers who used structured questionnaires collected the primary data for the study. An advantage of conducting the secondary analysis from data collected from a national survey such as the NHIS was that I had access to a large sample size and could generalize to the study population. I performed the test for the hypothesis by conducting chi-square analysis and logistic regression to predict the association between the independent and the dependent variables.

Research Questions and Hypotheses

The research questions and hypotheses for this study were developed based on the need to determine how length of stay in the United States, family income, educational level, acculturation, access to health care services, and perceived health status, affect cervical screening status of women from the continent of Africa who are living in the United States.

RQ1: Are socioeconomic factors, measured by family income and education level associated with cervical cancer screening status among African women living in the United States?

H_0 1: There is no association between socioeconomic factors, measured by family income and education level, and cervical cancer screening status among African women living in the United States.

H_a 1: There is an association between socioeconomic factors, measured by family income and education level, and cervical cancer screening status among African women living in the United States.

RQ2: Is insurance status associated with cervical cancer screening status among African women living in the United States?

H_02 : There is no association between insurance status and cervical cancer screening status among African women living in the United States.

H_a2 : There is an association between insurance status and cervical cancer screening status among African women living in the United States.

RQ3: Is acculturation, measured by language of interview, associated with cervical cancer screening status among African women living in the United States?

H_03 : There is no association between acculturation, measured by language of interview, and cervical cancer screening status among African women living in the United States.

H_a3 : There is an association between acculturation, measured by language of interview, and cervical cancer screening status among African women living in the United States.

RQ4: Is there a relationship between age and cervical cancer screening status among African women living in the United States?

H_04 : There is no relationship between age and cervical cancer screening status among African women living in the United States.

H_a4 : There is a relationship between age and cervical cancer screening status among African women living in the United States.

RQ5: Is participant's perception of health status associated with cervical cancer screening status among African women living in the United States?

H_05 : There is no association between perceived health status and cervical cancer screening status among African women living in the United States.

H_a5 : There is an association between perceived health status and cervical cancer screening status among African women living in the United States.

Theoretical Base

The theoretical base for this study is the Behavioral Model for Vulnerable Populations. The model was developed in the late 1960s, and it theorized that people used health services based on their predisposing, enabling, and need constructs (Andersen, 1995). The original model has been expanded to include measures of health services used for particular conditions and personal health behaviors and maintenance practices that influence health outcomes (Gelberg, Andersen, & Leake, 2000). The expanded model examines the main constructs of predisposing, enabling, and need under the traditional and vulnerable domains.

The predisposing traditional and vulnerable domains include individual characteristics such as age, gender, marital status, ethnicity, education, employment, family size, acculturation, immigration status, literacy, and childhood characteristics (Gelberg et al., 2000). The enabling traditional and vulnerable domains examine factors that enable or hinder the utilization of health services. These factors include personal and family resources such as income, social support, regular source of care, social support, perceived barriers to care, competing needs, public benefits, ability to negotiate within

the system, public benefits, self help skills and community resources such as residence, region, health services resources, crime rate, and social service resources (Gelberg et al., 2000). The need traditional and vulnerable domains include perceived health needs and evaluated health needs of the general population and the perceived and evaluated health needs that can be applied to vulnerable populations (Gelberg et al., 2000).

Definition of Terms

Acculturation: A process by which an individual or group from a culture comes into continuous first hand contact with other cultures. This contact may lead to assimilation of the sociolinguistic and cultural norms of the host country (Johnson, Carroll, Fulda, Cardarelli, & Cardarelli, 2010).

Access to health care: The timely use of personal health services facilitated by gaining entry into the health care system, finding a health care location that provides the needed services, and having a health care provider which the patient trusts and can communicate with (Healthy People 2020).

Age: Delineation of individuals into different groups based on their age for the purpose of calculating the health status of each group.

Cervical Cancer: A slowly growing cancer that begins in the cervix of a woman (CDC, 2012).

Educational level: The number of years an individual spent attending school for formal learning.

Human Papillomavirus (HPV): A type of sexually transmitted virus that may increase the risk for several diseases including cervical cancer (CDC, 2012).

Pap test: A test that is done during a pelvic exam. It involves the scraping of cells from the cervix and examining them under a microscope to see whether abnormal cells are present (National Cancer Institute, n.d).

Perceived health status: This is a measure of how an individual perceives his/her status as excellent, very good, good, fair, or poor (National Center for Health Statistics, 2011).

Socioeconomic status: Determined as high or low based on a measure of an individual's income and or educational attainment (Kaus, Piff, & Keltner, 2009).

Assumptions

There are several assumptions to this study. The first assumption is related to the self-report nature of the study. I assumed that participants' self-reports on the variables that are tested are accurate and reliable. Another assumption is that the questionnaires were administered properly and that there was no interviewer bias. I assumed that I am biased because of my public health background and previous personal experience with cervical cancer.

Limitations

A major limitation to this study is the method used in collecting data. By using secondary analysis, I was limited to the information that is available from the primary data set. The cross-sectional nature of the study may introduce recall bias or respondents may not give accurate answers on the information that is being collected (Singleton & Straits, 2005). I treated all women from Africa as one group. However, there are 57 countries in Africa and there may be variations in the association of the independent

variables to the dependent variables based on the specific countries. I did not explore variations based on differences between different African countries in this study.

Scope and Delimitations

The scope of the study was limited to African women that participated in the National Health Interview Survey. This survey was conducted on noninstitutionalized residents of the United States. The main delimitation of the study is that it provides information on a minority group in the country and the findings might be useful in understanding the factors that influence cervical cancer screening among this group and other multicultural groups.

Significance of the Study

This study is significant because the findings might be useful in improving the overall health of the country. The United States is a highly diverse country and is made up of people from different geographical locations in the world. The health of the country is influenced by the health choices of all individuals and groups (Healthy People 2020). Each year about 12,000 people are diagnosed with cervical cancer out of which there are 4,000 deaths (U.S Cancer Statistics Working Group, 2013). The cost of treating cervical cancer increases with the stage of diagnosis. Subramanian et al. (2010) estimated the cost of cervical cancer treatment for Medicaid patients to be \$3,807, \$23,187, \$35,853, and \$45,028 at 6 months for in-situ, local, regional, and distant cervical cancer, respectively. This cost increases to \$6,347, \$32,225, \$46,681, and \$83,494 at 12 months for the same stages respectively (Subramanian et al., 2010).

Since advances in medical science have shown that cervical cancer is preventable, efforts should be made to ensure that no individual or group suffers the ravages of this disease. The findings from this study will provide information on factors that affect the use of cervical cancer screening services among African women living in the United States. The findings from the study will be useful for positive social change that will include awareness of factors that predict cervical cancer screening practices.

Professionals in the field of Community Health can gain useful information to educate women and to develop interventions that will lead to and increase the utilization of cervical cancer screening services. These interventions can be useful in contributing to positive social change by reducing the morbidity, mortality, and the associated cost of cervical cancer.

Summary and Transition

In this chapter, I have discussed the background to the study and established a premise for studying the association between socioeconomic factors, age, education, access to health care services, acculturation level, perceived health status, and cervical cancer screening among women from continental Africa who are living in the United States. The sample for the study was drawn from noninstitutionalized women who identify Africa as their region of birth and who participated in the National Health Interview Survey.

In Chapter 2, I present a review of literature related to cervical cancer screening among different populations and the theoretical foundation for the study. This chapter shows that women from Africa may be at a high risk of having cervical cancer and that

there is the need to study the factors that may affect their screening practices so that appropriate interventions are developed and implemented. In the third chapter, I discuss the methodology that is used to conduct this research. Specific topics that I discuss in chapter three include the research design and rationale, the population, the sampling procedures and the data analysis plan. Chapter 4 is on the analysis of the data while Chapter 5 focuses on interpreting the results and making recommendations based on the findings.

Chapter 2: Literature Review

Introduction

Cervical cancer is a global health concern as the fourth most frequent cancer in all women and fourth leading cause of cancer deaths among females worldwide (Jemal et al., 2011). An estimated 2.3 million women ages 15 and older are at risk for developing cervical cancer (WHO/ICO, 2010). In 2008, the estimated global new cervical cancer cases and deaths were 529,000 and 274,000 respectively (Ferlay, Shin, Forman, Mathers, & Parkin, 2010). Improved screening practices and early interventions for abnormal cytological changes have led to significant decreases in the incidence and mortality from cervical cancer in developed countries such as the United States. However, the rate is still high among women in low-income countries where almost 80% of this cancer occurs (WHO/ICO). WHO/ICO estimated the annual new cases in these countries to be 453,321 with annual deaths of an estimated 241,969.

While cervical cancer used to be a leading cause of death among women in the United States, great strides have been made in reducing the burden from the disease due to advances in screening practices through the use of the Pap test and early diagnostic services. The cervical cancer death rate reduced from 3.49 per 100,000 in 1991 to 2.42 per 100,000 in 2007 (Siegel, Ward, Brawley, & Jemal, 2011). However, disparities in the burden of the disease still exist due to race, ethnicity, and socioeconomic status. In 2007, the incidence of cervical cancer among blacks was 10.2 per 100,000, 11.5 per 100,000 among Hispanics, and 7.5 per 100,000 among Whites (United States Cancer Statistics Working Group, 2013). It was estimated that there was 12,710 new cases of cervical

cancer in the United States in 2011 and 4,290 deaths in the same year (Siegel et al., 2011). The WHO/ICO (2010) estimated that by 2025 there will be an increase of 16.8% in new cervical cancer cases in the Americas and 24.97% in deaths. That means the number of cervical cancer cases and deaths are expected to go from 12,491 to 14,590 annual new cases and 4,431 to 5,515, respectively.

Minority women may be disproportionately affected by cervical cancer (Amankwah, Ngwakongwi, & Quan, 2009; Jensen et al., 2012). Studies have been conducted to investigate cervical cancer screening practices among minorities in the United States and to determine factors that affect these practices (Coker, DeSimone, Eggleston, White, & Williams, 2009; Han et al., 2011; Jensen et al., 2012; McDonald & Neily, n.d; Tabnak, Muller, Wang, Zhang, & Howell, 2010). However, very few researchers have examined these behaviors specifically among immigrant women from Africa (Bigby, Ko, Johnson, David, & Ferrer, 2003).

Reviewing the published literature is relevant in determining factors that have been found to influence cervical cancer screening behaviors among minority groups and multicultural populations. Understanding these factors and behaviors is important in understanding health behaviors of these groups and in developing appropriate interventions to meet their needs. In this chapter, I discuss general information on cervical cancer, factors contributing to the incidence of cervical cancer, the literature review on previous studies that have been done on how variables such as age, educational level, insurance status, socio economic status, acculturation status and other factors

contribute to the risk of cervical cancer. I will discuss the theoretical framework that informs the study and the implications of the research for social change.

Literature Search Strategy

I conducted a systematic review of literature to find relevant studies and articles that examine factors affecting cervical cancer and cervical cancer screening among different population groups. Some of the databases that I assessed include Science Direct, Academic Search Complete, Cinahl, Medline, Proquest, and PubMed. I assessed Google scholar to find relevant articles. The key words used in the search were *cancer screening, cervical cancer, cervical cancer screening and immigrants, immigrants, Africa and cervical cancer screening, cervical cancer screening and minorities*. I used these key words in different combinations so as to find as much relevant articles as possible. The initial search was limited to studies after 2006. I include studies and books that were published earlier than 2006 based on their relevance to the study. The searches yielded many articles and studies from which this researcher was able to identify a number of studies that are relevant to this research.

This literature review is organized into themes and subthemes. I examined literature in the following areas:

- Previous studies on cervical cancer in sub-Saharan Africa.
- Studies on cervical cancer among minority groups.
- Factors influencing uptake of cervical cancer screening.
- Theoretical framework and methodologies used in literature.

Theoretical Framework

Several of the researchers used for this study did not identify any theory within the published work. However, some of the literature integrated some theories of health behavior within the study. Theoretical frameworks that have been found useful in explaining health utilization services include the health belief model (Denny-Smith, Bairan, & Page, 2006; Guifoyle, Franco, & Gorin, 2007); behavioral model for vulnerable populations (Owosu et al., 2005); PRECEDE/PROCEED model (Juon, Seung-Lee, & Klassen, 2003); health investment model (McDonald & Kennedy, 2007); social cognitive theory (McKeever, 2008), and the transtheoretical model (Tung, Nguyen, & Tran, 2008). The model that will guide this study is the revised and expanded Behavioral Model for Vulnerable Population (Gelberg et al., 2000).

The behavioral model for vulnerable populations was developed in the late 1960s in an attempt to understand why people utilized health services. The focus of the model was on marginalized and vulnerable populations. Aday (2003) noted that the vulnerable are at risk for harm and neglect because of their social status, social capital, and human capital. The vulnerable groups are more predisposed to poor physical, psychological and social health and need special attention for their health needs to be met (Sui & Stevens, 2011). Aday identified several groups among the vulnerable in the United States. They include immigrants and refugees, abusive families, suicidal or homicidal persons, alcohol or substance abusers, mentally ill and disabled, persons living with HIV/AIDS, chronically ill or abused persons, and high-risk mothers and infants.

The original model was predicated on the premise that people utilize health services based on their predisposing characteristics such as demographics, social structure, and health beliefs; their enabling resources such as personal, family, and community resources, and their perceived need for care (Andersen, 1995). The model explains health beliefs as “attitudes, values, and knowledge that people hold about health and health services” (Andersen, 1995, p. 2) and posits that such beliefs have an impact on the perception of health need and subsequent utilization of services.

This model of health behavior has evolved over time and has been both expanded and revised to include measures of health services used for particular conditions and inclusion of personal health behaviors and maintenance practices as being associated with health outcomes. The updated model explains health behavior under two major domains – the traditional domain and the vulnerable domain – and the inclusion of the impact of utilization of health services on outcomes (Gelberg et al., 2000). These two domains are broken down into predisposing, enabling, and need factors that play significant roles in the utilization of health services and subsequent outcomes.

The factors that are considered under the traditional domains are demographic factors such as age, gender, marital status; health beliefs which includes values concerning health and illness, attitudes towards health services, and knowledge about diseases; social structure which includes ethnicity, education, employment, social networks, occupation, family size and religion. The predisposing vulnerable domains include social structure such as the country of birth, immigration status, acculturation and literacy level; sexual orientation; and childhood characteristics. Enabling factors include

personal and family resources, regular source of care, income, perceived barriers to care, social support, community resources such as health services, competing needs such as hunger, self-help skills, and ability to navigate the system. Under the need domain, Gelberg et al. (2000) included factors such as perceptions of health and conditions that are of special consideration to vulnerable populations, and the evaluation of such needs by health care providers. All the factors examined under the predisposing, enabling and need characteristics play significant role in health behaviors and subsequent outcomes.

Some researchers have found the behavioral model for vulnerable populations to be useful in explaining health utilization among vulnerable group (Baker, Bazargan, Barzargan-Hejazi, & Calderon, 2005; Hogan et al., 2012; Owosu et al., 2005; Stein, Anderson, Robertson, & Gelberg, 2012). The model offers the advantage of traditional and nontraditional domains to explain health utilization among vulnerable groups and the subsequent health outcomes. Using the expanded model as a framework, Fernandez and Morales (2010) found that predisposing factors such as demographic differences and enabling factors such as low income, usual source of health provider, and health insurance have significant association with utilization of screening services among Hispanic women. However, the researchers did not find any significant association between utilization of cervical cancer screening services and need factors such as self-rated health status.

Baker et al. (2005) found the model appropriate in understanding the determinants of timely utilization of vision care among a predominantly minority group living in housing communities in Los Angeles County, California. Using data from the Services

Access in Urban Public Housing study (SAUPH), the researchers found a strong association between utilization outcomes and having a regular source of care and health insurance coverage. The results from the study by Baker et al. were supported by Small (2010) who found a significant association between having a regular source of care and utilization of mental health services among people with co-occurring disorders and mental health disorders. Hoerster, Beddawi, Peddecord, and Ayala (2010) found age, marital status, ethnicity, birthplace, time in the United States, years of education, English literacy, transportation to work, income, and health insurance status as predisposing and enabling factors associated with health care utilization among California farm workers. In another study, Kagotho and Jan (2008) found that region of origin, access to medical care, education and visa adjustment status were significantly associated with prostate cancer screening among older immigrant men.

Methodologies Used in Previous Studies

Most of the studies that were included in this review were quantitative in nature with very few of them using the qualitative design. Participants were recruited into some of the studies using snowball sampling (Tung et al., 2008), convenience sampling (Ross et al., 2008; Xu, Ross, Ryan, & Wang, 2005), and multistage clustered sampling (Tsui, Saraiya, Thompson, & Richardson, 2007). Xu et al. used the snowball sampling and convenience sampling to study cancer risk factors among Southeast Asian American residents. The researchers, however, noted that the use of these sampling methods limited the generalization of the study findings to other Southeast Asian Americans.

Data were collected from some of the studies using self-administered questionnaires (Gamarra, Paz, & Griep, 2009; Ogunbowale & Lawoyin, 2008; Tung et al., 2008); analysis of existing databases (Lofters et al., 2010; Lee, Ju, Vang, & Lundquist, 2010; Sanz-Barbero et al., 2010; Tsui et al., 2007; Woltman & Newbold, 2007), review of existing literature (Ackerson & Gretebeck, 2007; Anorlu, 2008; Lee & Vang, 2010), and face to face or focus group interviews (Guifoyle et al., 2007; Howard et al., 2009; Juon et al., 2003). The use of existing databases may provide information on ethnic minorities such as immigrant women living in Africa.

By analyzing existing databases, researchers have found that they can reach a large sample of the immigrant population. By combining three years of data from the California Health Interview Surveys, H. Lee et al. (2010) were able to obtain a large sample size for their study on subgroups of Asian American women. Lofters et al. (2010) accessed several linked databases for their study and were able to conduct a large population-based study with broad inclusion criteria. While the use of self-administered questionnaire may lead to measurement error (Lee, Fogg, & Menon, 2008) because of over reporting or recall bias, Ross et al. (2008) pointed out that over-reporting may not be more common among one racial group than among another. Turniel-Berharlter, Finney, and Jaen (2004) found that there is a high level of agreement between self-report and actual receipt of Pap smear across several ethnic groups.

Data for some of the studies were analyzed using logistic regression to show the relationships between the variables that were studied (Gamarra et al., 2009; Howell et al., 2009; Lofters et al., 2010; Owosu et al., 2005; Woltman & Newbold, 2007). Logistic

regression testing is useful in identifying variables that are strong predictors of regular screening behaviors (H. Lee et al., 2010). In this study, I accessed an existing database to answer the research questions and conduct statistical analysis with the chi-square and logistic regression.

Literature Review Related to Key Concepts

General Information on Cervical Cancer

Cervical cancer is a slow-growing cancer that begins in the cervix of women and occurs mostly in women over the age of 30 years (CDC, 2012). The cervix is the lower end of the uterus that connects the vagina to the womb. As normal cells in the cervix grow, there may be abnormal growth when old and damaged cells do not die as they should (CDC, 2012). The damaged cells may form a mass of tissue growth which may be benign or malignant. While benign growths do not usually constitute health threats and do not invade surrounding tissues, malignant growth can become cancerous (National Cancer Institute, 2008; National Institute of Health, 2008). Once the cancerous cells begin to grow, they can slowly invade the whole body to cause devastating effects on health. Although cervical cancer is highly preventable and treatable if found early, a lot of women still develop the cancer with grave outcomes.

Victims of cervical cancer may not experience any symptoms in the early stages. However, as the cancerous cells begin to metastasize in the body, several signs and symptoms may be evident. These include abnormal vaginal bleeding such as bleeding between regular menstrual periods, bleeding after intercourse, heavier and longer menstrual periods, or bleeding after menopause (National Institute of Health, 2008).

Other signs may be increased or foul smelling vaginal discharge, pelvic pain and pain during intercourse (National Institute of Health).

Factors Contributing to Cervical Cancer

Human Papillomavirus (HPV) has been found to be the causative agent for cervical cancer (Denny-Smith et al., 2006). This virus is the most commonly transmitted sexual infection and may be transmitted through vaginal or anal sex. With more than 40 types, HPV may infect the genitalia and may contribute to several diseases including cervical cancer. According to the CDC (2011b), at least 50% of all sexually active persons will have HPV once in their lifetime. There are no symptoms associated with the virus and it usually goes away on its own without any infection. However, the virus may persist in some people to cause abnormal cell changes that can lead to cervical cancer (CDC, 2011b).

Other risk factors for cervical cancer include smoking, having more than three to four children, weakened immune system, long-term use of birth control pills, exposure to diethylstilbestrol before birth, high risk sexual behaviors, and co-infection with HIV (National Cancer Institute, 2008; Munoz, Castellsagne, Gonzalez, & Gissman, 2006). In addition, intimate partner violence which may cause a woman to be engaged in sexual activities against her will, may increase the risk of cervical cancer (Coker, Hopenhayn, DeSimone, Bush, & Crofford, 2009). In a study of 4732 participants, the researchers found that violence against women was significantly associated with increased prevalence of invasive cervical cancer (adjusted OR = 2.6, 95% CI = 1.7-3.9).

A lot of progress has been made in preventing the scourge of HPV and in preventing cervical cancer. In developed countries such as the United States, there has been a systematic decrease of about 50% in new cases in the last 3 decades (National Cancer Institute [NCI], 2011). According to the Institute, several measures are effective in preventing HPV infection. These measures include abstinence from sexual activity, use of protective barrier contraception during sexual activity, and vaccination against HPV 16 and HPV 18 – the strain of the virus that is commonly implicated in cervical cancer. Recommendations in preventing cervical cancer include getting regular gynecologic and cytological screenings. Yearly cervical cancer screening should begin three years after the initiation of vaginal intercourse and no later than 21 years. (American Cancer Society, 2012). Other cancer screening guidelines include:

- Screening every two to three years for women aged 30 years and older who have had three normal Pap tests. In addition to cervical cytology, such women should also have an HPV DNA test;
- Women aged 70 years and older who have had three or more normal Pap tests and no abnormal Pap test results in the previous 10 years may stop having cervical cancer screening;
- Women who have had a total hysterectomy with the removal of the uterus and cervix may stop having cervical cancer screening except when the surgery was done as a treatment for cervical cancer or precancer;
- Women who have had a hysterectomy without the removal of the cervix should continue to have regular Pap tests (American Cancer Society,

2011; Smith, Cokkinides, & Brawley 2008; The U.S. Preventive Task Force, 2011).

Cervical Cancer in Africa

Cervical cancer has remained a major concern in Africa. The rates of the cancer can be as high as 15 times above those of industrialized countries (Anorlu, 2008; Becker-Dreps et al., 2010). Denny (2006) reported that between 1993-1995, the age standardized incidences of cervical cancer for all women was 22/100,000 while it was 27/100,000 for African women and that the lifetime risk of developing cervical cancer was 1 in 34 for African women while it was 1 in 93 for White women. In 2008, the incidence and mortality of cancer of the cervix in Africa ranged from 26.8 to 34.5 and 14.8 to 25.3 respectively (Jemal et al., 2011). The incidence and mortality among more developed countries ranged from 4.5 to 6.9 and 2.1 to 2.5 respectively (Jemal et al., 2011). Table 1 provides a breakdown of the incidence of cervical cancer in Africa compared to the world, as well as developed and developing countries.

Table 1

Incidence of Cervical Cancer Globally, Developed and Developing Regions, and Africa

Region/Country	Crude Rate	No of Cases	Ranking of all women	Ranking women 15-44 years
World	15.8	529828	3 rd	2 nd
Developed Regions	12.1	76507	10 th	3 rd
Developing Regions	16.7	453321	2 nd	2 nd
Africa	16.2	80419	2 nd	2 nd

Data from WHO/ICO (2010)

The high incidence of cervical cancer in Africa has been attributed to several factors including socioeconomic, biological, awareness and knowledge, and lack of access to screening (Anorlu, 2008). The problems highlighted by Anorlu occurs in several regions and countries in Africa. Researchers have found that African women that live in Nigeria do not follow the recommended screening guidelines for diverse reasons. Aniebue and Aniebue (2010) found that only 58.5% of female undergraduates in a Nigerian University were aware of screening guidelines. Another study by Ogunbowale and Lawoyin (2008) showed that 95% of 278 women that participated in a study had never heard of cervical cancer screening, only 52.8% reported willingness to be screened, and 12.6% of participants would not submit to cervical cancer screening even if it was offered free of charge.

Some researchers have found that barriers to cancer screening among African women include lack of awareness of screening guidelines, lack of information on where and how to receive screening, and beliefs about the diagnosis of cancer (Becker-Dreps et al., 2010; Nnodu et al., 2010). A cross-sectional study of 140 college women in Ghana by Abotchie and Shokar (2009) found that the rate of Pap screening among participants was 12%. In Kenya, while 100% of the 147 women enrolled in a study admitted to having heard of availability of screening services cervical cancer, only 1% had ever been screened for cervical cancer and 2% were aware of the availability of screening facilities at the health center they use (Becker-Dreps et al.).

The findings by Becker-Dreps et al. (2010) were supported by Anorlu (2008) who found that less than 1% of women in four West African countries have ever been screened for cervical cancer. Barriers found to inhibit screening included belief that the screening would take away virginity, belief that the test was painful, and lack of belief that cervical cancer can be diagnosed through screening (Abotchie & Shokar, 2009). Other documented barriers to effective treatment of abnormal cancerous growth include lack of equipment in the African region. Bradley et al. (2006) conducted a study of five African countries and noted that only 46% of provincial hospitals had the basic equipment needed to perform cervical cancer surgery. Even when the equipment is available, there are still barriers to its utilization.

In their study, Denny (2008) reported that though South Africa has some of the most sophisticated screening equipment, rural women in the country may not have access to screening services because of the country's discriminatory health care practices. Given

the documentation of cervical cancer screening barriers and challenges experienced by women living in Africa, women who immigrate to the United States from Africa may face similar challenges as those in Africa. These women may not be experiencing the benefits of the great strides made in decreasing cervical cancer incidence and mortality through screening. A study conducted in Spain by Sanz-Barbero et al. (2011) found that immigrant women including those from Africa were less likely to receive cervical cancer screening than their Spanish counterparts.

Statistics on African Immigrants in the U.S.

African immigrants represent a growing population in the United States. Data from the Department of Homeland Security reveals that there has been a steady increase in the number of immigrants from Africa. In 1995, 42,456 Africans immigrated to the United States (Department of Homeland Security, n.d). This number grew by 41.9% to 60,269 in 2002 (Department of Homeland Security, n.d(b). More than half of these immigrants were women (Department of Homeland Security, n.d). The prevailing situation on the immigration status of the African women highlights the need for better understanding of the health status of the population and their access to health care services (Tsui, et al., 2007).

Table 2

Persons Immigrating from Africa to the United States under Different Status

Immigrant Group	2000	2005	2010	2011
Permanent Resident Status				
Total	841,002	1,122,373	1,042,625	1,062,040
Africans	40,790	79,701	98,246	97,429
Percentage of Total	4.85%	7.10%	9.42%	9.17%
Asylees				
Total	No data	13,487	11,187	13,484
Africans		2,673	2,633	3,055
Percentage of Total		19.8%	23.5%	22.65%
Naturalized Persons				
Total	886,026	604,280	619,913	694,193
Africans	25,792	38,830	64,022	69,738
Percentage of Total	2.91%	6.42%	10.32%	10.04%
Refugees				
Total	72,143	53,738	73,293	56,384
Africans	17,624	20,746	13,325	7,693
Percent of Total	24.42%	38.6%	18.18%	13.64%
Non-Immigrants				
Total	No data	32,003,435	46,471,516	No data
Africans		395,734	485,116	
Percent of Total		1.23%	1.04%	

Source: Department of Homeland Security.

As Table 2 depicts, Africans move to the United States under the following immigration statuses:

Permanent Legal Residents: Persons who have been granted authorization to live and work in the United States on a permanent basis.

Asylees: Persons who are seeking protection from their usual place of residence because they have suffered or fear that they will suffer persecution because of race, religion, nationality, membership in a social group, or political opinions. Such persons may be granted the legal right to live and work in the United States and may eventually apply for permanent legal residency.

Naturalized Person: Persons of foreign nationality who are granted rights to become citizens of the United States after fulfilling certain requirements established by Congress.

Refugees: Persons who have been displaced from their country of origin on the basis of war or persecution. Such persons may be living within or outside their country of origin and may be granted permission to live in the United States under special humanitarian concern.

Non-immigrants: Persons admitted to the United States on a temporary basis for a particular purpose. Such persons are legally restricted to the activity for which they were allowed entry.

Due to immigration to the United States, African women live in the community and their health status affects the overall health of the country. Interventions that are geared towards improving health outcome should include those that are targeted at this group and other marginalized and disadvantaged groups. While evidence abounds that there have been increased strides in improving adherence to cervical cancer screening in

the United States, disparities still exist in screening based on place of birth, race, ethnicity, socioeconomic status, and access to health care services.

Disparities in Screening Practices

Some studies have documented disparities in cervical cancer rates. Such disparities may be because of race, ethnicity, socioeconomic factors, place of birth, immigration status, or access to health care and screening services (Akers et al., 2007; Down, Smith, Scarinci, Flowers, & Groesbeck, 2008; Ross et al., 2008; Tsui et al., 2007). Chu, Miller, and Springfield (2007) measured cancer burden rates and ratio between 1995 to 2000 by examining trends in cancer rates for nine cancer sites including cervical cancer. The researchers found that there were increases in rates and ratio among lower socioeconomic groups. Blacks were found to have higher rates when compared to their White counterparts for each of the cancer sites except for female lung cancer. U. S Hispanics have higher cervical cancer rates than their White counterparts (Jemal, Center, DeSantis, & Ward, 2010).

Wong et al. (2011) found a higher rate of cervical cancer among American Indians/Alaskan Natives than their non-Hispanic White counterparts. Leman, Espey, and Cobb (2005) found cervical screening rates as high as five times that of the national average among American Indians and Alaskan Natives (AI/AN) in North and South Dakota. Day, Lanier, Bulkow, Kelly, and Murphy (2010), however, did not find any significant increase in cervical cancer rates of Alaska Native (AN) women and their U.S White women counterparts. The incidence rates for AN women from 1999 to 2003 was 6.4 per 100,000 and 5.8 per 100,000 for USW (Day et al., 2010).

Considerable heterogeneity exists among different subgroups on cervical cancer prevalence rates, stage at cancer diagnosis, mortality rates, and lifetime risk of dying from the cancer (Down et al., 2007). These researchers found that U.S. born minorities have comparable Pap screening rates to whites while foreign-born women have lower screening rates than their U.S. counterparts. The study further found that barriers to screening among Hispanic and Asian American women include low levels of acculturation, lack of English proficiency, foreign birth, discomfort at a doctor's touch, fear of finding cancer or other diseases, and embarrassment and pain. A study conducted among Asian Americans found that 56.9% of the participants were unaware of a free screening program for low-income women although these women qualified for the program (Xu et al., 2005).

A study by McCarthy et al. (2010) found that while cervical cancer incidence and mortality rates decreased from 1995 to 2006, Blacks and Hispanics had higher incidence and mortality of cervical cancer rates than their White counterparts. In a cross-sectional study among female post-graduate physicians, Ross et al. (2008) found that racial and ethnic differences may contribute to adherence to cervical cancer screening recommendations. In the study, women who self-identified as Asians were less adherent to cervical cancer screening than those who self-identified as Whites. Additionally, women who self-identified as East Indians were less likely to accurately perceive adherence or non-adherence. However, the study did not find any significant difference in adherence between women who self-identified as Hispanic/Latina and African Americans and their White counterparts.

In a study of 1170 women enrolled in a safety-net system, Owosu et al. (2005) found that Hispanic and African American women were less likely to have had a Pap smear than non-Hispanic white women. Furthermore, these researchers found that age and marital status may predispose women to screening as older women and married women were less likely to have Pap smear screening. Lee, Vang, and Lundquist (2010), however, found that married women were more likely to have positive cancer screening behaviors than their unmarried counterparts. While several studies have reported low screening for immigrants, researchers found that Hispanic immigrants were more likely to have had a Pap smear within the previous three years than Hispanic Americans. In addition, some immigrants may not understand the importance of screening for cervical cancer if annual exams and screenings are not the norms in the countries of origin (Owosu et al., 2005).

In an integrated literature review of seventeen articles, Ackerson and Gretebeck (2007) noted that cervical cancer screening practices among African American and Hispanic women were influenced by lack of insurance, no usual source of health care, acculturation, socioeconomic factors, perceptions of vulnerability, and perceptions of the association of high-risk sexual behavior with Pap smear. These findings were supported by Lee, H., et al. (2010) who found that enabling factors for cancer screening include private health insurance and usual source of care. Juon et al. (2003) also found a positive association between health insurance and regular Pap Smear screening among Korean-American women.

Foreign Birth

With an estimated 37.6 million foreign-born persons living in the United States in 2010 (U.S Census Bureau, 2010), the overall health of the country is impacted by the health status of this group. While native-born U.S. citizens may have embraced the measures that have been found effective in reducing the burden of cervical cancer, immigrant and foreign-born women continue to have barriers that hinder the use of these measures. Tsui et al. (2007) noted significant differences in cancer screening rates based on foreign birth and years of duration in the country. These researchers found differences as high as 25-40% in screening rates between some foreign born groups and their U.S counterparts. High differences were also found based on lifetime years that have been spent in the country.

These findings echo similar studies that have been done in other developed countries. According to Woltman and Newbold (2007), immigrant women in Canada were less likely to be screened for chronic diseases than their native-born counterparts. This finding was echoed by McDonald and Kennedy (2007) who found that native-born Canadian women were more likely to be screened for cervical cancer than Canadian immigrants. Unlike other studies however, Woltman and Newbold found that some recent immigrants were more likely to have ever had a Pap test when compared to their long-term immigrant counterparts. This may be attributed to the fact that the researchers found that recent immigrants were more highly educated and more likely to have access to regular healthcare providers than long-term immigrants. In this study, recent immigration was defined as less than 15 years while long-term immigration was defined

as more than 15 years. In a similar study in Canada, Lofters et al. (2010) found the lowest screening rates among immigrant women from South Asia, Middle East, and North Africa. This finding was similar to results from Sanz-Barbero et al. (2011) who noted that immigrant women in Spain were less likely to use cervical cancer screening services than native-born Spanish women.

However, Amankah, Ngwakongnwi and Quan (2009) found that recent immigrants women among visible minority groups in Canada and those who do not have a usual source of care may be more likely to have never had a Pap test. The findings from this study suggest that the two major reasons for the non-screening behavior were the belief that the test was not necessary and not having gotten round to doing the test. The researchers noted that most of the recently immigrated visible minority women work more than one job to provide for their families and may not have the time to visit health care providers. In addition, their cultural beliefs and practices may hinder them from engaging in screening practices.

Cervical cancer screening rates have been found to be lower among immigrant women when compared to their U.S. born counterparts (Akers et al., 2007). In a review of 95 articles, these researchers noted that immigrant women were less likely to undergo cervical cancer screening, more likely to be diagnosed at later disease stages, and more likely to have higher death rates from cervical cancer. Some of the reasons that the authors found for this were lack of access to health care due to lack of health insurance or lack of usual health care provider, cultural beliefs such as non-western orientation towards health prevention, fatalistic health beliefs, cultural perception of modesty, and

low degree of acculturation which may be due to length of immigrant status or lack of English fluency.

While there may be disparities in screening rates, Beiki, Allebeck, Nordqvist and Moradi (2009) found significantly lower risk of cervical cancer among immigrant women from Africa, Finland, Iran, Iraq, Turkey and South-Europe when compared with their counterparts that were born in Sweden. The risk, however, increased with age at migration. Among these groups, women who migrated before the age of 35 were found to have the lowest risk (Beiki et al., 2009). Howell et al. (2009) that age was associated with the stage of cervical cancer diagnosis. Cervical cancer incidence has been found to increase with age. Women over the age of 65 years account for 25% of cervical cancer cases and 40% of cervical cancer deaths (Akers et al, 2007).

In their study, Akers et al, (2007) found racial disparities in cervical cancer screening practices. While young Black women have comparable cervical cancer screening rates as their White counterparts, older Black women have lesser screening rates than their White counterparts (Akers et al., 2007). These lower screening rates may account for late diagnosis of cervical cancer among Black women and higher mortality rates among the group. The findings from these studies highlight the importance of investigating how some of the factors identified in literature affect the cervical cancer screening practices of women from continental Africa who are living in the United States.

Level of Education, English Language Proficiency, and Cultural Factors

Women who have high a school diploma or higher certificates may be more likely to have annual Pap testing. Jennings-Dozier and Lawrence (2000) found that Black and

Hispanic women who have health insurance, are high school graduates, and have higher income were more likely to be adherent to annual Pap testing than their counterparts with lower level of literacy. The association between education level and cervical cancer screening was also explored among Hmong Americans who have low literacy and low English proficiency (Lee & Vang, 2010). In addition to the low literacy and low English proficiency, barriers to cancer screening among this group include access to healthcare, race of healthcare provider, health insurance, years in the United States and beliefs about the etiology of illness (Lee & Vang, 2010). Akers et al. (2007) also found a significant correlation between low health literacy and low knowledge about the disease, reduced health screening behaviors, delays in disease diagnosis, and poor health outcomes. Lee, Nguyen and Tsui (2011) operationalized language of interview as a measure of acculturation. These researchers found that participants in their study who interviewed in an Asian language were less likely to receive cervical cancer screening than their counterparts who interviewed in English language.

Foreign-born women from continental Africa may be experiencing the effect of educational status on cervical cancer screening. In the study by Sanz-Barbero et al. (2011), immigrant women from Africa had the lowest educational status when compared with their counterparts from Spain, United States, Canada, Eastern Europe, and Asia. Cultural factors may play a role in health practices of immigrant women and contribute to higher cervical cancer rates (Juon, Kim, & Shankar, 2004; Lee & Vang, 2010). Cultural factors, such as modesty, fatalistic views, and preference for native health practices as first form of treatment, may contribute to higher cancer rates among Asian Americans (H,

Juon, 2003). In the same vein, Hmong Americans belief about the etiology of illness, the attachment of serious illnesses to spiritual causes and their fatalistic attitude towards spirit-rooted illnesses may hinder them from positive health behaviors (Lee & Vang, 2010). Chinese women with strong cultural and traditional views were less likely to adhere to screening guidelines (Ji, Chen, Sun, & Liang, 2010). It was further noted that the level of proficiency in English was a predictor of participants' acceptance of the Pap screening test. However, the level of education and acceptance of the screening test was found to be non-significant after being mediated by cultural views.

A qualitative study by Howard et al. (2009) among several cultural groups did not find culture to be a strong barrier to the use of self-sampling for HPV. The study sampled native-born Canadians, and Arabic, Cantonese, Chinese, Somali, Afghans and Hispanic-speaking immigrants. The study found that only the Chinese-speaking groups expressed barriers to HPV self-sampling because of cultural reasons.

Interventions to Reduce the Burden of Cervical Cancer

The current review of literature identified several interventions and mode of delivery that have been found effective in reducing the burden of cervical cancer. Evidence from the literature reveals that vaccination against the HPV virus and improved adherence to screening have been found to be effective in preventing cervical cancer and in preventing progression to invasive cancer when there are abnormal changes. Chu et al. (2007) suggest that the decline in the cervical cancer rate in the United States may be due to greater utilization of Pap screening and subsequent timely treatment for abnormal cancerous growth in the cervix. Studies have been done to determine the effectiveness of

several interventions to reduce the burden of cervical cancer. Some of the interventions have been focused on increasing awareness of cervical cancer and HPV and on the method of delivery of the intervention. Maree and Wright (2011) found that the way the information about cervical cancer is presented has great impact on screening. The study, which was done among South African women, found that when cervical cancer is presented as a sexually transmitted disease caused by promiscuous behaviors, women are more likely to feel stigmatized and thus develop avoidance behavior towards screening.

A print intervention that was developed with input from Korean American women and disseminated through a community clinic was found to be encouraging in improving adherence to repeat cervical cancer screenings among women with initial positive HPV results (Waller, McCaffery, Nazroo, & Wardle, 2005). The researchers found that associating cervical cancer with sexually transmitted disease may produce responses such as stigma, blame, or problems with disclosure. Contrary to other studies, Gerend and Sheperd (2007) found that women who were exposed to loss-framed messages were more likely to have positive intentions towards HPV vaccination than women who were exposed to gain-framed messages. Women who have tested positive for HPV and need to have a second test must have their information needs met so that they do not suffer on-going anxiety while waiting for the test (Waller, McCaffery, Kitchener, Nazroo, & Wardle, 2007).

The review of literature revealed that access to health care services may be associated with receipt of cervical cancer screening. Uninsured individuals reported more difficulties with accessing health care services than those with insurance (Kaplan &

Inguanzo, 2011). Such individuals may perceive their health status as poor (Kaplan & Inguanzo, 2011). Howell et al. (2009) found that uninsured and underinsured women had higher percentage of positive precancerous cells report than their insured counterparts. Ackerson and Gretebeck (2007) reported that lack of insurance status was associated with non-receipt of cervical cancer screening. Fatone and Jandorf (2009) did not, however, find any significant difference in cervical cancer screening practices of individuals with insurance and those without insurance. In a study conducted in Korea, individuals who reported poor health status were more likely to receive cancer screening services than those who reported that they had good health status (Cho, Guallar, Hsu, Shin, & Lee, 2009).

Summary

While African immigrants are an integral part of the American population, the literature has not shown any significant investigation into their awareness of cervical cancer screening guidelines and the factors that influence their screening behaviors and practice. This study proposes to fill that gap. Knowledge that is gained from this study will be beneficial in developing interventions tailored to meet the needs of a group that may be currently underserved. It is hoped that this knowledge and subsequent interventions will increase the study group's utilization of the sophisticated screening resources that are available in their country of residence.

In Chapter 3, I discuss the methodology that I used in conducting the study. Additionally, I present information on the population, the sample, the survey instrument, the data analysis protocol, and ethical considerations related to this study.

Chapter 3: Research Method

Introduction

In Chapter 2, I established that there is a paucity of information in literature on the awareness of this subpopulation to cervical screening guidelines and factors that influence their screening behaviors and practices. The purpose of this study was to investigate the factors that affect cervical cancer screening practices among continental African women living in the United States. In this chapter, I discuss the research design methods that I used to investigate the factors that influence cervical screening behaviors of immigrant women of African origin living in the United States of America. The topics that are explained in this chapter include the description of the population, sampling size, method and recruitment, the survey instrument, data collection process, data analysis, and ethical treatment of participants.

Research Design and Approach

The dependent variable is cervical cancer screening measured. The independent variables are age, educational status, insurance status, health status, family income and acculturation level. The data for this study were collected through a cross-sectional design in 2005, 2008, and 2010. I used the quantitative nonexperimental design to determine how the independent variables influence the cervical cancer screening practices of the study participants.

According to Creswell (2009), the quantitative design is useful in testing the relationship between variables and in testing hypothesis. A quantitative study allows the researcher to use findings from the sample participants to generalize to the target

population. With the nonexperimental survey, the researcher can make observations, describe or explain phenomena and draw conclusions through questionnaires without manipulating the variables (Singleton & Straits, 2005). The nonexperimental explanatory quantitative design allowed me to give descriptive information about the phenomenon, investigate several variables and their influence on the outcome variable, draw conclusions, and provide explanations for the attitudes and behaviors of the study population towards cervical cancer screening. Denny-Smith et al. (2006) used this type of study to assess the knowledge, beliefs, risk behaviors, and perceptions of risk of nursing students regarding HPV and cervical cancer.

Setting and Sample

The target population is continental African women aged 18 to 70 years who are living in the United States. According to the U.S Census Bureau (n.d), there was an estimated 666,600 women 18 years and older of African origin living in the United States from 2009 to 2011. The participants were African women of the stated age range who were respondents to the National Health Interview Survey in 2005, 2008, 2010. I limited the participants to this age group based on the 2002 American guidelines recommendations that women should start cervical cancer screening at 21 years or no later than three years after becoming sexually active and that they may stop screening when they attain the age of 70 years (American Cancer Society, 2011). Based on these recommendations, women were advised to start Pap smear screening from 18 years of age (Smith, Cokkides, & Brawley, 2009).

Participants were enrolled in the study based on the sampling design that is used by the NHIS in the primary survey. This design was based on the stratified multistage sample method that is used to produce estimates for the entire population. One unique feature of the NHIS sample is that the sampling method is redesigned every 10 years to better reflect the changing population in the country. Each year, the sample that is chosen is assigned to each of the four census regions and four calendar quarters. The sample within each quarter is further assigned to individual weeks. Thus, data are collected all year round on the chosen sample. The subsample of interest in this study is female respondents who are of African origin. The decision to focus on this population group was necessitated by the paucity of information on the predictors of cervical cancer among the group and to contribute to the body of literature on how best to develop interventions that will be targeted to the group on cervical cancer screening.

Sample Size

In their study, Suresh and Chandrashekara (2012) argued that the purpose of performing a sample size assessment is to identify the optimal sample requirements that identify the true effect of the phenomenon in the population. Suresh and Chandrashekara determined that a sample size assessment is a critical process in the design of a planned research procedure. Kadam and Bhalerao (2010) argued that for descriptive studies, researchers need hundreds of subjects to give a sensible confidence interval with small effect. The purpose of using a large power for any research is to make identification of the phenomenon more probable and thus requires a large sample size.

In this study, the goal was to explore the estimate of effect when analyzing the differences between women who have regular Pap smear test and those who do not have regular Pap smear test, with a 5% margin of error (MOE), a 95% confidence interval, and an alpha level of .05. To determine the adequate sample size, the formula used was $N = \frac{p(1-p)(z_{\alpha/2}/E)^2}{}$ where n = sample size, z_{α} = standardized scores for the confidence interval (e.g. 1.96 for 95% CI), p = proportion formulated as decimal (e.g., .5), and E = MOE (e.g. $\pm 5\%$), which estimated a sample of $n = 384$ participants. Suresh and Chandrashekara (2012) argued that in social science, statistical power positively correlates with the sample size, and that a power level of .80 was ideal for correlational studies. There were 614,322 women aged 18 to 70 years who were born in Africa but were living in the United States from 2009 to 2011 (U.S Census Bureau, n.d). To obtain an adequate sample for this population, I utilized a minimum sample size of $N = 384$ observations in this study to obtain a minimum statistical power level of .80 and a true estimate of effect size. The population that was sampled for the years 2005, 2008, and 2010 were 572. This number provided an adequate sample for the study.

Data Collection Methods

The NHIS data are gathered through confidential personal interviews that are collected from a representative sample of the population. Each year, between 35,000 to 40,000 households are chosen and data are collected from 75,000 to 100,000 individuals. A selected sample cannot be replaced by another one. One civilian adult family member is then randomly selected from the household and the family member self-reports to the questions from the sample adult questionnaire. Interviewers who collect the information

are part-time employees of the U.S census bureau and they receive extensive training on basic interview procedures and the interviews are conducted in person in the homes of the selected samples.

The questionnaires are administered through the Computer Assisted Personal Interviewing (CAPI). By using the CAPI, the computer guides the interviewers through the data collection process, and allows for routing and branching to appropriate questions based on the responses. The interviewer enters the responses directly into the computer during the interview. An advantage of the CAPI is that the computer is able to determine if the response is within the allowable range and consistent with other responses that have been given during the interview. According to Kissinger et al. (2010), some of the advantages of the CAPI over paper surveys include more complete interviews because of the possibility of checking the error range, reduction in cost due to elimination of printing and mailing cost, data transcription error, and improved data storage.

The survey has two main parts that are the core questions and the supplemental section. The core questions are series of questions that have been developed, standardized, and tested over time. In the core component, respondents answer questions on demographic information, health status and limitations, injuries, healthcare access and utilization, health insurance, and income and assets. These questions have remained the same over the years. The supplemental sections may change from year to year as data may be collected on pertinent current issues of national importance (National Center for Health Statistics, 2012). The core questionnaires are revised every 10-15 years with the last revision in 1997. The supplemental section of the survey that is used in this study

was collected in 2005, 2008, and 2010. I have limited the study to the stated years because they are the most recent years during which female respondents were asked about their cervical cancer screening status.

Instrumentation and Materials

The data for the study were accessed through the Integrated Health Interview Series (IHIS), which is a public data repository for the National Health Interview Survey and managed by the Minnesota Population Center at the University of Minnesota. Researchers have found that the harmonization of the NHIS data into a web-based system through the IHIS is useful in making consistent comparison and analysis of health issues across four decades (Davern, Blewett, Lee, Boudreau, & King, 2012; Johnson, Blewett, Ruggles, Davern, & King, 2008). The NHIS is a survey that has been used to gather information on the health status of the non-institutionalized people in the United States of America since 1957. The survey gathers annual information on the demographics, health status, health behaviors, health care access and utilization of health care services by participants (National Center for Health Statistics, 2012). The information that is provided in this survey can be useful in assessing how the country is moving towards the Healthy People program goal of improving the health of all Americans.

The instrument that was used to measure the variables that are the focus of this study are described below. The outcome variable was assessed by asking the respondent if she had ever had a pap test. Other variables are the region of birth, years spent in the United States, language of interview, highest level of education completed, self report of health status, health insurance status and age of respondents.

Reliability and Validity

Reliability of a measuring instrument refers to its ability to consistently assess the same thing over time while validity refers to the extent to which it measures what was intended (Demiris, 2006). This study benefitted from the advantages inherent in an established database such as the NHIS. The data for the study were gathered from the sample by volunteers, who receive extensive training before they are sent out to the field. The questionnaires that were used by the volunteers have been pretested and standardized over several years. The standardization provides the advantage of asking the same questions from all recipients. This improves the reliability of this design.

The retrospective nature of this study may make it prone to recall bias. Rausher, Johnson, Cho, and Walk (2008) found that the self-report of Pap smear screening of the NHIS estimates may not be accurate with sensitivity at 0.93 and specificity at 0.61. Caplan et al. (2003), however, found a fairly accurate reporting and agreement between medical records and self-report of Pap smear test. The multistate, stratification, and clustering design of the sampling method may lead to misleading results if the standard statistical analysis methods are used (CDC, 2011). For this reason, the CDC advises the user of data to use weighted data.

The Variables

Dependent Variable

The outcome variable in this study is cervical cancer screening. The American Cancer Society (2012) recommended that cervical cancer screening should begin at age 21 and women between the ages of 21 and 29 should have a Pap test every 3 years. The

previous recommendations encouraged women to start Pap test screening at the age of 18 years (Smith et al., 2009). Women between ages 30 and 65 years should have a Pap test and an HPV test every 5 years and those over 65 years of age who have had normal results should not be screened for cervical cancer (American Cancer Society). This also applies to women who have had hysterectomy and who do not have history of cervical cancer or precancer.

Independent Variables

The independent variables for this study were assessed based on the predisposing, enabling, and needs domain. Under the predisposing domain, the age, level of education, socioeconomic status and family income were measured. Health insurance status and proficiency in the English Language were measured under the enabling domain while perceived health status was assessed under the need domain. Perceived health status was measured by the participants self-report of how healthy they think they were.

The independent variables measured in this study have been found to be predictors of cervical cancer screening uptake among some minority women such as Hispanics (McCarthy et al., 2010) and Asians (Ross et al., 2008) but not specifically among immigrant women from Africa living in the U.S. Lee, Fogg, and Menon (2008) studied the effect of age, income level, education status, English Language proficiency, and having regular source of care among Korean American women. Fernandez and Morales (2007) found that socioeconomic barriers characteristics influence cervical cancer screening behaviors among Hispanic Texas women. Owosu et al. (2005) noted that race, ethnicity, immigration status, usual source of care, personal/family resources,

and health status could predict Pap smear screening ever and Pap smear screening within the recommended time frame among minority and immigrant women. Corbie-Smith, Flagg, Doyle, and O'Brien (2002) examined the influence on usual source of care on the receipt of preventive services among several multicultural groups. Other studies have examined the impact of English Language proficiency on Pap smear screening among minority groups (Alba, Sweningson, Chandy, & Hubell, 2004; DuBard & Gizlice, 2008).

Data Analysis Plan

The data collected were analyzed using SPSS version 21 and all statistical tests were conducted using an alpha level of ($\alpha = .05$) for statistical significance. The decision to reject the null hypothesis is that if the p -value is less than or equal to the stated alpha level, reject the null hypothesis and accept the alternative hypothesis. If the p -value is greater than the stated alpha level, I retained the null hypothesis and reject the alternative hypothesis. I interpreted all confidence intervals and effect size to avoid a type one error and the strength of the relationship between the independent and dependent variables.

RQ1: Are socioeconomic factors, measured by family income and education level, associated with cervical cancer screening status among African women living in the United States.

H_0 1: There is no association between socioeconomic factors, measured by family income and education level, and cervical cancer screening status among African women living in the United States.

H_a1 : There is an association between socioeconomic factors, measured by family income and education level and cervical cancer screenings status among African women living in the United States.

Statistical Analysis: I used the Chi-Square test of independence and logistic regression to test for association between socio-economic factors and cervical cancer screening status. I then conducted logistic regression to determine the significance of the result and reject or retain the null hypothesis based on the alpha level.

RQ2: Is insurance status associated with cervical cancer screening status among African women living in the United States.

H_02 : There is no association between insurance status and cervical cancer screening status among African women living in the United States.

H_a2 : There is an association between insurance status and cervical cancer screening status among African women living in the United States.

Statistical Analysis

I used the Chi-Square test of independence to test for association between access to health and cervical cancer screening status. I determined the significance of the result and rejected or retained the null hypothesis based on the alpha level.

RQ3: Is acculturation, measured by language of interview, associated with cervical cancer screening status among African women living in the United States.

H_03 : There is no association between acculturation, measured by language of interview, and cervical cancer screening status among African women living in the United States.

H_{a3} : There is an association between acculturation, measured by language of interview, and cervical cancer screening status among African women living in the United States.

Statistical Analysis

I used the Chi-Square test of independence to test for association between acculturation and cervical cancer screening status. I determined the significance of the result and rejected or retained the null hypothesis based on the alpha level.

RQ4: Is there a relationship between the age of participants and cervical cancer screening behavior among African women living in the United States?

H_{04} : There is no relationship between age group and cervical cancer screening status among African women living in the United States.

H_{a4} : There is a relationship between age group and cervical cancer screening status among Africa women living in the United States.

Statistical Analysis: I conducted a Chi-Square test of independence between age group and cervical screening practice among participants. I determined the significance of the result and rejected or retained the null hypothesis based on the alpha level of 0.05.

RQ5: Is perceived health status associated with cervical cancer screening status among African women living in the United States?

H_{05} : There is no association between perceived health status and cervical cancer screening status among African women living in the United States.

H_{a5} : There is an association between perceived health status and cervical cancer screening status among African women living in the United States.

Statistical Analysis: I used the Chi-Square test of independence to test for association between perceived health status and cervical cancer screening practices. I determined the significance of the result and rejected or retained the null hypothesis based on the alpha level of 0.05.

I present the information on the data analysis by using descriptive and inferential statistics such as frequencies and percentages. The chi-square was used to test and report the cancer screening behaviors of participants. The dependent variable was assessed on a dichotomous scale to determine if participants have ever or never had cervical cancer screening. The independent variables of insurance status, health status, acculturation and socioeconomic status will be assessed on the dichotomous scale. This dependent variable was assessed at the nominal level to determine if the participants have ever had Pap smear screening. The chi-square test is an appropriate choice for this variable because the measures are categorical and independent of each other (Munro, 2005).

Logistic regression allows researchers to test the association between a dichotomous, categorical outcome variable and multiple independent variables (Munro, 2005; Tabachnick and Fidell, 2007). This model of analysis has been used to measure several factors that influence cervical cancer screening among minority women (Blackwell, Martinez, & Gentleman, 2008; Goel et al., 2003; Ji et al., 2010; McDonald & Kennedy, 2007; Woltman & Newbold, 2007).

Threats to Validity

The secondary data used in this study is one of the shortcomings of this research. Secondary data limits the researcher to what already exists and does not give room for specifying the exact measures that could be investigated (Smith et. al, 2010). For example, I would have liked to investigate the differences that exist in cervical cancer screening among women from different regions of Africa. However, data is only available for African women as a whole.

In addition, this study may be subject to recall bias because of its cross-sectional nature as participants are asked to disclose their participation in cervical cancer screening and the length of time since that screening. Participants may have been tempted to give socially-acceptable answers to some of the questions. Several researchers have shown that participants may not accurately report their receipt of Pap test or may give socially acceptable answers (Blackwell et al., 2008; Bowman, Sanson-Fisher, and Redman, 1997). Women may over-report their last Pap test as having occurred more recently than when it actually occurred (Bowman et al., 1997). Another limitation is that when compared to telephone or self-administered surveys, there may be reduced self-report accuracy with face-to-face interviews (Vernon et al., 2008).

However, some researchers have found a level of high accuracy among self-report of receipt of Pap tests among low-income populations. Turniel-Berharlter et al. (2004) investigated the accuracy of self-report of mammography by reviewing medical records. The researchers found a high level of agreement between self-report and actual receipt of Pap smear screening across several racial and ethnic groups. In another study, Paskett,

Tatum, Mack, Hoen, Case, and Velez (1996) found 79% accuracy between self-report of Pap test among low-income minority women. The study, however, notes that women may not be reporting Pap tests accurately because the process of receiving the test is similar to receiving a pelvic examination.

Ethical Considerations

I used several methods to uphold ethical consideration in this study. As a first step in upholding ethical consideration, I applied and received approval to conduct the study from Walden University Institutional Review Board (IRB). I did not have access to the data that was used in the study until after I received the approval. The information about the respondents in this study is not part of the public access file and I did not seek access to this private information. Thus the respondents will remain anonymous. A major ethical consideration is the handling of the data so that its integrity is maintained. I have not tampered with the original data by falsifying, altering, or modifying it in any way.

Summary

In this chapter, I have explained the procedures that were used to collect data to provide answers to the research questions. I have provided a brief description of the study design, the sample frame, the sampling methods, the study instrument, the procedures for the analysis of the data, some limitations of the methodology, and the ethical considerations. In the next chapter, I discuss the actual data collection and the findings from this study.

Chapter 4: Results

Introduction

The purpose of this quantitative, cross-sectional study was to investigate factors affecting cervical cancer screening status among women of African origin living in the United States. I conducted my research using secondary data from the 2005, 2008, and 2010 National Health Interview Surveys (Integrated Health Interview Series, 2012). In this study, according to the research questions and hypotheses listed, I investigated the association between cervical cancer screening and selected independent variables of family income, education level, insurance status, acculturation, age, and perceived health status.

Research Questions and Hypotheses

RQ1: Are socioeconomic factors, measured by family income and education level associated with cervical cancer screening status among African women living in the United States?

H_01 : There is no association between socioeconomic factors, measured by family income and education level, and cervical cancer screening status among African women living in the United States.

H_a1 : There is an association between socioeconomic factors, measured by family income and education level, and cervical cancer screening status among African women living in the United States.

RQ2: Is insurance status associated with cervical cancer screening status among African women living in the United States?

H_02 : There is no association between insurance status and cervical cancer screening status among African women living in the United States.

H_a2 : There is an association between insurance status and cervical cancer screening status among African women living in the United States.

RQ3: Is acculturation, measured by language of interview, associated with cervical cancer screening status among African women living in the United States?

H_03 : There is no association between acculturation, measured by language of interview, and cervical cancer screening status among African women living in the United States.

H_a3 : There is an association between acculturation, measured by language of interview, and cervical cancer screening status among African women living in the United States.

RQ4: Is there a relationship between age and cervical cancer screening status among African women living in the United States?

H_04 : There is no relationship between age and cervical cancer screening status among African women living in the United States.

H_a4 : There is a relationship between age and cervical cancer screening status among African women living in the United States.

RQ5: Is participant's perception of health status associated with cervical cancer screening status among African women living in the United States?

H_05 : There is no association between perceived health status and cervical cancer screening status among African women living in the United States.

H_a5 : There is an association between perceived health status and cervical cancer screening status among African women living in the United States.

In this chapter, I present the descriptive analysis of the variables under study. Additionally, I present the results of the chi square and logistic regression analyses. The analysis shows the statistical significance of each of the independent variable to the dependent variable and I will show whether the hypothesis is retained or rejected.

Data Collection and Descriptive Analysis

The total sample size for this study was 572 African immigrant women living in the United States during the time of the study. I conducted this analysis by examining the association of seven variables of participants' family income, education level, insurance status, language of interview, age, and perceived health status to cervical cancer screening status. 28.3% ($n=162$) of the participants reported that they had the Pap smear test while 71.7% ($n=410$) did not have the test done.

The mean age for participants was 38.85 with a standard deviation of 12.32 years. The youngest age was 18 years old and the oldest was 70 years, providing for a range of 52 years. I grouped participants into three age groups: 18-30 years, 31-50 years, and 51-70 years. Majority of the participants ($n=296$) were aged between 31-50 years representing 51.7% of the respondents. 29.5% of participants ($n=169$) were aged between 31-50 years, while 18.7% ($n=107$) were aged between 51-70 years. The educational level of participants ranged from less than high school to above high school graduate. Most

participants in the study attained educational level that was above high school or GED ($n=352$) and were 61.5% of the sample. The smallest group earned less than high school and were 13.1% ($n=75$) and those who earned HS diploma or GED certificate were 25.3% ($n=145$).

I analyzed income, an ordinal variable, with three categories. The lowest value corresponded to a total family income of less than \$35,000 a year and the highest value was \$75,000 and above. Within the sample, most of the participants ($n= 295$, 51.6%) reported an income that was less than \$35,000 per year while those who earned \$75,000 were 24% ($n=137$).

An analysis of the health insurance status shows that 72% ($n=411$) of the sample had health insurance while 28% ($n=161$) admitted to having no insurance. Approximately 40% of the women indicate an excellent health ($n=227$) and approximately 51% of participants say that they enjoy a good to very good health status ($n=294$). The results show that less than 10% of all women indicate a fair or poor health status. I measured participant's acculturation by examining the language of interview. 97.7% ($n=559$) of participants conducted the interview in English, 0.2% ($n=1$) conducted the interview in English and Spanish, 1.6% ($n=9$) conducted the interview in other language(s) while 0.5% ($n=3$) conducted the interview in a language(s) that could not be ascertained.

39.7% ($n=227$) of participants perceived themselves to be in excellent health, 26.4% ($n=151$) said that their health was good, 25% ($n=143$) perceived themselves to be in good health, 6.1% ($n= 35$) said that they had fair health status, while 2.8% ($n=16$)

perceived their health to be poor. In Table 3, I present the distribution of the demographics and the variables that were examined.

Table 3
Distribution of Demographics and Personal Factors

Characteristics	Frequency	Percent
Age		
18-30	169	29.5%
31-50	296	51.7%
51-70	107	18.7%
Education		
Less than HS	75	13.1%
HS/GED Graduate	145	25.3%
Above High School	352	61.5%
Family Income		
\$0 - \$34,999	295	51.6%
\$35,000 - \$74,999	140	24.5%
\$75,000 and over	137	24.0%
Insurance Status		
Covered	411	71.9%
Not Covered	161	28.1%
Language of Interview		
English	559	97.7%
English and Spanish	1	0.2%
Other	9	1.6%
Unknown	3	0.5%
Perceived Health Status		
Excellent	227	39.7%
Very Good	151	26.4%
Good	143	25.0%
Fair	35	6.1%
Poor	16	2.8%

Results

Preliminary Analysis

I conducted the chi-square test of independence to determine the association between the receipt of Pap smear test and the independent variables of family income and education, insurance status, language of interview, age, and perceived health status. In Table 4, I present the results of the analysis of each of these variables.

Table 4

Chi-Square Test of Independence of Dependent and Independent Variables

Participants <i>N</i> = 572	Ever Had Pap Smear Test		<i>P</i> -value
	No	Yes	
No of participants	410	162	
Family Income			.095
\$0-\$34,999	49.5%	56.8%	
\$35,000-\$74,999	24.1%	25.3%	
\$75,000 and over	26.3%	17.9%	
Education by Level			.018
Less than HS	15.4%	7.4%	
HS/GED Graduate	26.1%	23.5%	
Above High School	58.5%	68.2%	
Insurance Status			.46
Covered	71.0%	74.1%	
Not Covered	29.0%	25.9%	
Age			.003
18-30	33.2%	20.4%	
31-50	47.6%	62.3%	
51-70	19.3%	17.3%	
Language of Interview			.062
English	97.1%	99.4%	
English and Spanish	0.0%	0.6%	
Other	2.2%	0.0%	
Unknown	0.7%	0.0%	
Perceived Health Status			.33
Excellent			
Very Good	37.1%	46.3%	
Good	27.8%	22.8%	
Fair	25.6%	23.5%	
Poor	6.3%	5.6%	
	3.2%	1.9%	

Socioeconomic Factors

To test Research Question 1, I utilized a chi-square test of independence to assess whether income was associated with cervical cancer screening status. I examined income in three categories. The results for participants in the \$0-\$34,999 income category show that ($n=212$) women are not expected to have the screening done, instead only ($n=203$) did not have the screening done. On the second level of \$35,000-\$74,999, ($n= 93$) participants in this category were supposed to have had the screening done and only 83 participants admitted to having had the screening. For the highest category of \$75,000 and above, while ($n=39$) women were supposed to have had the screening, only ($n=29$) participants had actually been screened for cervical cancer. Based on the results from the Pearson Chi-Square test, level of income was not significantly associated with cervical cancer screening ($p=0.95$).

An examination of the association between education level and Pap smear screening, however, showed a significant association $X^2(2, N=572) = 8.048, p=0.18$. I grouped education level into three categories; less than high school, high school or GED graduate, and above high school. 21 participants among those who had less than high school were expected to have had the Pap smear test done, however, only 12 had the test done. For those with high school or GED certificate, 41 participants were expected to have obtained the screening, however , only 38 participants had the screening done. Of those who had above high school degree, 112 participants had the screening done though the expectation was that only 100 of them would have had the screening.

I conducted logistic regression analysis between Pap smear test and education level and family income level. Using the Hosmer and Lemeshow goodness of fit test, I found that the socioeconomic factors fit the data well ($p = 0.808$). The socioeconomic factors explained 71.1% of the variation in whether participants had a Pap smear. The odds of education level predicting Pap smear test was statistically significant (OR 1.66, 95% CL: 1.24-2.22, $p = 0.001$). The odds of family income predicting the screening was also significant (OR 0.97, 95% CL: 0.94-0.99, $p = 0.005$). The full model with both socioeconomic factors was significantly different from the constant only model ($\chi^2(1, N=572) = 16.82, p < .001$). Based on these results, family income and education level are associated with cervical cancer screening among participants.

Insurance status

An examination of the association between health insurance coverage and Pap smear screening yielded results that are not significant $\chi^2(1, N=572) = .55, p = .46$ ($p > .05$), indicating that the null hypothesis is retained. The results of the logistic regression analysis revealed an odds ratio 1.172 at 95% confidence interval with lower limit at .756 and upper limit at 1.816. There is no association between health insurance coverage and Pap smear screening among African women. The results indicate that differences found between the expected and observed values are not significant, and shows that health insurance is not associated with whether women received a Pap smear screening test for early detection of cervical cancer.

When compared to those who had insurance coverage, 21% of all women had the Pap smear test when there was insurance coverage to pay for the test. Overall, just 28%

of all women had the Pap smear test whether or not they had insurance and 72% of all women did not have the procedure done even when there was insurance to cover the cost of Pap smear testing or not. The results support retaining the null hypothesis and shows that insurance coverage is not a factor that is associated with whether women decide to have a Pap smear test done.

Acculturation

I conducted a chi-square test to determine if there was an association between acculturation and cervical cancer screening among African women living in the U.S. I operationalized acculturation by the language of interview. There was no significant difference between what was expected and what was observed. Of those who interviewed in English Language, 401 participants were expected to not have had the screening done. However, only 398 participants did not receive the screening. The results of those who interviewed in other languages yielded similar results. For example, of those who interviewed in other language(s), 7 participants were expected to not have done the test, but 9 participants did not do the test. The result of the chi-square test is not statistically significant $\chi^2(3, N = 572) = 7.34, p = .062 (p > .05)$, indicating that the null hypotheses is retained. The results show that there is no association between the language of the interview and Pap smear screening. The reason women did not have screening for Pap smear was not because of a language barrier. Under the logistic regression analysis, the odds of Pap smear screening based on language of interview did not reach statistical significance (OR 0.63, 95% CL: 0.28-1.39, $p = 0.29$). Based on the results, we can

conclude that there is no genuine association between Pap smear screening and language of interview among African women.

Age

I conducted a chi-square test to determine if there is an association between women's age by group and Pap smear testing. The sample are grouped by age so that women who were from 18 to 30 years old were in Group 1, 31 to 50 years old in Group 2, and 51 and older in Group 3. The results show that of all women, 28% had the Pap smear test done ($n=162$) and the rest of the group did not have the test done. The results of the Chi-Square test were significant $\chi^2(2, N=572) = 11.59, p = .003, (p < .05)$. The results of the test indicate that the null hypothesis is rejected. The critical value required to reject the null hypothesis with two degrees of freedom and a .05 level of significance is 5.99. The results of this test ($\chi^2=11.59$) is greater than the critical value and supports the rejection of the null hypothesis.

An analysis of the cross tabulation shows that women in the 18-30 age group had less Pap smear testing than one other group. For example, the expectation is that ($n=122$) females would not have the Pap smear test and the results show that ($n=136$) did not have the Pap smear test conducted. Females who are expected to have the Pap smear test done were ($n=48$) and a smaller number ($n=33$) had the procedure done. The results show that 31% less women did not have the Pap smear procedure than was expected and the difference is significant.

When I examined the 31-50 age, the results show that more women had the Pap smear test done than is expected and is the largest group that had the Pap smear test

conducted. For instance, ($n=84$) females should have the Pap smear test done but more women ($n=101$) had the test conducted. The results show that 17 more women that are between the ages of 31-50 years old had the Pap smear procedure completed than expected. For females in the 51 and older age group, there are no large differences between what was expected and what was observed; however, the results does show that less females in the oldest age group had the procedure than was expected. The results indicate that there is an association between age group and Pap smear testing. Among those in the youngest group of 18 -30 years, 33 women had the procedure done instead of the expected 48 women. Women in the prime age of 31 – 50 years complete the Pap smear test at higher rates than women who are in the younger and older groups. The logistic regression analysis yielded results between Pap smear testing and age (OR 1.50, 95% CL: 1.13-2.0, $p = 0.006$). The result supports the rejection of the null hypothesis and further indicates that women in the 31-50 years old age group test three times as much or more than the other groups.

Perceived Health Status

I conducted a Chi-Square test to determine if there is an association between women's health status and Pap smear testing. The results of the test was not significant χ^2 (4, $N=572$) $p= .33$ ($p > .05$). The results of the test indicates that there is no association between women's health status and Pap smear testing. The findings from the results indicate that although there are some differences between the expected level and the actual level of Pap smear testing, differences are not significant. From the logistic regression analysis the odds of having Pap smear testing done based on health status was

non-significant (OR 0.84, 95% CL; 0.69-1.01, $p = 0.067$). The null hypothesis for this research question is retained.

Logistic Regression Analysis

I conducted a logistic regression analysis between pap smear test and education level, family income, age group, language of interview, insurance status and perceived health status. The model was a good fit (Hosmer & Lemeshow, chi-square = 12.280, $df = 8$, $p = .139$) The model correctly predicted whether participants would or would not have pap smear screening at 71.7%. Three of the variables, education level (OR 1.57, 95% CL: 1.165-2.13, $p = .003$), family income (OR 0.96, 95% CL: 0.93-0.98, $p = .001$), and age group (OR 1.5, 95% CL: 1.13-2.0, $p = .006$) were significant predictors of Pap smear testing. Based on the model results, the significant effect of education level, family income, and age group increased the odds of Pap smear screening among African women. However, insurance status, language of interview, and perceived health status were not significant at (OR 1.17, 95% CL: 0.76-1.8), $p = .48$; OR 0.63, 95% CL: 0.28-1.4, $p = 0.24$; and OR 0.84, 95% CL: 0.69-1.0, $p = .067$ respectively. In Table 5, I present the results of the logistic regression analysis.

Table 5

Results of Logistic Regression Analysis of Independent Variables and Pap Smear Testing

	B	S.E.	Wald	df	Sig.	Exp	95% C.I. for (B) EXP(B)	
							Lower	Upper
Edu_Lev	.455	.154	8.700	1	.003	1.577	1.165	2.134
FAMINCOME	-.043	.013	11.401	1	.001	.957	.934	.982
INSURED	.158	.224	.502	1	.479	1.172	.756	1.816
Step 1 ^a INTERVLANG	-.467	.405	1.332	1	.248	.627	.283	1.386
HEALTH	-.178	.097	3.344	1	.067	.837	.692	1.013
Age_Group	.407	.147	7.661	1	.006	1.502	1.126	2.003
Constant	-1.392	.704	3.908	1	.048	.249		

a. Variable(s) entered on step 1: Edu_Lev, FAMINCOME, INSURED, INTERVLANG, HEALTH, Age_Group.

Summary

In this chapter, I have reported the results of the analysis to investigate the association between cervical cancer screening among African immigrant women in the United States and several independent variables. I used chi-square test of independence to evaluate these relationships individually. Based on the findings, there is no association between insurance status, acculturation, perceived health status and cervical cancer screening among this population. However, the analysis showed an association between

cervical cancer screening, socioeconomic factors measured by family income and education level and age group of participants.

When examining the cervical cancer screening status of the participants, the results indicate that women between the ages of 31 to 50 years were more likely to have had the screening than women who are in the lower and higher age group. Based on the analysis, there is no difference in the proportion at which older women test or do not test for cervical cancer. The results further indicate that women who are younger than 31 years are more likely than those aged 31 to 50 years not have been tested for cervical cancer. Women who had education above the high school level were more likely to test for cervical cancer than women who had less than high school and those with high school diploma or GED certificate. In Chapter 5, I will discuss the conclusions and significance of these findings. I will provide interpretations for these findings based on literature, discuss the limitations of the study and provide recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In this quantitative cross-sectional study, I enrolled 572 African immigrant women living in the United States. The purpose of the study was to find answers to five research questions on factors affecting their cervical cancer screening status. In this chapter, I present the relevant findings of the study with detailed discussion on the extent to which the findings support the major constructs of the behavioral model for vulnerable populations. In addition, I discuss the significance of the findings, provide detailed discussion of the study limitations, and provide recommendations for future study.

The study used the behavioral model for vulnerable populations to investigate the factors that affect cervical cancer screening through the receipt of the Pap smear test among a sample of African immigrant women living in the United States. The concept of vulnerability has been explored by literature. Aday (2003) identified membership in the vulnerable population to include high-risk mothers and infants, chronically ill and disabled persons, mentally ill and disabled individuals, alcohol and substance abusers, homeless people, suicide and homicide prone persons, and abusing families. Previous researchers have determined that members of the vulnerable populations are more susceptible to harm, may have poorer access to health care, receive poorer health care quality, may not have the resources to take care of their health adequately or utilize health care services to protect or improve their health (Owosu et al., 2005; Shi & Steven, 2010).

In the current study, only 28% ($n=162$) of participants had ever had Pap smear screening while 72% ($n=410$) did not have the have the test done. These findings support other researchers who have found low cervical cancer screening rates among foreign-born women, immigrant groups, or minority groups (Akers et al., 2007; Down et al., 2007; McCarthy et al., 2010; Xu et al., 2005). The low cervical cancer screening rates among the study population indicate that while screening services are available in the United States, immigrant women from African may not be using preventive health care services and may be at risk for developing invasive cervical cancer.

Based on the behavioral model for vulnerable population, the factors that affect health care utilization among the vulnerable population include predisposing factors such as age, education, and acculturation; enabling factors such as insurance status and family income while the need factors include self-perception of health conditions (Gelberg et al., 2000). Worthington, McLeish, and Fuller-Thomson (2012) explained predisposing characteristics as the structural and demographic factors that influence an individual's need for health services; enabling characteristics as personal and community factors that facilitate or impede utilization of health services; and need characteristics as personally perceived or professionally evaluated need for health services. It is important to identify these characteristics because the rates at which individuals or groups utilize health care services ultimately affect their health outcomes.

In this study, I examined the association of the dependent variable of cervical cancer screening with the independent variables of family income, education level, insurance status, language of interview, age group, and perceived health status. The

analysis of the data using the chi-square testing revealed that age and education are significantly associated with cervical cancer screening. Education level, insurance status, language of interview, and perceived health status, however, were not significantly associated with the receipt of cervical cancer screening. Further analysis of the data using logistic regression revealed that education level and family income are significantly associated with cervical cancer screening when these two variables are examined as covariates.

Interpretation of Findings

The study revealed that only 28% ($n=162$) of participants had engaged in cervical cancer screening during the study period. As literature has revealed, women who do not receive cervical cancer screening are at greater risk for developing cervical cancer than women who engage in cervical cancer screening (Howell et al., 2009). While there have been increased efforts to make cervical cancer screening available to women, the findings from this study suggest that women continue to experience barriers in receiving the tests. Efforts must, therefore, be made to overcome these barriers.

The findings from this study should be interpreted by taking into account the demographic characteristics of participants and the way they were grouped into the study. Participants were grouped into three categories of 18 –30 years, 31-50 years, 51-70 years. The 19 years range within the two older groups may make a difference in individual's career, health, and socioeconomic characteristics. This difference may affect health choices including receipt of cervical cancer screening. Researchers have not shown any significant consistency in the manner in which women are grouped for studies that

investigate cervical screening practices. Owosu et al. (2005) used two groups of 18-44 years and 45-60 years (ranging from 15 to 22 years) to investigate race and ethnic disparities in cervical screening among 2034 participants. Alba et al. (2004), however, used four groups of 18-30 years, 31-40 years, 41-50 years, and greater than 51 years to examine the impact of English Language proficiency on receipt of Pap smear among Hispanics. Rivera, Drew, and Short (2010) grouped 20,907 participants into three groups of 21-29 years, 30-39 years, and 40-64 years, a range of 9 to 14 years.

Cervical Cancer Screening and Predisposing Factors

Age. According to the behavioral model for vulnerable population, predisposing factors such as age, education, and acculturation can predict the extent to which those identified as vulnerable use preventive health services. Previous studies have found that age was a significant determinant for receipt of screening services for cervical cancer (Lofters et al., 2011; Owosu et al., 2005). In this study, I grouped participants into three groups. The first group were women aged 18 to 30 years, the second group were women aged 31 to 50 years while the third group comprised women who were 51 years and older. Majority ($n= 296$, 51.7%) of the participants were in the second group. Women in the first group were 29.5% ($n=169$) of the participants while those in the third group were 18.7% ($n=107$) of participants.

The findings from the analysis in the current study support the behavioral model for vulnerable population by revealing that age was associated with the receipt of cervical cancer screening. In this study, I found that women aged 31-50 years were more likely to have had the Pap smear screening than women in the age bracket of 18-30 years and

women in the age bracket of 51 years and older. In the study by Owosu et al. (2005) younger women aged 18 to 44 were less likely than older women aged 45- 60 to have ever been screened for Pap smear. Lofters et al. (2011) found that women in the age bracket 35-49 were more likely than women in the age bracket 18- 34 and 50- 66 to have been screened for cervical cancer.

The findings from this study imply that age is important when developing interventions to increase Pap smear testing among African women in the United States. Women in the older age bracket of 50 and older were found to be less adherent to Pap smear screening. However, as Aker et al. (2007) suggested, cervical cancer incidence has been found to increase with age and women over the age of 65 account for 25% of cervical cancer cases and 40% of cervical cancer deaths. Efforts should be made to target the women in the older group and the younger groups when developing interventions to improve cervical cancer screening. Resources must be provided to increase Pap smear utilization among all age groups but specifically among the groups identified in this study as less likely to screen for cervical cancer. There is the need to develop age-appropriate messages that will target different age groups to increase their adherence to utilization of preventive health services.

In the current study, I found lower than expected screening rates among women aged 18 to 30 years and aged 50 to 70 years. An explanation for this may be that women in the younger age bracket may think that they are less vulnerable to adverse health conditions because they are usually in good health while women in the older group may think that they no longer need preventive services since they have passed the childbearing

age. According to Waller, Jackowska, Marlow, and Wardle (2011) younger women were more likely to have the opinion that they do not need to utilize screening services because they do not believe that they are at risk for cervical cancer and they think that their health is not a priority. In the same manner, older women above the age of 50 years may have low levels of worry about cervical cancer or low perceived risk (Waller, Jackowska et al., 2011). The lower than expected screening rates among women in the younger and lower age group is significant because according to Howell et al. (2011), women who do not have cervical cancer screening were more likely to be diagnosed with cervical cancer than those who screened regularly for cervical cancer. The findings on the cervical cancer screening status of participants in this study should be interpreted based on other demographic characteristics and participants and the possible effect on Pap smear test. Majority of participants (51.7%) are in the age bracket of 31-50 years, 61.5% have education above high school, and 51.6% earn below \$35,000. Perhaps these demographic characteristics account for why 47.6% of participants between the age of 31-50 years did not have the Pap Smear test.

Education. In the current study, I investigated the association of education by level with cervical cancer screening. It should be pointed out that findings from literature on the association of education with cervical cancer screening has been mixed. Lee and Vang (2010) and Akers et al. (2007) found significant correlation between literacy level and health screening behaviors. However, a study by Blackwell et al. (2008) found that while education was a predictor for cervical cancer screening in the United States,

education was not statistically significant for cervical cancer screening among Canadian women.

In this study, I grouped the educational level of participants into three groups: less than high school, high school and GED graduate, and above high school. Majority of the participants ($n=353$, 61.5%) had education above high school level. 145 participants (25.3%) and 75 participants (13.1%) had above high school and less than high school education respectively. The chi-square analysis revealed that education was significantly associated with the receipt of cervical cancer screening. Majority (68.2%) of those who had the Pap smear test also had education that was above the high school level. Interestingly, 58.5% of those who did not have the Pap test done also had education that was above high school. The reason why women in the lower educational level do not have cervical cancer screening may be related to poor understanding of the need for screening services and may also be related to other factors that have not been explored in this study.

The findings from the current study revealed that the highest level of education completed by participants may have some level of association with the receipt of cervical cancer screening. Community health professionals must consider these findings when developing interventions to improve adherence to cervical cancer screening recommendations. Interventions should aim at increasing awareness of screening services so that women can make informed choices about the utilization of these services. Future studies should explore knowledge of the importance of cervical cancer screening and misconceptions about the screening services among those with lower levels of literacy.

Acculturation. In the current study, I investigated the effect of language of interview on cervical cancer screening. Lee, Nguyen, and Tsui (2011) had previously operationalized language of interview as a measure of acculturation. 97.7% of the study participants ($n=411$) conducted the interview in English. The findings revealed that the language in which the survey was conducted did not significantly affect whether or not participants received cervical cancer screening. Perhaps the reason why the findings for language of interview were not significant in this study was that very few participants interviewed in languages other than English. One participant ($n=1$) interviewed in a combination of English and Spanish, nine participants interviewed in other languages, while three participants interviewed in unknown languages. The chi square analysis indicated that the reason why women did not have the screening was not associated with whether or not they interviewed in English, English and Spanish, or any other language.

Contrary to findings from literature and the constructs of the behavioral model for vulnerable population, the findings from this study did not find any significant association between acculturation and cervical cancer screening. The lack of association may be because acculturation was measured by language of interview. Some researchers have operationalized measure of acculturation as an iterative process that includes several factors. Zea, Asner-Self, Birman and Buki (2003) measured acculturation with nativity, length of residence in the United States, language competence and cultural competence. Johnson et al. (2010) assessed acculturation among Hispanics as cultural orientation toward the Mexican culture and Anglo culture.

The findings from this study may suggest that acculturation is a complex process and should take into account several factors that include length of stay in the country, age at migration, and language spoken. By expanding the concept of acculturation, researchers may be better able to predict the acculturation level of an individual and their studies may yield significant results when used to predict utilization of screening services.

Cervical Cancer Screening and Enabling Factors

Enabling factors are those factors in an individual's personal or societal environment that makes it easy or difficult for the individual to make use of health services (Worthington et al., 2012). The presence or absence of these factors may affect health choices and behaviors. The enabling factors that were explored in this study are family income and insurance status. Previous studies have found that these factors can be used to explain or predict the use of health services among vulnerable populations (Ackerson & Gretebeck, 2007; Kaplan & Inguanzo, 2011). Ackerson and Gretebeck reported that lack of insurance was associated with non-receipt of cervical cancer screening. Worthington et al. (2012) found that family income was a strong determinant of whether or not an individual is screened for cervical cancer.

Insurance. The findings from this study are surprising, as I did not find any significant association between cervical cancer screening and insurance status. In the current study, 411 (71.9%) of participants had insurance coverage but 71% of these did not have the screening done. Among those who did not have insurance coverage, 29% had the screening done. This is an indication that insurance coverage does not affect the

receipt of cervical cancer screening. Only 21% of participants in the study had the Pap smear test whether or not they had insurance.

Family Income. Family income has been found to be a determinant of utilization of preventive health care services. Individuals in higher income groups were more likely to receive preventive health services (E. Lee et al, 2008; Juon et al., 2003;). The chi-square analysis revealed a non-significant association between cervical cancer screening and family income. Those in the higher income group did not show higher propensity for cervical cancer screening than those in the lower income groups. Women in the higher income group (\$75,000 and over) represented 24% of the participants and 26.3% of those who did not have the screening done. The lowest income group (\$0-\$34,999) represented 51.6% of participants and 49.5% of those who did not have the screening done. Further analysis of the data with logistic regression, however, determined that family income is significantly associated with cervical cancer screening when examined as a covariate of education level. This finding suggests that while individual variables may not be significant, they should be examined in relation to other variables. Family income should be examined as covariates of other variables such as level of education, and age in future studies.

Cervical Cancer Screening and Need Factors

The behavioral model for vulnerable population posits that individuals use health services based on their need factors that include perceived health status. Previous studies on the association of perceived health status with utilization of screening services have been mixed. Kaplan and Inguanzo (2011) reported that uninsured individuals who

perceive their health status as poor may report more difficulties with accessing health services. Cho et al. (2010) found that individuals who reported poor health status were more likely to receive cancer screening services than those who reported that they had good health status. Fatone and Jandorf (2009), however, did not find any significant difference in the screening pattern of individuals based on their health status.

The findings from this study supported the findings by Fatone and Jandorf (2009). The chi-square analysis of the association of the cervical cancer screening and perceived health status was not significant. It should be noted that majority of participants ($n=521$) perceived themselves to be in excellent, very good or good health. 410 participants did not have the screening done probably because they did not believe that they were vulnerable for cervical cancer. The findings that the need factor did not affect cervical cancer screening is significant for those who develop health interventions to improve health utilization services. Since cervical cancer might be symptomless at the early stages, interventions should target the correlation between perceived health status and knowledge and severity of cervical cancer.

Limitations of the Study

This study has several limitations. The study assumed all the limitation of the primary NHIS study. The NHIS study collects data from no-institutionalized population in the United States. Those who are not included in the survey are those in long-term care institutions such as nursing homes, juvenile detentions, or half way houses and active duty personnel. The exclusion of these groups from the survey may have implications for the interpretation of the findings.

The study data were collected from self-reported data from respondents. The report is collected from family members but proxy respondents are acceptable for family members that are not at home. Some researchers have shown that there may be discrepancies between reported self-report and actual rates of receipt of health care services (Rausher et al., 2008). Information from respondents or their proxies may not be accurate because the respondent may be unaware of the relevant information or behavior, has forgotten it or does not wish to reveal it. Some respondents may not be forthcoming about certain behavior or may give socially acceptable responses. This may lead to over- or under-estimation of cervical cancer screening.

The language requirement for participating in the National Health Interview survey may limit the participation of foreign-born women in the survey when they are compared with U.S born women. This may result in underestimation of the differences between the screening rates among the two groups. The NHIS surveys are conducted in English and Spanish and a minimal percentage of the interviews are conducted in other languages. In this study, 97.7% of the interviews were conducted in English, 9% in English and Spanish, and 1.6% conducted in other Languages and 0.5% in other languages that are not ascertained. Since this study was conducted among immigrant women who may not have English as their first language, the imbalance in language of interview may affect the participation of these women in the study and in their responses.

Since the population in this survey are immigrants who might have had other languages apart from English as their first language, the study might have underrepresented part of the population who do speak English. Previous studies in other

populations have found that women who do not speak English may have low Pap smear testing when compared to those who speak English. Ponce et al. (2006) found that Asian women who interviewed in Mandarin, Cantonese, or Korean were less likely to receive Pap smear screening than those who interviewed in English or Spanish. Additionally, these authors found that those who interviewed in English were more likely to have received Pap smear test than those who interviewed in Spanish. Derose, Escarce, and Lurie (2007) note that limited English proficiency may limit access to health care for immigrants.

This research is limited to the original data collected by the NHIS study. Thus, the study did not investigate variables within the sample that may have influenced their decision on whether or not to have cervical cancer screening. The original NHIS data identified participants based on their nation of origin and not on their country of origin. Thus, all participants were grouped as Africans. This homogenous grouping did not provided limited information on ethnic variations among the study population. Some studies have shown that there could be heterogeneity in health behaviors within subgroups of a major ethnic group. Lee Ju, Vang, & Lundquist (2010) found a difference that was greater than 30 points in breast cancer screening behaviors of Asian American subgroups.

Recommendations

The findings from this study suggests that more research needs to be done to determine factors that affect cervical cancer screening among African immigrant women in the United States. As a first step, researchers should aggregate data for this group

based on their country of origin. Such aggregate data might reveal variations in health behaviors that can predict how individuals utilize health services. Findings from this study suggest socioeconomic factors such as education, income and age may be complex variables. Future researcher should use different age ranges to group participants. Such studies should further explore the effect of different levels of education such as “some college education” and “college graduate” on cervical cancer screening practices.

Future researchers should focus on developing culturally acceptable acculturation scale for Africans. A lot of work has been done on developing acculturation scales for other population groups especially for the Latino groups (Wallace, Pomery, Latimer, Martinez, & Salovey, 2011). The determination of reliable measure of acculturation can be useful in predicting barriers to health, health behaviors, and health outcomes. The measure of acculturation that is specific to African groups may provide understanding on its interaction with demographic, predisposing, enabling, and need factors.

Future researchers should also focus on studying factors affecting the use of preventive health services among African immigrants who do not speak or who are not fluent in English or Spanish. Robust studies that are conducted in the native languages of participants may encourage more participation by the African groups and may be more generalizable to the group.

Implications

This study is significant because it has broadened understanding on the health status and health needs of one of the minority groups in the United States. As one of the first studies to address factors that are associated with cervical cancer screening among

African immigrant women in the United States, this study has will bring about an increased interest in the study population. The findings from this study are significant in addressing cervical cancer screening among African immigrant women in the United States. The health needs of the study group and other groups must be addressed not only at the individual but also at the societal level. As stated by Shi and Stevens (2010), vulnerability to poor health is affected by the interaction of individual, community, and social factors that the individual may not have control over. Thus, society has the responsibility of actively assisting those in the vulnerable population to promote their health.

The understanding of the factors enabling or inhibiting adherence to cervical cancer screening recommendations will be useful for researchers and community health professionals. This study provides a reference for future studies by researchers for better knowledge and understanding on the risk factors for poor health outcomes among the study population and other minority groups. In addition, community health professionals can use the findings from this study to educate women on the cervical cancer and improving adherence to screening practices. Additional studies should be conducted among African women living in the United States to determine why they do not engage in cervical cancer screening.

As findings from the study has revealed, cervical cancer screening rates is low among the study population. There may, therefore, be the need to develop policies that are targeted at improving adherence to cervical cancer screening recommendations. This study suggests that the behavioral model for vulnerable population is a useful theoretical

base for investigating and predicting the utilization of health services by vulnerable groups. Future researchers should ensure that the variables that are investigated are operationalized to fit the study population.

Conclusion

This quantitative cross-sectional study investigated the factors that affect cervical cancer screening among continental African women living in the United States. A sample of 572 women aged 18 to 70 years who participated in the NHIS survey in 2000, 2005 and 2008 were recruited into the study. I hypothesized that age, education, acculturation, insurance status, family income, and perceived health needs were associated with the receipt of cervical cancer screening.

Chi square analysis determined that age group and education level were significantly associated with cervical cancer screening among the study group. This association was supported by logistic regression analysis that further indicated that education and family income are predictors of cervical cancer screening when examined as covariates. The data analysis did not find any significant association between language of interview, insurance status, and perceived health status. The study was limited by its retrospective design, the use of secondary data, and the use of self-reported data. However, the study provides a better understanding on the factors that affects the health behaviors of a minority group in the United States. Future studies should continue to explore and shed better light on the barriers to the use of preventive health services not only among the study group but among all population groups.

References

- Abotchie, P. N., & Shokar, N. (2009). Cervical cancer screening among college students in Ghana: knowledge and health beliefs. *International Journal of Gynecological Cancer, 19*(3), 412-416. doi: 10.1111/IGC.0b013e3181a1d6de
- Ackerson, K., & Gretebeck, K. (2007). Factors influencing cancer screening practices of underserved women. *Journal of American Academy of Nurse Practitioners, 19*, 591-601. doi: 10.1111/j.1745-7599.2007.00268.x
- Aday, L. U. (2003). *At risk in America. The health and health care needs of vulnerable populations in the United States*. (2nd Ed.). San Francisco, CA: Jossey Bass.
- Akers, A. Y., Newmann, S. J., & Smith, J.S. (2007). Factors underlying disparities in cervical cancer incidence, screening, and treatment in the United States. *Current Problem in Cancer, 31*, 157-181. doi: 10.1016/j.currproblcancer.2007.01.001.
- Alba, I D., Sweningson, J. M., Chandy, C., & Hubbell, F. A. (2004). Impact of English language proficiency on receipt of Pap smear among Hispanics. *Journal of General Internal Medicine, 19*, 967-970. doi: 10.1007/s11606-004-0009-9
- Amankwah, E., Ngwakongwi, E., & Quan, H. (2009). Why many visible women in Canada do not participate in cervical cancer screening. *Ethnicity and Health, 14*(4), 337-349. doi: 10.1080/13557850802699122.
- American Cancer Society. (2012). American Cancer Society Guidelines for the Early Detection of Cancer. Retrieved on July 24, 2012 from <http://www.cancer.org/Healthy/FindCancerEarly/CancerScreeningGuidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer>

- Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, *36*, 1-10.
doi:10.2307/2137284
- Aniebie, P.N., & Aniebie, U.U. (2010). Awareness and practice of cervical cancer screening among female undergraduates students in a Nigerian University. *Journal of Cancer Education*, *25*, 106-108. doi: 10.1007/s13187-009-0023z
- Anorlu, R. (2008). Cervical cancer: the sub-Saharan African perspective. *Reproductive Health Matters*, *16*(32), 41-49. doi: 10.1016/S0968-8080(08)32415-X
- Hogan, V., Amamoo, M., Anderson, A., Webb, D., Mathews, L., Rowley, D., & Culhane, J. (2012). Barriers to women's participation in inter-conceptional care: a cross-sectional analysis. *BMC Public Health*, *12*93. doi:10.1186/1471-2458-12-93.
- Baker, R. S., Bazargan, M., Bazargan-Hejazi, S., & Calderôn, J. L. (2005). Access to Vision Care in an Urban Low-Income Multiethnic Population. *Ophthalmic Epidemiology*, *12*(1), 1-12. doi:10.1080/09286580590921330
- Becker-Dreps, S., Otieno, W. A., Brewer, N. T., Agot, K., & Smith, J. S. (2010). HPV vaccine acceptability among Kenyan women. *Vaccine*, *28*, 4864-4867.
doi:10.1016/j.vaccine.2010.05.034.
- Beiki, O., Allebeck, P., N., Nordqvist, T., & Moradi, T. (2009). Cervical, endometrial and ovarian cancers among immigrants in Sweden: Importance of age at migration and duration of residence. *European Journal of Cancer*, *45*(1), 107-118.
doi:10.1016/j.ejca.2008.08.017.

- Bigby, J., Ko, L. K., Johnson, N., David, M. M. A., Ferrer, B. (2003). A community approach to addressing excess breast and cervical cancer mortality among women of African descent in Boston. *Public Health Reports*, 118(4), 338-347. PMID: PMC 1497561.
- Blackwell, D.L., Martinez, M. E., Gentleman, J. F. (2008). Women's compliance with public health guidelines for mammograms and Pap tests in Canada and the United States. *Women's Health Issues*, 18, 85-99. doi: 10.1016/j.whi.2007.10.006.
- Bowman, J. A., Sanson-Fisher, R., & Redman, S. (1997). The accuracy of self-reported Pap smear utilization. *Social Science and Medicine*, 44(7), 969-976.
- Bradley, J., Coffrey, P., Arrossi, S., Agurto, I., Bingham, A., Ilana, D....White, S.C. (2006). Women's perspectives on cervical screening and treatment in developing countries: experiences with new technologies and service delivery strategies. *Women and Health*, 43(3), 103-121. doi:10.1300/J013v43n03_06.
- Caplan, L.S., McQueen, D. V., Qualters, J. R., Leff, M., Garrett, C., & Calonge, N. (2003). Validation of self-reports of cancer screening test utilization in a managed care population. *Cancer Epidemiology Biomarkers Prevention* 12; 1182
- Centers for Disease Control and Prevention. (2009). U.S Cancer Statistics: An Interactive Atlas. Retrieved from http://apps.nccd.cdc.gov/DCPC_INCA/DCPC_INCA.aspx
- Centers for Disease Control and Prevention. (2012). Cervical cancer. Retrieved from <http://www.cdc.gov/cancer/cervical/>
- Centers for Disease Control and Prevention. (2012b). What is HPV? Retrieved from <http://www.cdc.gov/hpv/WhatIsHPV.html>

- Cho, J., Guallar, E., Hsu, Y., Shin, D., & Lee, W. (2010). A comparison of cancer screening practices in cancer survivors and in the general population: the Korean national health and nutrition examination survey (KNHANES) 2001-2007. *Cancer Causes & Control: CCC*, *21*(12), 2203-2212. doi:10.1007/s10552-010-9640-4
- Chu, K. C., Miller, B., & Springfield, S. A. (2007). Measures of racial/ethnic health disparities in cancer mortality rates and the influence of socioeconomic status. *Journal of the National Medical Association*, *99*(10), 1092-1100.
- Coker, A. L., DeSimone, C. P., Eggleston, K. S., White, A. L., & Williams, M. (2009). Ethnic Disparities in Cervical Cancer Survival Among Texas Women. *Journal Of Women's Health (15409996)*, *18*(10), 1577-1583. doi:10.1089/jwh.2008.1342
- Coker, A. L., Hopehayn, C., DeSimone, C. P., Bush, H. M., & Crofford, L. (2009). Violence against women raises risk of cervical cancer. *Journal of Women's Health*, *18*(8), 1179-1185. doi:10.1089/jwh.2008.1048.
- Corbie-Smith, G., Flagg, E. W., Doyle, J. P., & O'Brien, M. A. (2002). Influence of usual source of care on differences by race/ethnicity in the receipt of preventive services. *Journal of General Internal Medicine*, *17*, 458-464. doi: 10.1046/j.1525-1497.2002.10733.x
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. (3rd Ed.). Thousand Oaks, CA: SAGE.
- Davern, M., Blewett, L. A., Lee, B., Boudreaux, M., & King, M. L. (2012). Use of the integrated health interview series: trends in medical provider utilization (1972-

- 2008). *Epidemiologic Perspectives & Innovations*, 9(2). doi: 10.1186/1742-5573-9-2.
- Day, G., Lanier, A., Bulkow, L., Kelly, J., & Murphy, N. (2010). Cancers of the breast, uterus, ovary and cervix among Alaska Native women, 1974-2003. *International Journal Of Circumpolar Health*, 69(1), 72-86. doi: 10.3402/ijch.v69i1.17388
- Demiris, G. (2006). Principles of survey development for telemedicine applications. *Journal of Telemedicine and Telecare*, 12, 111-115.
- Denny, L. (2008). Prevention of cervical cancer. *Reproductive Health Matters*, 16(32), 18-31. doi:10.1016/S0968-8080(08)32397-0
- Denny-Smith, T., Bairan, A., & Page, M. C. (2006). A survey of female nursing students' knowledge, health beliefs, perceptions of risk, and risk behaviors regarding human papillomavirus and cervical cancer. *Journal of the American Academy of Nurse Practitioners*, 18(2), 62-69. doi:10.1111/j.1745-7599.2006.00100.x
- Department of Homeland Security. (n.d). Fiscal year 1998 statistical yearbook. Available from <http://www.dhs.gov/fiscal-year-1998-statistical-yearbook-0>
- Department of Homeland Security. (n.d(b)). Yearbook of immigration statistics: 2003. Available from <http://www.dhs.gov/yearbook-immigration-statistics-2003-0>
- Derose, P. D., Escarce, J. J. & Lurie, N. (2007). Immigrants and health care: Sources of vulnerability. *Health Affairs*, 26(5), 1258-1268. Doi: 10.1377/hithaff.26.5.1258.
- Downs, L. S., Smith, J. S., Scarinci, I., Flowers, L., & Groesbeck, P. (2008). The disparity of cervical cancer in diverse populations. *Gynecologic Oncology*, 109, S22-S30. doi:10.1016/j.ygyno.2008.01.003.

- Dubard, C. A., & Gizlice, Z. (2008). Language spoken and differences in health status, access to care, and receipt of preventive services among US Hispanics. *American Journal of Public Health, 98*(11), 2021-2028. doi: 10.2105/AJPH.2007.119008.
- Fatone, A., & Jandorf, L. (2009). Predictors of Cervical Cancer Screening Among Urban African Americans and Latinas. *American Journal Of Health Behavior, 33*(4), 416-424.
- Felix, H. C., Bronstein, J., Bursac, Z., Stewart, M. K., Foushee, H. R., & Klapow J. (2009). Family planning provider referral, facilitation behavior, and patient follow-up for abnormal Pap smears. *Public Health Reports, 124*, 733-744.
- Ferlay, J., Shin, H., Forman, D., Mathers, C., & Parkin, D. M. (2010). Estimates of worldwide burden of cancer in 2008: GLOBACAN 2008. *International Journal of Cancer, 127*(12), 2893-2917. doi: 10.1002/ijc.25516
- Fernandez, L. E. & Morales, A. (2007). Language and use of cancer screening services among border and non-border Hispanic Texas women. *Ethnicity and Health, 12*(3), 245-263. doi: 10.1080/13557850701235150.
- Gamarra, C.J., Paz, E.P.A., & Griep, R. H. (2009). Social support and cervical and breast cancer screening in Argentinean women from a rural population. *Public Health Nursing, 26*(3), 269-276. doi:10.1111/j.1525-1446.2009.00779.x
- Gelberg, L., Andersen, R. M., and Leake, B. D. (2000). The behavioral model for vulnerable populations: Application to medical care use and outcomes for homeless people. *Health Services Research, 34*(6), 1273-1302. PMID: PMC1089079.

- Gerend, M. A., & Shepherd, J. E. (2007). Using message framing to promote acceptance of the Human Papillomavirus vaccine. *Health Psychology, 26*(6), 745-752. doi: 10.1037/0278-6133.26.6.745
- Goel, S. M., Wee, C. C., McCarthy, E. P., Davis, R. B., Ngo-Metzger, Q., & Phillips, R. S. (2003). Racial and ethnic disparities in cancer screening: The importance of foreign birth as a barrier to care. *Journal of General Internal Medicine, 18*, 1028-1035. doi: 10.1111/j.1525-1497.2003.20807.x
- Guifoyle, S., Franco, R., & Gorin, S. S. (2007). Exploring older women's approaches to cervical cancer screening. *Health Care for Women International, 28*, 930-950. doi:10.1080/07399330701615358.
- Han, H., Kim, J., Lee, J., Hedlin, H., Song, H., Song, Y., & Kim, M. (2011). Interventions that increase use of Pap tests among ethnic minority women: a meta-analysis. *Psycho-Oncology, 20*(4), 341-351. doi:10.1002/pon.1754.
- Healthy People 2020. Access to health services. Available at <http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=1>
- Hoerster, K. D., Beddawi, S., Peddecord, K. M., & Ayala, G. X. (2010). Healthcare use among California farmworkers: predisposing and enabling factors. *Journal of Immigrant Minority Health, 12*, 506-512. doi. 10.1007/s10903-009-9305-0.
- Howard, M., Lytwyn, A., Lohfeld, L., Redwood-Campbell, L., Fowler, N., & Karwalajtys, T. (2009). Barriers to acceptance of self-sampling for human

- papillomavirus across ethnolinguistic groups of women. *Canadian Journal of Public Health, 100*(4), 365-369.
- Howell, L. P., Gurusinghe, S., Tabnak, F., & Sciortino, S. (2009). Cervical cancer screening in medically underserved California Latina and non-Latina women: Effect of age and regularity of Pap testing. *Cancer Detection and Prevention, 32*, 372-379. doi:10.1016/j.cdp.2009.02.001.
- Jemal, A., Bray, F., Center, M. M., Ferlay, J., Ward, E., Forman, D. (2011). Global cancer statistics. *CA: A Cancer Journal for Clinicians, 61*(1), 69-90. doi: 10.3322/caac.20107.
- Jemal, A., Center, M. M., DeSantis, C., & Ward, E. M. (2010). Global patterns of cancer incidence and mortality rates and trends. *Cancer Epidemiology Biomarkers and Prevention, 19*, 1893-1907. doi: 10.1158/1055-9965.EPI-10-0437.
- Jennings-Dozier, K., and Lawrence, D. (2000). Socioeconomic predictors of adherence to annual cervical cancer screening in minority women. *Cancer Nursing, 23*(5), 350-357. doi:10.1097/00002820-200010000-00004.
- Jensen, S. E., Pereira, D. B., Whitehead, N., Buscher, I., McCalla, J., Andrasik, M., & ... Antoni, M. H. (2012). Cognitive-behavioral stress management and psychological well-being in Hiv+ racial/ethnic minority women with human papillomavirus. *Health Psychology, doi:10.1037/a0028160*
- Ji, S. C., Chen, M., Sun, J., & Liang, W. (2010). Cultural views, English proficiency and regular cervical cancer screening among older Chinese American women. *Women's Health Issues, 20*, 272-278. doi: 10.1016/j.whi.2010.03.010.

- Johnson, K. L., Carroll, J. F., Fulda, K. G., Cardarelli, K., & Cardarelli, R. (2010).
Acculturation and self-reported health among Hispanics using a socio-behavioral
model: the North Texas Health Heart Study. *BMC Public Health, 10*(53).
doi:10.1186/1471-2458-10-53
- Johnson, P. J., Blewett, L. A., Ruggles, S., Davern, M. E., & King, M. L. (2008). Four
decades of population health data: The Integrated Interview Series as an
epidemiology resource. *Epidemiology, 19*(6), 872-875. doi:
10.1097/EDE.0b013e318187a7c5
- Juon, H., Seung-Lee, C., & Klassen, A. C. (2003). Predictors of regular Pap smears
among Korean-American women. *Preventive Medicine, 37*, 585-592.
doi:10.1016/j.ypmed.2003.09.006.
- Juon, H. S., Kim, M., Shankar, S., & Han, W. (2004). Predictors of adherence to
screening mammography among Korean American women. *Preventive Medicine,*
39(3), 474-481.
- Kagotho, N., & Jan, J. (2008). Predictors of prostate cancer screening among older
immigrant men. *Journal of National Medical Association, 100*(10), 1168-1174.
- Kaplan, M. A., & Inguanzo, M. M. (2011). The Social Implications of Health Care
Reform: Reducing Access Barriers to Health Care Services for Uninsured Hispanic
and Latino Americans in the United States. *Harvard Journal of Hispanic Policy,*
2383-92.
- Kissinger, L., Lorenzana, R., Mittl, B., Lasrado, M., Iwenofu, S., Olivo, V., & ...
Williams, A. H. (2010). Development of a Computer-Assisted Personal Interview

- Software System for Collection of Tribal Fish Consumption Data. *Risk Analysis: An International Journal*, 30(12), 1833-1841. doi:10.1111/j.1539-6924.2010.01461.x
- Lee, E. E., Fogg, L., & Menon, U. (2008). Knowledge and beliefs related to cervical cancer and screening among Korean American women. *Western Journal of Nursing Research*, 30(8), 960-974. doi:10.1177/0193945908319250.
- Lee, H. Y., & Vang, S. (2010). Barriers to cancer screening in Hmong Americans: The influence of health care accessibility, culture, and cancer literacy. *Journal of Community Health*, 35, 302-314. doi: 10.1007/s10900-010-9228-7.
- Lee, S., Nguyen, H., & Tsui, J. (2011). Interview Language: A Proxy Measure for Acculturation Among Asian Americans in a Population-Based Survey. *Journal Of Immigrant & Minority Health*, 13(2), 244-252.
doi:http://dx.doi.org.ezp.waldenulibrary.org/10.1007/s10903-009-9278-z
- Lee, Y. H., Ju, E., Vang, P. D., & Lundquist, M. (2010). Breast and cervical cancer screening among Asian American women and Latinas: Does race/ethnicity matter? *Journal of Women's Health*, 19(10), 1877-1884. doi: 10.1089/jwh.2009.1783.
- Leman, R. F., Espey, D., and Cobb, N. (2005). Invasive cervical cancer among American Indian Women in the Northern Plains, 1994-1998: incidence, mortality, and missed opportunities. *Public Health Rep.* 120(3), 283-287.
- Lofters A. K., Hwang, S. W., Moineddin, R., & Glazier, R. H. (2010). Cervical cancer screening among urban immigrants by region of origin: A population-based

cohort study. *Preventive Medicine*, 51, 509-516. doi:

10.1016/j.ypmed.2010.09.014

Maree, J. E., & Wright, S. C. D. (2011). Cervical cancer: Does our message promote screening? A pilot study in a South African context. *European Journal of Oncology Nursing*, 15, 118-123. doi: 10.1016/j.ejon.2010.06.008

McCarthy, A., Dumanovsky, T., Visvanathan, K., Kahn, A. R., & Schymura, M. J. (2010). Racial/ethnic and socioeconomic disparities in mortality among women diagnosed with cervical cancer in New York City, 1995-2006. *Cancer Causes & Control*, (10), 1645. doi:10.2307/40864273.

McDonald, J. T., & Kennedy, S. (2007). Cervical cancer screening by immigrant and minority women in Canada. *Journal of Immigrant Minority Health*, 9, 323-324. doi: 10.1007/s10903-007-9046-x.

McDonald, J., & Neily, J. (n.d). Race, Immigrant Status, and Cancer Among Women in the United States. *Journal Of Immigrant And Minority Health*, 13(1), 27-35. Accessed January 25, 2013 from EBSCOHOST.

McLay, L. A., Foufoulides, C., & Merrick, J. W. (2010). Using simulation-optimization to construct screening strategies for cervical cancer. *Health Care Management Science*, 13(4), 294-318. doi:10.1007/s10729-010-9131-x.

Minnesota Population Center and State Health Access Data Assistance Center, *Integrated Health Interview Series: Version 5.0*. Minneapolis: University of Minnesota, 2012. Retrieved from <http://www.ihis.us>

- Munoz, N., Castellsagne, X., Gonzalez, A. B., & Gissman, L. (2006). HPV in the etiology of human cancer. *Vaccine*, *24*(S3), S/1-S/310. doi: 10.1016/j.vaccine.2006.05.115
- Munro, B. (2005). *Statistical methods for health care research*. (5th Ed.). New York, NY: Lippincott Williams & Wilkins.
- National Cancer Institute. (2008). Cancer of the Cervix: What you need to know. Retrieved from <http://www.cancer.gov/cancertopics/wyntk/cervix/page3>
- National Cancer Institute. (2008). What you need to know about cervical cancer. *NIH Publication No. 08-2407*.
- National Cancer Institute. (2011). Cervical cancer: Incidence and mortality rates. Retrieved from <http://www.cancer.gov/aboutnci/servingpeople/snapshots/cervical.pdf>.
- National Cancer Institute. (n.d) . Pap tests and cervical health: a healthy habit for you. Retrieved from <http://www.cancer.gov/cancertopics/screening/pap-tests-cervical-health>
- National Cancer Institute. (n.d). Cancer advances in focus: Cervical cancer. Retrieved from <http://www.cancer.gov/cancertopics/factsheet/cancer-advances-in-focus/cervical>
- National Center for Health Statistics. (2011). *Data File Documentation, National Health Interview Survey, 2010 (machine readable file and documentation)*.
- National Center for Health Statistics (2012). About the National health interview survey. Available from http://www.cdc.gov/nchs/nhis/about_nhis.htm

- Nelson, W., Moser, R. P., Gaffey, A., & Waldron, W. (2009). Adherence to Cervical Cancer Screening Guidelines for U.S. Women Aged 25–64: Data from the 2005 Health Information National Trends Survey (HINTS). *Journal of Women's Health (15409996)*, 18(11), 1759-1768. doi:10.1089/jwh.2009.1430
- Nnodu, O., Erinosh, L., Jamda, M., Olaniyi, O., Adelaiye, R., Lawson, L.,...Zamani, A. (2010). Knowledge and attitudes towards cervical cancer and Human Papillomavirus: a Nigerian pilot study. *African Journal of Reproductive Health*, 14(1), 95-108.
- Ogunbowale, T. & Lawoyin, T. O. (2008). Cervical cancer risk factors and predictors of cervical dysplasia among women in south-west Nigeria. *Australian Journal of Rural Health*, 16, 338-342. doi: 10.1111/j.1440-1584.2008.01013x
- Owosu, G. A., Eve, S. B., Cready, C. M., Koelin, K., Trevino, F., Urrutia-Rojas, X., & Baumer, J. (2005). Race and ethnic disparities in cervical cancer screening in a safety-net system. *Maternal and Child Health*, 9(3), 285-295. doi: 10.1007/s10995-005-0004-8.
- Paskett, E. D., Tatum, C. M., Mack, D. W., Hoen, H., Case, D., L., & Velez, R. (1996). Validation of self-reported breast and cervical cancer screening tests among low-income minority women. *Cancer Epidemiology Biomarkers Prevention*, 5, 721-726.
- Ponce, N. A., Chawla, N., Babey, S. H., Gatchell, M. S., Etzioni, D. A. , Spencer, B. A., Brown, E. R., & Breen, N. (2006). Is there a language divide in Pap test use? *Medical Care*, 44(11), 998-1004. Doi.1097/01.mlr.0000233676.61237.ef

- Rauscher, G. H., Johnson, T. P., Cho, Y. I., Walk, J. A. (2008). Accuracy of self-reported cancer-screening histories: A Meta-analysis. *Cancer Epidemiology Biomarkers Prevention* 17:748-757. doi:10.1158/1055-9965.EPI-07-2629.
- Ross, J. S., Nunez-Smith, M., Forsyth, B. A., & Rosenbaum, J. R. (2008). Racial and ethnic differences in personal cervical cancer screening among post-graduate physicians: results from a cross-sectional survey. *BMC Public Health*, 8, 378. doi: 10.1186/1471-2458-8-378.
- Sanz-Barbero, S., Regidor, E., & Galindo, S. (2011). Impact of geographical origin on gynecological cancer screening in Spain. *Rev Saude Publica*, 45(6), 19-26. PMID: 22124736
- Siegel, R., Ward, E., Brawley, O., & Jemal, A. (2011). Cancer statistics, 2001: The impact of socioeconomic and racial disparities on premature cancer rates. *CA: A Cancer Journal for Clinicians*, 4(61), 212-235. doi: 10.3322/caac.20121.
- Singleton, B. A., & Straits, B. C. (2005). *Approaches to social research*. (4th Ed.). New York, NY: Oxford University Press.
- Small, La F. F. (2010). Use of mental health services among people with co-occurring disorders and other mental health co-morbidities: employing the Behavioral Model for Vulnerable Population. *Mental Health and Substance Use: Dual Diagnosis*, 3(2), 81-93.
doi: 1080/17523281003717871
- Smith, A. K., Ayanian, J. Z., Covinsky, K. E., Landon, B. E., McCarthy, E. P., Wee, C. C., Steinman, M. A. (2010). Conducting a high-value secondary dataset analysis:

An introductory guide and resources. *Journal of Internal Medicine*, 26(8), 920-929. doi:10.1007/s11606-010-1621-9.

Smith, R.A, Cokkinides V, & Brawley O. W (2008). Cancer screening in the United States, 2008: A review of current American Cancer Society guidelines and cancer screening issues. *CA: A Cancer Journal for Clinicians*. (58), 161-179. doi: 10.3322/CA.2007.0017.

Stein, J. A., Andersen, R. M., Robertson, M., & Gelberg, L. (2012). Impact of Hepatitis B and C infection on health services utilization in homeless adults: A test of Gelberg-Andersen behavioral model for vulnerable populations. *Health Psychology*, 31(1), 20-30. doi: 10.1037/a0023643

Subramanian, S., Trogon, J., Ekwueme, D. U., Gardner, G. J., Whitmire, J. T., & Rao, C. (2010). Cost of cervical cancer treatment: Implications for providing coverage to low-income women under the Medicaid Expansion for cancer care. *Women's Health Issues*, 20(6), 400-405. doi: 10.1016/j.whi.2010.07.002.

Sui, L., & Stevens, G. D. (2011). *Vulnerable populations in the United States*. United States of America: Jossey-Bass.

Suresh, K. P., & Chandrashekhara, S. (2012). Sample size estimation and power analysis for clinical research studies. *Journal of Human Reproductive Sciences*, 5, 7-13. doi:10.4103/0974-1208.97779

Tabachnick, B.G., & Fidell, L.S. (2007). *Using Multivariate Statistics, Fifth Edition*. Boston: Pearson Education, Inc.

- Tabnak, F., Müller, H., Wang, J., Zhang, W., & Howell, L. (2010). Timeliness and follow-up patterns of cervical cancer detection in a cohort of medically underserved California women. *Cancer Causes & Control: CCC*, *21*(3), 411-420. doi:10.1007/s10552-009-9473-1.
- Tung, W., Lu, M., & Cook, D. (2010). Cervical cancer screening among Taiwanese women: a transtheoretical approach. *Oncology Nursing Forum*, *37*, 4. doi: 10.1188/10.ONF.E288-E294
- Turniel-Berhalter, L. M., Finney, M. F., & Jaén, C. R. (2004). Self-report and primary care medical record documentation of mammography and Pap smear utilization among low-income women. *Journal of the National Medical Association*, *96*(12), 1632-1639. PMID: PMC2568692
- Tsui, J., Saraiya, M., Thompson, T., Dey, A., & Richardson, L. (2007). Cervical cancer screening among foreign-born women by birthplace and duration in the United States. *Journal of Women's Health*, *16*(10), 1447-1457. doi: 10.1089/jwh.2006.0279
- Tung, W.-C, Nguyen, D.H.T., Tran, D. N. (2008). Applying the transtheoretical model to cervical cancer screening in Vietnamese-American women. *International Nursing Review*, *55*, 73-80. doi:10.1111/j.1466-7657.2007.00602.x.
- U.S. Cancer Statistics Working Group. (2013). *United States Cancer Statistics: 1999–2009 Incidence and Mortality Web-based Report*. Available at: www.cdc.gov/uscs

- United States Census Bureau (2010). Place of birth of the foreign-born population: 2009. Retrieved on September 16, 2011 from <http://www.census.gov/prod/2010pubs/acsbr09-15.pdf>
- United States Census Bureau (2010b). Current population survey – March 2010 detailed table. Retrieved from <http://www.census.gov/population/foreign/data/cps2010.html>
- United States Census Bureau. 2009-2011 American Community 3-year estimates. Selected population profile in the United States. Retrieved from http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_afpt=table
- United States Preventive Services Task Force. (2011). Screening for cervical cancer. Retrieved from <http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>
- Vernon, S. W., Tiro, J. A., Vojvodic, R. W., Coan, S., Diamond, P. M., Greisinger, A., & Fernandez, M. E. (2008). Reliability and validity of a questionnaire to measure colorectal cancer screening behaviors: Does mode of survey administration matter? *Cancer Epidemiology Biomarkers Prevention*, 17(4), 758-767. doi: 10.1158/1055-9965.EPI-07-2855.
- Wallace, P. M., Pomery, E. A., Latimer, A. E., Martinez, J. L., & Salovey, P. (2010). A review of acculturation measures and their utility in studies promoting Latino health. *Hispanic journal of behavioral sciences*, 32(1), 37-54. doi: 10.1177/0739986309352341

- Waller, J., Jackowska, M., Marlow, L., & Wardle, J. (2012). Exploring age differences in reasons for nonattendance for cervical screening: a qualitative study. *BJOG: An International Journal of Obstetrics & Gynaecology*, *119*(1), 26-32.
doi: 10.1111/j.1471-0528.2011.03030.x
- Waller, J., McCaffery, K., Kitchener, H., Nazroo, J., & Wardle, J. (2007). Women's experiences of repeated HPV testing in the context of cervical cancer screening: A qualitative study. *Psycho-Oncology*, *16*, 196-204. doi: 10.1002/pon.1053.
- Waller, J., McCaffery, K., Nazroo, J., & Wardle, J. (2005). Making sense of information about HPV in cervical cancer: a qualitative study. *British Journal of Cancer*, *92*, 265-270. doi: 10.1038/sj.bjc.6602312
- WHO/ICO Information Center. (2010). Human Papillomavirus and related cancers: Summary report update. (3rd ed.). Retrieved from http://apps.who.int/hpvcentre/statistics/dynamic/ico/country_pdf/XWX.pdf?CFID=5632389&CFTOKEN=42806949
- Woltman, K. J., & Newbold, K. B. (2007). Immigrant women and cervical cancer screening uptake: a multilevel analysis. *Canadian Journal of Public Health*, *98*(6), 470-475.
- Wong, C., Jim, M., King, J., Tom-Orme, L., Henderson, J., Saraiya, M., & ... Espey, D. (2011). Impact of hysterectomy and bilateral oophorectomy prevalence on rates of cervical, uterine, and ovarian cancer among American Indian and Alaska Native women, 1999-2004. *Cancer Causes & Control: CCC*, *22*(12), 1681-1689.
doi:10.1007/s10552-011-9844-2

- World Health Organization. (2011). Sexual and reproductive health: cancer of the cervix. Retrieved on December 29, 2011 from <http://www.who.int/reproductivehealth/topics/cancers/en/>
- World Health Organization. (2012). Sexual and reproductive health: Cancer of the cervix. Retrieved from <http://www.who.int/reproductivehealth/topics/cancers/en/>
- Worthington, C., McLeish, K., & Fuller-Thomson, E. (2012). Adherence Over Time to Cervical Cancer Screening Guidelines: Insights From the Canadian National Population Health Survey. *Journal of Women's Health, 21*(2), 199-208. doi: 10.1111/j.1471-0528.2011.03030.x
- Xu, Y., Ross, C., Ryan, R., & Wang, B. (2005). Cancer risk factors among Southeast Asian American Residents of the U.S. Central Gulf Coast. *Public Health Nursing, 22*(2), 119-129. doi: 10.1111/j.0737-1209.2005.220205.x

Appendix A: Title of Appendix

Appendix A: Walden Institutional Review Board Approval

Subject : IRB Materials Approved-Mosunmola Adeyemi

Date : Tue, May 14, 2013 01:22 PM CDT

From : [IRB <IRB@waldenu.edu>](mailto:IRB@waldenu.edu)

To : [Mosunmola Adeyemi <mosunmola.adeyemi@waldenu.edu>](mailto:mosunmola.adeyemi@waldenu.edu)

CC : [Cassandra Arroyo <Cassandra.Arroyo@waldenu.edu>](mailto:Cassandra.Arroyo@waldenu.edu), [Walden University Research <research@waldenu.edu>](mailto:research@waldenu.edu)

Dear Ms. Adeyemi,

This email is to notify you that the Institutional Review Board (IRB) has approved your application for the study entitled, "Factors Affecting Cervical Cancer Screening Among African Women Living in the United States."

Your approval # is 05-14-13-0052061. You will need to reference this number in your doctoral study and in any future funding or publication submissions.

Your IRB approval expires on May 13, 2014. One month before this expiration date, you will be sent a Continuing Review Form, which must be submitted if you wish to collect data beyond the approval expiration date.

Your IRB approval is contingent upon your adherence to the exact procedures described in the final version of the IRB application document that has been submitted as of this date. If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB application, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden web site or by emailing irb@waldenu.edu:
<http://researchcenter.waldenu.edu/Application-and-General-Materials.htm>

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Please note that this letter indicates that the IRB has approved your research. You may not begin the research phase of your dissertation, however, until you have received the **Notification of Approval to Conduct Research** e-mail. Once you have received this notification by email, you may begin your data collection.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKImdiQ_3d_3d

Sincerely,
Jenny Sherer, M.Ed., CIP
Associate Director
Office of Research Ethics and Compliance
Email: irb@waldenu.edu
Fax: 626-605-0472
Phone: 612-312-1341
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100 Washington Avenue South
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Subject : Notification of Approval to Conduct Research-Mosunmola Adeyemi

Date : Tue, May 14, 2013 01:23 PM CDT

From : [IRB <IRB@waldenu.edu>](mailto:IRB@waldenu.edu)

To : [Mosunmola Adeyemi <mosunmola.adeyemi@waldenu.edu>](mailto:mosunmola.adeyemi@waldenu.edu)

CC : [Cassandra Arroyo <Cassandra.Arroyo@waldenu.edu>](mailto:Cassandra.Arroyo@waldenu.edu), [Walden University Research <research@waldenu.edu>](mailto:research@waldenu.edu)

Dear Ms. Adeyemi,

This email is to serve as your notification that Walden University has approved BOTH your dissertation proposal and your application to the Institutional Review Board. As such, you are approved by Walden University to conduct research.

Please contact the Office of Student Research Administration at research@waldenu.edu if you have any questions.

Congratulations!

Jenny Sherer
Associate Director, Office of Research Ethics and Compliance

Leilani Endicott
IRB Chair, Walden University

Curriculum Vitae

Mosunmola Adeyemi (Lizzy)

mosunmola.adeyemi@waldenu.edu**EDUCATION****Ph.D., Walden University**, Minneapolis, MN. Expected 2013. Graduating GPA 4.0

Public Health with specialization in Community Health.

M.P.H., Walden University. Minneapolis, MN. 2008. GPA 3.92**A.S., Georgia Perimeter College**, Clarkston, Georgia. 2005**M.P.A. University of Lagos**. Lagos, Nigeria. 1988**B.A (Hons). University of Ife**, Ile-Ife, Nigeria. 1980**EXPERIENCE****Atlanta Medical Center, Atlanta** , GA 2011-Present

Infection Preventionist

- Manage and coordinate infection control and prevention program in an acute care facility
- Policy development and implementation
- Project coordinator overseeing the surveillance, review, research, reporting, and investigation of infections and implementation of programs to mitigate against infections in acute care patients.

University of Phoenix, Online. 2011 to Present**Adjunct Faculty**

- Responsible for facilitating health care management classes (HSC 325) in an online setting. In this venue, the delivery and access of learning materials is via e-learning. The role of the online facilitator is to design the syllabus, provide online instructions, and facilitate the course in this environment. The facilitator is responsible for providing students with the tools for success in the work place and make the course relevant to the students' environment.

Emory Healthcare at Budd Terrace, Atlanta GA. 2010 – 2011**Education and Infection Control Coordinator**

- Provided hands-on clinical education for licensed and unlicensed employees; policy development and implementation; surveillance, research, review, and reporting of infections and infection trends in a healthcare facility; implementation of measures and programs to prevent and control infections.

DeKalb Medical Center, Decatur, GA. 2006-2011**Registered Nurse**

- Provision of nursing care across a wide-range of specialities including medical, surgical, and neurology. The role of the nurse in this setting includes education and support of patients and families to transition into home care.

Federal Ministry of Information, Lagos, Abuja, Ilorin, Osogbo, Nigeria. 1981-2000**Federal Information Officer**

- The role of the Federal Information Officer includes but is not limited to promoting federal government programs at the community levels. It also includes collaborating with several national and international agencies such as WHO, UNICEF, UNFPS< USAIDS, Planned Parenthood, to educate Nigerian citizens on making healthy life choices.

ASSOCIATED PROFESSIONAL EXPERIENCE**Practicum Student DeKalb County Board of Health 2007-2008**

- Responsible for planning, implementing and evaluating public health programs for HIV-positive patients and their partners.

CERTIFICATIONS

Certification Board of Infection Control (CIC) 2012 to present

Registered Nurse, Georgia, Texas

PROFESSIONAL AFFILIATION

Member: American Public Health Organization (APHA)

Member: Association for Professionals in Infection Control and Prevention (APIC)

Member: Georgia Infection Prevention Network (GIPN)